

**SARATTOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

**YOUR  
TOOL  
CATALOGUE** 2021/22  
**THE WAY YOU NEED IT.**

**THAT'S POWER TO PRODUCE**

\*\*\*

EUROPE-WIDE DELIVERY IN 24H

\*\*\*

EUROPE-WIDE DELIVERY IN 24H

\*\*\*

# **WITHOUT WORK, TOOLS ARE JUST THINGS**

**WE KNOW THAT DRILLS WHICH ONLY DRILL HOLES AND MILLING CUTTERS WHICH ONLY MILL GROOVES ARE THE STANDARD. ONLY WHEN THE HOLES AND GROOVES BECOME A PROFESSIONAL PRODUCT DOES THE TOOL HAVE PURPOSE.**

**THAT'S WHY WE OFFER NOT ONLY PROFESSIONAL TOOLS, BUT ALSO SERVICES THAT ALLOW YOU TO PRODUCE FASTER, BETTER AND MORE EFFICIENTLY.**

**BECAUSE SARTORIUS IS THERE FOR YOU. FOR THOSE WHO DO, WHO BUILD, WHO CREATE. NOT FOR WELL-INTENTIONED DIY PROJECTS, BUT FOR PROFESSIONAL WORK AT A PROFESSIONAL STANDARD. FOR THOSE WHO DON'T TINKER, BUT PRODUCE. FOR THOSE WHO NEED ONE THING ABOVE ALL:**

**POWER TO PRODUCE**



# ADVICE FOR THAT SOMETHING EXTRA

You don't need to know everything. You just need to know someone who does. Like SARTORIUS. We've assembled a network of experts to help you find the right tool and solution for your manufacturing needs.



## **KNOW WHAT YOU NEED: YOUR CUSTOMER ADVISOR**

When it comes to finding just the right product from the seemingly endless range of professional tools, you don't have to go it alone. Your customer adviser will support you directly on site. Our customer advisers are professionals who know what matters to you. So we offer you nothing but the solution that suits you best.



## **KNOW WHAT WORKS: OUR CUSTOMER MANAGEMENT**

Whether order acceptance, delivery inquiries or telephone advice – our specialists in customer management are happy to assist you with any issues. They will answer your questions competently and forward your queries directly to the right places.



## **KNOW HOW IT WORKS: OUR APPLICATIONS ENGINEERS**

We know that professionals understand professionals. That's why our applications engineers are always on hand to help you find the right solution. Particularly when your work becomes more specialised and standard simply won't cut it any more.

# 6

## RESONS FOR CHOOSING **SARAGO! GALAXY**

- ① Continuous process support
- ① Standardised software interface
- ① High compatibility with external systems
- ① Over 30 CAM interfaces
- ① Central database
- ① Modular system

**SARAGO! GALAXY**

# SARAGO! GALAXY

YOUR TOOLS

# ALWAYS AVAILABLE



Do you want to conserve resources? Do you want to avoid machine downtimes caused by missing tools? Do you want to ensure process reliability by networking your production processes? Do you want to be prepared for Industry 4.0?

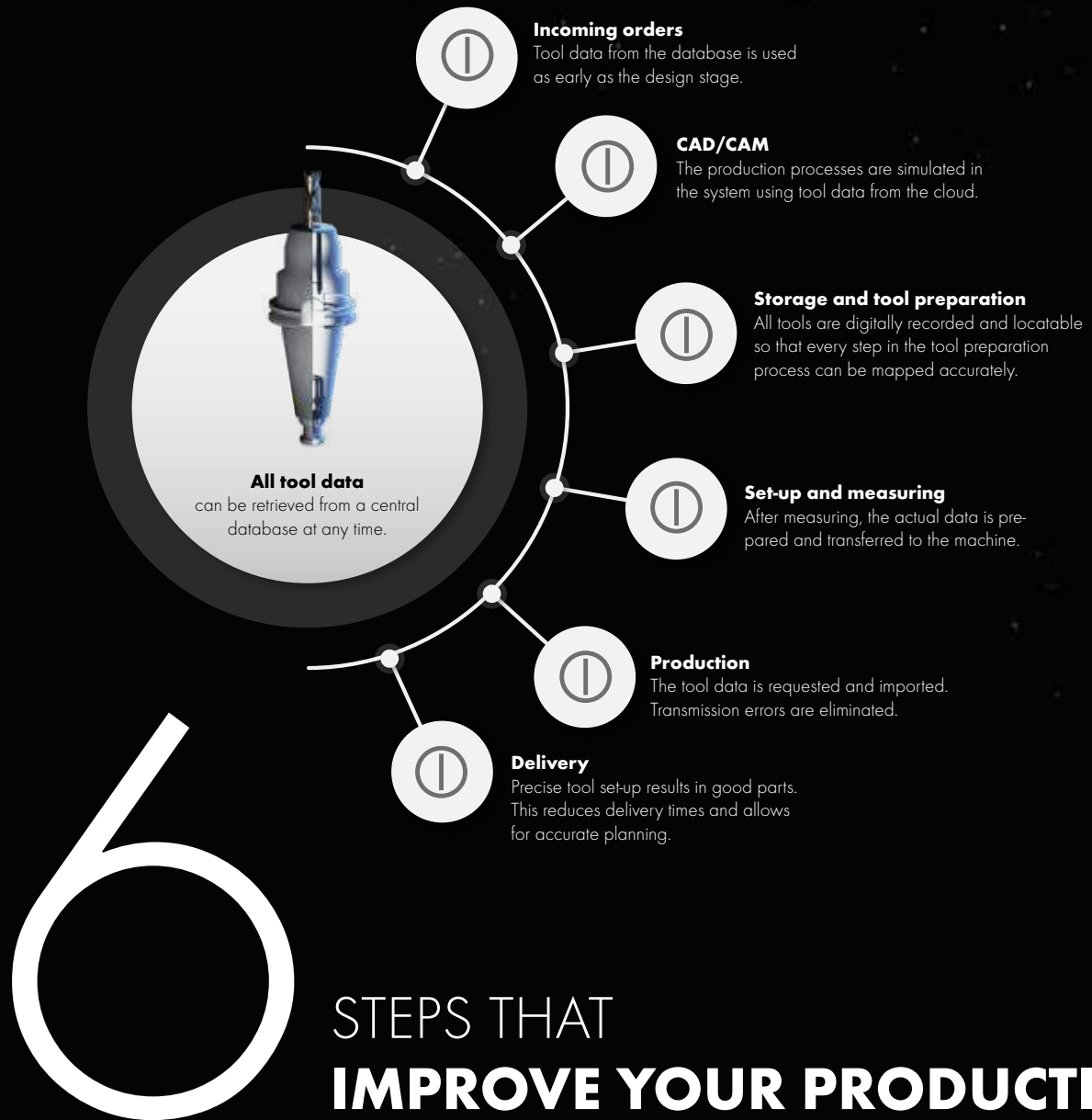
Then purchase SARAGO! GALAXY for your production hall! SARAGO! GALAXY is the clever tool dispensing system from SARATOOLS.com that allows you to have your very own 4.0 system right in your production hall. Because perfect production requires a perfect system.

**SOFTWARE**

The GALAXY SOFTWARE PACKAGE offers you everything you need for your production process. Modular in design, expandable, and easy to implement. Software you can build on. We will be happy to offer you further software solutions on request.

At SARATOOLS.com, expansion also means that our packages are always up-to-date. We expand our functionalities, reacting to new requirements with new functions. New standards are integrated into our updates. This ensures that you always have access to the latest software version.

THIS IS POWER TO PRODUCE.



Data plays an essential role in smart manufacturing. It allows you to map the entire production process in advance. This ensures the actual production process later on down the line. This is the basis of reliable modern production. THIS IS POWER TO PRODUCE.



MAKE THE BEST  
EVEN BETTER: RELIABLE  
**PRODUCTS**  
FOR  
**PROFESSIONALS**



**OUR FLYERS:  
QUICK AND STREAMLINED. EVEN IN THE PRICING**

Although the catalogue is only published once a year, the international SARTORIUS TAKEOFF! flyer is sent out on a regular basis. And while these flyers are thin, they include everything you need to know - including plenty of attractive offers for your production.

Didn't receive a TAKEOFF! flyer? Then give us a call.

# PERFECT FOR PROFESSIONALS: OUR POWER BRANDS

**BECAUSE WE ARE ALWAYS WORKING CLOSELY WITH THE PROS, WE KNOW WHAT PROFESSIONALS WANT. WHAT COULD BE BETTER THAN USING OUR WEALTH OF KNOWLEDGE TO PROVIDE YOU WITH THE PERFECT TOOL? PRECISELY. THAT'S WHY WE CREATED ATORN AND SARA – THE POWER BRANDS FROM SARTORIUS.**

## **ATORN®**

### **PERFORMANCE DEMANDS QUALITY.**

We know that professionals don't just want good tools – they want the best. That's why we created ATORN. All ATORN tools are designed based on our wealth of manufacturing expertise, so you can produce better. The ATORN brand uses only high-quality materials and first-class processing techniques – and all this at an unbeatable price-performance ratio.

ATORN offers strong products in the following areas:

- Machining
- Clamping
- Measuring and testing
- Grinding
- Hand tools
- Workshop equipment

## **SARA®**

### **SMALL NAME, BIG POWER**

Our power brand SARA offers you over 10,000 strong products for your production. Whether clamp mountings, boring bars, clamping jaws, multifunction tools or milling cutters of any type – professionals will always be satisfied with SARA.

- High quality for high standards
- Functional and reliable to use
- Outstanding price-performance ratio
- High availability
- Extensive range

# ACHIEVING MORE TOGETHER: OUR PARTNERS



## OUR PRODUCT PARTNERS

Professional products for almost any application. It's no coincidence – and it's all down to our many partners. Partners with high-quality, innovative products. Partners such as:

## WE ARE GLOBAL. BUT WE'RE LOCAL TOO. OUR DISTRIBUTION PARTNERS:

POWER TO PRODUCE is for everyone. We've built a large network of distributors across Europe – so you can always rely on SARTORIUS. Wherever you are. Wherever you work.

Bosnia and Herzegovina	Austria
Bulgaria	Poland
Denmark	Portugal
Estonia	Romania
Finland	Sweden
Greece	Switzerland
Italy	Serbia
Iceland	Slovakia
Kazakhstan	Spain
Croatia	Branch in Czech Republic
Latvia	Hungary
Lithuania	Ukraine
Macedonia	Uzbekistan
Netherlands	
Norway	





# FOR THOSE WHO ALWAYS GIVE IT THEIR ALL: OUR SERVICE

## **CALIBRATION SERVICE**

Real professionals don't work with "rough" estimates: they have to be able to rely on the precision of their measuring equipment. We therefore offer calibration of your measuring equipment to DIN EN ISO/IEC 17025:2018. We also provide free collection, fast processing, accurate logging and express delivery on request.

## **RESHARPENING AND COATING SERVICE**

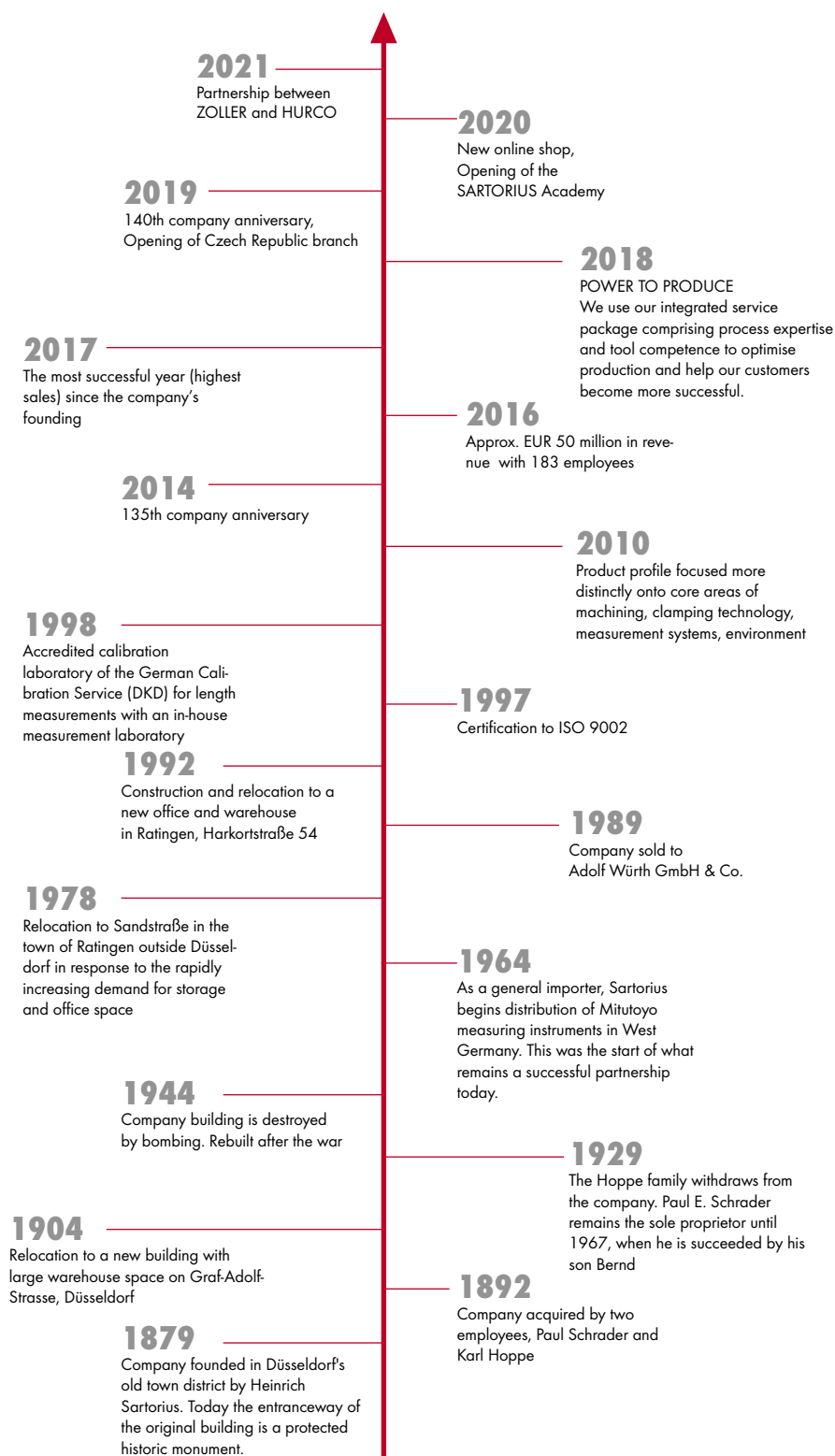
You don't always have to buy a new one: our resharpening and coating service breathes new life into your old drill bits, milling cutters, saw blades, etc. and gives them back their POWER TO PRODUCE.

## **0% FINANCING**

Finance your purchase with us – with no interest or processing fees (eligibility assumes a good credit rating). The minimum financing amount is €2,500 over a financing period of up to six months. You can pay off your SARTORIUS financing loan at any time and at no extra cost.



# POWER TO PRODUCE SINCE 1879



# FOR OPTIMISED PROCESSES AND PERFECT INFORMATION: OUR TOOLS AND **DIGITAL** **SERVICES**

**SARTORIUS IS THERE FOR EVERYONE. INCLUDING OUR ONLINE CUSTOMERS.  
OUR TOOLS AND DIGITAL SERVICES ARE A POWER UPGRADE  
FOR YOUR COMPUTER.**

## **SMALL TOOLS, HUGE SUPPORT**

Our digital tools help you to make your manufacturing processes even more efficient.

- Electronic tool selection programme
- Clamping jaws finder
- Toodle Configurator
- Product and diameter reference values for all machining products in different material groups
- Presentation of extensive product data and technical features
- Optimised search functions for products, accessories and spare parts
- Tool data for CAD / CAM systems (STEP AP214 / DIN SPEC 68874 / BMG / 3D-PDF, etc.)
- Strategic cooperation with CAD / CAM software specialists

# QUICK FIND MORE QUICKLY RECEIVE



## FIND THE RIGHT TOOL IN JUST A FEW CLICKS

- 250,000 items, 40,000 of which are in stock
- Intelligent search
- Customer-specific item number management
- Online catalogue
- Online offers and outlet area



## CONVENIENT ONLINE SHOPPING

- Best price principle
- No minimum order value
- Article availability in real time
- Availability 24/7
- Quick order via import
- One of the fastest shops in the industry
- Display of alternative items
- Approval procedure
- Transparent price comparison



## EUROPE-WIDE DELIVERY.

24 hour delivery

# EFFICIENCY

## REDEFINED



**THE SHOPPING MALL FOR ONLINE SHOPS. IN ADDITION TO OUR ONLINE SHOP, WE ARE REPRESENTED ON ALL MAJOR PROCUREMENT PLATFORMS. THE TRANSFORMATION TO DIGITAL PURCHASING HAS BEGUN.**

### **SO YOU ALWAYS HAVE AN OVERVIEW**

- Connection to merchandise management
- Procurement portals / platforms
- EDI connection
- Rapid implementation
- Process optimisation



# DIGITAL TOOL DATA FOR DOWNLOAD



## COMPUTER-AIDED MANUFACTURING

(Computer-aided manufacturing) is becoming more and more popular with a wide range of companies. The advantage of CAD/CAM software is that it replaces actual machine programming, enabling more flexible and economical production using new strategies. Information from tools and clamping devices is needed to enable an accurate simulation. The relevant data is generally provided as 3D volume models (step files), enabling the direct detection of interfering contours and potential collisions during the simulation.

- **Step files**

3D volume models of single tools or complex assemblies

- **DXF files**

in simple or detailed design  
(e.g. with or without coolant bores/chip flute)

## FOLLOW US ON

# SOCIAL MEDIA

Like, follow, subscribe – anything is possible.  
We look forward to talking with you directly.

 [facebook.com/SARATOOLScom](https://facebook.com/SARATOOLScom)

 [youtube.com/user/sartoriuswerkzeuge](https://youtube.com/user/sartoriuswerkzeuge)

 [linkedin.com/company/SARATOOLScom](https://linkedin.com/company/SARATOOLScom)

 [instagram.com/SARATOOLS\\_COM](https://instagram.com/SARATOOLS_COM)

## NEWSLETTER

Subscribe now and never miss  
an offer again.

- News
- Special offers
- Dates
- Events
- New products
- etc.

Productive and precise milling tools  
2020

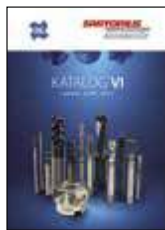
uvex

20

PFERD

# MORE THAN JUST A WAREHOUSE

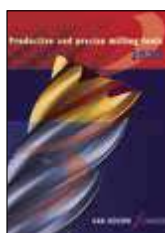
**NEED A WIDER RANGE? NO PROBLEM. ALL ARTICLES FEATURED IN THIS  
MANUFACTURER CATALOGUE CAN BE ORDERED ONLINE!  
REQUEST A FREE, ZERO-COMMITMENT MANUFACTURER CATALOGUE!**



**OSG**  
Catalogue VI  
Threading, Drilling, Milling  
1024 pages  
Art.no. 019900 0208



**HPMT**  
Machining tools  
642 pages  
Art.no. 019900 0154



**VAN HOORN**  
End milling cutters  
189 pages  
Art.no. 019900 0079



**PALBIT**  
Full Catalogue D  
816 pages  
Art.no. 019900 0317



**DÜMMEL**  
Machining tools  
479 pages  
Art.no. 019900 5529



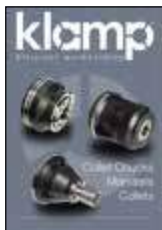
**MITUTOYO**  
D-20004  
Measuring equipment catalogue  
approx. 620 pages  
Art.no. 019900 0069



**KITAGAWA**  
NC rotary tables  
147 pages  
English version



**KITAGAWA**  
Lathe chucks  
132 pages  
English version



PDF  
  
**KITAGAWA**  
 Collet chucks  
 60 pages  
 English version




PDF  
  
**AMF**  
 Clamping technology main folder  
 925 pages  
 Art.no. 019900 5536



PDF  
  
**FAHRION**  
 Clamping technology main folder  
 144 pages



PDF  
  
**PFERD**  
 Grinding and cutting  
 763 pages  
 Art.no. 019900 0216



PDF  
  
**WIHA**  
 Hand tools  
 361 pages  
 Art.no. 019900 5548



PDF  
  
**STAHLWILLE**  
 Hand tools  
 401 pages  
 Art.no. 019900 5633



PDF  
  
**MILWAUKEE**  
 Power tools  
 127 pages  
 Art.no. 019900 5477



PDF  
  
**SIMPLAFLEX COMPACTLINE**  
 Workshop equipment  
 48 pages  
 Art.no. 019900 5577



PDF  
  
**UVEX**  
 Occupational safety  
 577 pages  
 Art.no. 019900 5470



PDF  
  
**BAUER**  
 Lift truck attachments  
 and warehouse equipment  
 176 pages  
 Art.no. 019900 5634



PDF  
  
**BEDRUNKA+HIRTH**  
 Workshop equipment  
 643 pages  
 Art.no. 019900 5628



PDF  
  
**SAUTER**  
 measurement & testing service  
 98 pages  
 Art.no. 019900 5504



PDF  
  
**KERN & SOHN**  
 scales & testing service  
 226 pages  
 Art.no. 019900 0072

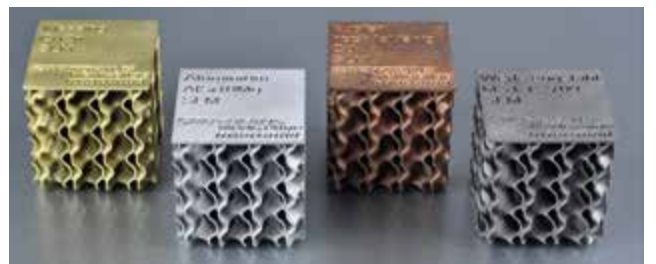
# IF YOU HAVE ADDITIVE IS A FAMILIAR WORD IN MANUFACTURING.

THAT'S POWER TO PRODUCE

## 3D OBJECTS FOR PROFESSIONAL APPLICATIONS EASY CONFIGURATION, SIMPLE ORDERING, SWIFT DELIVERY

### SARTORIUS TOOLS AND PROTIQ

Additive manufacturing is a process through which an object is formed through the gradual application of materials based on digital 3D construction data. This application-based manufacturing process differs significantly from abrasion-based manufacturing methods. For example, instead of milling a workpiece from a solid block, additive manufacturing forms components from materials layer by layer. A wide variety of materials, such as metal, plastics and composites are available. Additive manufacturing is particularly suited to the production of prototypes or small batches.







# IT'S AS SIMPLE AS THAT

Our services are not only high quality, they are also easy to use. You can access the PROTIQ-Market-Place via [www.sartorius-werkzeuge.de](http://www.sartorius-werkzeuge.de). Here you can configure individual objects or entire assemblies swiftly and conveniently. The portal also facilitates the approval process: Each customer account can include several employees with varying roles.

So you can easily configure and order high-quality 3D objects in no time:

**PROTIQ**  
A Phoenix Contact Company

## FOR EVERY REQUIREMENT THE RIGHT SOLUTION

The basis for this is our diverse range of materials and manufacturing methods, supplemented by key services in additive manufacturing, such as training, reverse engineering and finishing.

Our portal itself is loaded with functions that actively support your business processes. For example, you have access to a convenient approval and ordering process and can upload entire assemblies to the configurator.



**CREATE a 3D FILE**  
We process all conventional file formats.



**UPLOAD the file**  
Drag'n'Drop the file into the upload field - done! Your file is automatically checked and corrected if necessary.



**CONFIGURE YOUR OBJECT AND/OR ASSEMBLY**  
You can adjust the size, colour and finish. The corresponding price is displayed instantly.



**WE PRINT your ORDER**  
We manufacture quickly, with high precision and high-quality materials.



**Your ORDER IS DISPATCHED**  
We dispatch your order by express delivery on request.



# **SARTORIUS ACADEMY**

**POWERED BY ATORN**

**THAT'S POWER TO PRODUCE**

# INVESTMENT IN KNOWLEDGE FOR A PROSPEROUS FUTURE.

## FROM A VISION TO A CENTRE OF EXCELLENCE

Every journey begins with the first step. The first step towards the SARTORIUS Academy was taken in 2016. True to our POWER TO PRODUCE motto, we wanted to be closer to the customer. From pure tool merchant to experts in manufacturing. For this transformation to succeed, one aspect was paramount: the creation of our own academy. This objective was realised in conjunction with HURCO.



Founded in the USA 51 years ago, HURCO now develops and produces interactive computer controls, software and computer-aided machine tools predominantly in Europe.

And precisely two of these machines are now in the Academy. This is the perfect environment to test tools, to put innovations through their paces live on-site and to remedy user problems.
















## KNOWLEDGE TRANSFER FOR YOU, YOU AND YOU

Demographic change is no longer a nightmare scenario, but an industry-changing reality in the labour market. It requires the clever handling of newly-created options for increasing digitisation, whilst taking altered systematic processes into account. We recognise that and so do our customers. A skills shortage diminishes know-how. Meanwhile, the demands for productivity, efficiency and data processing are increasing.

In this difficult time of change it is important to take demographic development and changing job profiles into account, in addition to supplying the right tools, the corresponding knowledge and a cohesive production cycle. Specifically, this represents the intelligent networking of goods issue, through inputting the corresponding data into the machine, right up to the automatic reordering of the tools used. Or more simply: Industry 4.0. Toolmakers are increasingly becoming data technicians, which is no less challenging, but shifts responsibility onto finding solutions in manufacturing processes. All the more important is SARTORIUS Academy, where we can work on precisely these solutions.

In fact, SARTORIUS Academy is no less than a transition into a new era, in which our own employees are trained to develop solutions with customers and where Industry 4.0 can be experienced up close. Merchandise and knowledge enter into a virtually inseparable symbiotic relationship. We call this: POWER TO PRODUCE.

# INNOVATIONS AND NEW PRODUCTS




Drilling tools		Page
	Step centring drills	55
	High-performance NC drills	112
	HYP-LDS NC spotting drill	114
	Solid carbide micro drills ADO-MICRO up to 30xD	116
	HYP-HPO 3xD solid carbide high-performance drill	127
	Solid carbide high-performance drills HARD 3xD	131
	Solid carbide high-performance drill HYP-HPO 5xD	141
	Solid carbide high-performance drills HARD 5xD	149
	ADO solid carbide deep-hole drill up to 50xD	163
	Solid carbide flat drills FLAT 3xD and 5xD	166
	Solid carbide high-performance drill HIGH FEED 5xD	169
	NC spotting drill bit	175
	Replaceable head drill PXD	181

	T-A Pro drilling system up to 15xD	184
	Core and countersink drill	209
	Universal drilling and turning tool	219
	Machine tap A-SFT type E	261
	Machine forming tap S-OIL-XPf with internal cooling	294
	Vapour-treated threading die	304
	Tap wrench and threading die holder, reinforced version	312

Milling tools		Page
	Front face torus milling cutters WXS-CRE	480
	Radius milling cutter 220°	483
	PKD milling cutter	539
	Hard milling range RockTec PRO 47 to 65 HRc	580
	SARA thread milling cutters	611



# NEW










	Tangential milling cutters TGPLUS 90190	680
	High feed-rate milling cutters TETRAFEED	703
	Disc milling cutters with long inserts	737










Turning tools		Page
	ISO indexable cutting inserts, ceramic	904
	Vibration-dampened boring bars, modular	948
	Miniature boring bar holder	959
	Solid carbide miniature boring bar holder	960
	Thread tool holder with internal cooling	972
	Boring bar GROOVE system	1006
	Recess clamp mounting GROOVE modular	1007
	Multi-function tools DT-Line	1040
	Hexagonal ram Carrier tools and cutting inserts	1047




Clamping equipment		Page
	Manual chucks	1110
	Power chuck BR	1120
	Powered tools	1128
	VDI tool holder type E2S	1140
	Reducing bushes for boring bar holder	1141
	HSKT turning tool holder	1147
	Power chuck UltraGrip®	1182
	Power chuck UltraJet®	1183
	Milling cutter holders DIN 6359 with coolant bores	1207
	Shell-type milling cutter arbours, vibration-dampened	1213
	Shrink-fit technology with pyrometer coil	1226
	Covers for boreholes and screw heads with hex	1248
	5-axis combination spanner AZS	1262

# INNOVATIONS AND NEW PRODUCTS

	3-place clamping pyramid	1272
	3-way clamping tower RS-T	1273
	Centring clamp RS-Z	1274

Measuring equipment		Page
	Digital vernier callipers Digital vernier callipers IP67	1330
	Digital vernier callipers with integrated radio	1330
	Digital depth callipers with integrated radio	1347
	Digital outside micrometers Digital outside micrometer IP65	1355
	Digital outside micrometers with integrated radio	1356
	Special-purpose outside micrometers type D7	1360
	Digital dial indicator with integrated radio	1393
	Digital fast display callipers Digital fast display callipers, 3-point	1402
	Wireless data transmission U-Wave Bluetooth	1417

	i-Stick receiver for integrate wireless radio system	1417
	Measuring tables	1456
	Stereoscopic zoom microscope binocular	1474
	Inspector digital microscope	1475
	PJ-Plus profile projector	1477
	M2 data processing system	1479
	Roughness meter SJ-210/-310/-411/-412	1480
	Laser distance measuring instrument	1489
	Crane scale HFD	1492

Workshop supplies		Page
	Double open-ended spanner, ring spanner	1498
	Offset screwdriver colour-coded	1504
	Offset screwdriver 100°	1504



# NEW

	Torque limiter	1520
	LED workplace light	1546
	LED light strips	1546
	Magnetic chip broom	1547
	Pneumatic die grinder	1551
	Assembly gloves	1559
	Cut-resistant gloves	1560

	Ultrasonic cleaning equipment with heating system Elmasonic EASY	1581
	Compact Clean bio-parts washing table	1584
	Cutting wax pen	1586
	Thread cutting paste	1586
	Cutting oils	1587
	Cutting fluid concentrate	1588
	Cleaner	1589
	Chip and emulsion vacuum cleaner	1601
	Compressed air chip and wet vacuum cleaner	1601
	Compressed air industrial vacuum cleaner	1602

Safety & Environment		Page
	Monitoring system F-Monitor	1566
	Emulsion mist separator Ultra-Cleaner	1570
	Modular separator with spray system	1573
	Electrostatic oil mist separator	1574
	Mobile indoor air filters	1576

**WE'RE THERE**  
**WHEN YOU NEED US.**  
**NO MATTER WHERE:**  
**24-HOUR DELIVERY ACROSS EUROPE**

**THAT'S POWER TO PRODUCE**

**IN RATINGEN TODAY – WITH YOU TOMORROW.**  
**THIS WORKS ONLY IF ALL LOGISTICS STATIONS**  
**MESH SEAMLESSLY.**

**FAST PROCESSING, PUNCTUAL DELIVERY**

Our route-optimised, computer-aided warehouse management system efficiently manages over 40,000 items of stock for you.

In order to meet the high quality demands along the entire supply chain, we have engaged the services of parcel specialists UPS® to transport your orders.





	<p>Regrinding and coating service</p>	<p>28</p>		<p>Calibration of thread gauges</p>	<p>40</p>
<p><b>INFO</b></p>	<p>Standardised test equipment monitoring service, test and measurement equipment management</p>	<p>32</p>		<p>Calibration of plain gauges</p>	<p>41</p>
	<p>Calibration of indicating measuring instruments</p>	<p>34</p>		<p>Calibration of aids</p>	<p>43</p>
	<p>Calibration of gauge blocks</p>	<p>38</p>		<p>Repair service</p>	<p>46</p>
	<p>Calibration of material measures</p>	<p>38</p>			

Over 200,000 tools available online!  
Register online now!

[www.saratools.com](http://www.saratools.com)



### REQUESTING THE RESHARPENING BOX

On request we provide you with a resharpener box, free of charge, to ensure the safe transit of your tools.

This can be requested free of charge from our Service Team:

E-mail: [service@sartorius-werkzeuge.de](mailto:service@sartorius-werkzeuge.de)

### FREE COLLECTION

Free, next-working-day collection of your tools within Germany with our transport boxes (eco-friendly reusable packaging).

Your tools are securely delivered within 24 hours. You can also send your tools via a parcel service of your choice to:

SARTORIUS Werkzeuge GmbH & Co. KG

Resharpener service

Harkortstraße 54

40880 Ratingen

### RECEIPT OF THE TOOLS

We check the type, size and efficiency of the tools - tools that cannot be resharpened shall be returned with the rest of the tools.

### MACHINING

- Resharpener
- Coating
- Quality control
- Measurement log (on request)

Please be advised that if a cost estimate is rejected, a processing fee of €30 net will be charged.

The production areas are divided as follows:

- CNC grinding technology - shank tools
- CNC grinding technology - saw blades
- CNC grinding technology - drill bits
- Special tools and carbide saw blades
- Surface grinding technology
- Grinding rings
- Coating technology

### DELIVERY

You can expect the return of your tools - resharpened, coated and measured (optional) - within 12 working days.





## Regrinding service

- Restoration of the original grinding, with new coating on request
- Fast processing, short waiting times
- Resharpener of other tools available on request
- The prices specified are a guide only

- Additional costs are calculated based on outlay: e.g. regrinding of sets, extra-long milling cutters, trimming and re-facing



### HSS twist drill

Ø mm	Grinding €
Up to 6	1,26
Up to 8	1,62
Up to 10	2,13
Up to 12	2,95
Up to 14	4,07
Up to 16	5,-
Up to 20	7,85
Up to 25	12,75
Up to 35	15,90
Up to 45	23,30
Up to 60	32,10
Up to 70	47,10
Up to 100	69,-

0102



### Solid carbide twist drill

Ø mm	Grinding €
Up to 6	5,60
Up to 8	7,50
Up to 10	9,40
Up to 12	11,20
Up to 14	13,10
Up to 16	15,-
Up to 18	16,90
Up to 20	18,60
Up to 22	20,50
Up to 25	23,40

0102



### HSS / solid carbide end milling cutter

Ø mm	Short €
Up to 6	8,35
Up to 10	9,40
Up to 15	12,40
Up to 20	15,60
Up to 25	20,40
Up to 30	23,60
Up to 35	28,10
Up to 40	33,80
Up to 50	41,50
Up to 65	64,50
Up to 80	99,50

0102



### HSS NC spotting drill / deburring countersink

Ø mm	Grinding €
Up to 10	4,76
Up to 12	5,10
Up to 16	5,45
Up to 20	9,-
Up to 25	14,75

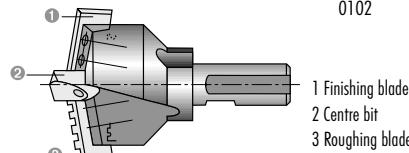
0102



### Solid carbide NC spotting drill / deburring countersink

Ø mm	Grinding €
Up to 10	9,55
Up to 12	10,20
Up to 16	10,90
Up to 20	18,-
Up to 25	29,50

0102



### Cutting edge SARADRILL

- One finishing blade and one roughing blade per set, see illustration

Ø mm	Default art.no.	€
Up to 100	042015 0100	19,30
Up to 150	042015 0150	23,50
Up to 200	042015 0200	27,20
Up to 270	042015 0270	35,80

0102

### Centre bit SARADRILL

- See illustration

Ø mm	Default art.no.	€
12	042016 0012	7,20
20	042016 0020	8,50

0102



### HSS / solid carbide radius cutter

Ø mm	Short €
Up to 6	17,90
Up to 10	18,90
Up to 15	22,40
Up to 20	26,70
Up to 25	32,50
Up to 30	38,80
Up to 35	43,70
Up to 40	53,-
Up to 50	55,50
Up to 65	84,-
Up to 80	149,-

0102



### HSS disc milling cutter

Ø mm	Up to 12 mm wide €	Up to 20 mm wide €	From 20 mm wide €
Up to 50	11,70	14,60	25,70
Up to 65	14,45	18,-	29,-
Up to 80	18,20	22,70	32,60
Up to 110	22,70	28,60	36,60
Up to 125	24,90	31,20	42,10
Up to 150	27,-	33,80	45,60
Up to 200	31,20	39,10	57,-
Up to 250	35,50	48,50	69,50
Up to 300	48,50	61,-	75,50
Up to 350	61,50	76,50	95,50

0102

0102

0102



### (Solid) carbide disc milling cutter

Ø mm	Up to 12 mm wide €	Up to 20 mm wide €	From 20 mm wide €
Up to 50	16,50	20,40	35,80
Up to 65	20,20	25,10	40,60
Up to 80	25,50	32,10	45,60
Up to 110	32,10	39,90	51,-
Up to 125	35,-	43,80	59,-
Up to 150	37,90	47,50	64,-
Up to 200	43,80	54,50	80,-
Up to 250	49,80	68,-	97,50
Up to 300	68,-	84,50	106,-
Up to 350	85,50	107,-	133,-

0102

0102

0102



### HSS plain milling cutter and shell end mill

Ø mm	Grinding €
Up to 40	16,30
Up to 50	19,10
Up to 65	22,60
Up to 75	27,30
Up to 90	30,60
Up to 110	35,80
Up to 125	40,60
Up to 150	49,-
Up to 200	59,50

0102

Continued on next page &gt;&gt;&gt;





**(Solid) carbide plain milling cutter and shell end mill**

Ø mm	Grinding €
Up to 40	22,70
Up to 50	26,50
Up to 65	31,50
Up to 75	38,30
Up to 90	42,80
Up to 110	50,-
Up to 125	57,-
Up to 150	68,50
Up to 200	84,-
0102	



**(Solid) carbide step drill**

Ø mm	Grinding €
Up to 10	13,10
Up to 20	22,20
Up to 30	28,60
Up to 40	36,90
Up to 50	47,50
Up to 60	64,-
Up to 70	83,50
0102	



**HSS countersink and deburring countersink**

Ø mm	Grinding €
Up to 10	4,94
Up to 16	5,95
Up to 21	6,60
Up to 26	9,15
Up to 35	10,70
Up to 45	13,70
Up to 60	17,20
Up to 70	20,50
Up to 80	24,50
Up to 100	28,60
0102	



**(Solid) carbide countersink and deburring countersink**

Ø mm	Grinding €
Up to 10	9,85
Up to 16	11,95
Up to 21	13,25
Up to 26	18,30
Up to 35	21,40
Up to 45	27,60
Up to 60	34,40
Up to 70	41,20
Up to 80	49,40
Up to 100	57,50
0102	



**HSS hand reamers**

Ø mm	Grinding €
Up to 10	4,41
Up to 15	7,65
Up to 20	9,85
Up to 25	12,25
Up to 30	14,45
Up to 35	16,70
Up to 40	20,70
Up to 45	23,30
Up to 50	28,-
Up to 60	33,80
Up to 80	45,-
Up to 100	57,50
0102	



**Solid carbide reamers**

Ø mm	Grinding €
Up to 10	6,60
Up to 15	11,40
Up to 20	14,75
Up to 25	18,30
Up to 30	21,70
Up to 35	24,90
Up to 40	31,10
Up to 45	34,90
Up to 50	41,80
Up to 60	50,50
Up to 80	67,50
Up to 100	86,-
0102	



**HSS hand tap and machine tap**

Ø mm	Grinding €
Up to 10	3,23
Up to 15	5,45
Up to 20	8,15
Up to 25	11,95
Up to 30	16,30
Up to 40	21,80
Up to 50	26,80
Up to 60	32,50
Up to 70	40,10
0102	



**Solid carbide machine tap**

Ø mm	Grinding €
Up to 10	4,94
Up to 15	8,15
Up to 20	12,25
Up to 25	17,90
Up to 30	24,50
Up to 40	32,70
Up to 50	40,30
Up to 60	48,80
Up to 70	60,-
0102	



**HSS centre punch centring points**

Shank	Fixed pointed tip €	Rotating pointed tip €
MT 2	12,40	16,20
MT3	17,90	23,30
MT 4	23,90	30,90
MT 5	37,70	49,10
MT 6	68,50	89,-
0102		0102



**Carbide centre punch centring point**

Shank	Fixed pointed tip €	Rotating pointed tip €
MT 2	18,90	37,70
MT3	27,10	54,50
MT 4	35,80	72,-
MT 5	52,50	105,-
MT 6	94,-	188,-
0102		0102



**HSS metal circular saw blades**

Ø mm	Grinding €
Up to 75	6,15
Up to 110	7,10
Up to 150	8,15
Up to 175	9,-
Up to 200	10,35
Up to 250	12,10
Up to 275	14,30
Up to 300	15,90
Up to 325	17,20
Up to 350	19,50
Up to 400	22,40
Up to 500	26,40
0102	



**Solid carbide circular saw blades**

Ø mm	Grinding €
Up to 50	20,70
Up to 65	27,30
Up to 80	40,90
Up to 100	50,50
Up to 125	81,-
Up to 150	97,-
Up to 160	116,-
Up to 200	210,-
0102	



## Coating service

- Coating and recoating to maintain or improve the performance of machining tools
- Small layer thicknesses in the  $\mu$  range provide significantly better wear protection
- Fast processing, short waiting times
- Other types of coating and coatings for other tools available on request



### Shank tool

Ø mm	TiN €	TiCN €	TiAlN €	CrN / Multi Cut €	Ultra+ €	Ultra-Si €
Up to 6	2,21	2,21	2,67	2,67	3,36	3,59
Up to 10	3,02	3,48	3,83	3,83	4,76	5,30
Up to 12	3,59	4,06	4,40	4,40	5,45	6,-
Up to 14	4,17	4,53	4,99	4,99	6,15	6,85
Up to 16	5,80	6,-	6,75	6,75	8,35	9,15
Up to 18	8,55	9,60	10,65	10,65	13,35	14,60
Up to 20	8,55	10,30	11,35	11,35	14,15	15,70
Up to 25	14,05	15,20	16,20	16,20	20,30	22,40
Up to 30	17,90	21,30	24,40	24,40	30,50	
Up to 40	24,60	30,90	37,40	37,40	46,80	
Up to 50	34,10	46,50	47,70	47,70	56,-	
Up to 60		51,-	55,-			
	0102	0102	0102	0102	0102	0102

### Countersink

Ø mm	TiN €	TiCN €	TiAlN €	CrN / Multi Cut €	Ultra+ €
Up to 6	2,32	2,79	3,13	3,13	4,06
Up to 8	3,13	3,59	4,17	4,17	5,30
Up to 10	4,63	5,45	6,40	6,40	7,90
Up to 15	6,95	8,20	9,60	9,60	11,95
Up to 18	8,45	10,10	11,70	11,70	14,60
Up to 20	9,15	10,90	12,75	12,75	16,-
Up to 25	10,-	11,80	13,95	13,95	17,40
Up to 31	10,65	12,75	15,-	15,-	18,60
Up to 36	11,35	13,65	15,90	15,90	19,90
Up to 41	12,20	14,50	16,90	16,90	21,20
Up to 48	13,80	16,40	19,10	19,10	23,90
Up to 51	18,30	22,10	25,60	25,60	32,10
	0102	0102	0102	0102	0102

### Disc milling cutter

Ø mm	TiN €	TiCN €	TiAlN €	CrN / Multi Cut €	Ultra+ €
Up to 50	10,10	11,95	13,95	13,95	17,60
Up to 80	18,-	21,40	25,-	25,-	31,30
Up to 100	22,90	27,40	32,10	32,10	39,90
Up to 125	28,40	33,90	39,60	39,60	49,50
Up to 150	33,70	40,30	47,-	47,-	58,50
Up to 180	39,20	47,-	55,-	55,-	68,50
Up to 210	44,50	53,50	62,50	62,50	78,-
Up to 250	49,70	59,50	69,50	69,50	87,-
	0102	0102	0102	0102	0102

### Cutting edge SARADRILL

- Per set

Ø mm	TiN €
Up to 60	5,35
Up to 85	6,05
Up to 110	11,65
Up to 150	13,45
Up to 200	16,20
Up to 270	21,40
	0102

### Shell end mill

Ø mm	TiN €	TiCN €	TiAlN €	CrN / Multi Cut €	Ultra+ €
Up to 30	7,55	8,70	9,90	9,90	12,30
Up to 40	10,30	11,60	12,75	12,75	15,90
Up to 50	15,-	16,90	19,-	19,-	23,80
Up to 63	17,80	20,70	23,80	23,80	29,50
Up to 80	27,30	32,30	37,-	37,-	46,20
Up to 100	38,80	44,-	49,30	49,30	62,-
Up to 125	54,-	67,50	80,50	80,50	100,-
Up to 150	64,-	79,50	95,50	95,50	119,-
	0102	0102	0102	0102	0102

### Indexable inserts

Number	TiN €	TiCN €	TiAlN €	CrN / Multi Cut €	Ultra+ €	Ultra-Si €
Price per unit	2,32	2,32	2,32	2,32	2,90	3,36
From 10 units	1,51	1,51	1,51	1,51	1,85	2,08
From 50 units	1,16	1,16	1,16	1,16	1,51	1,74
From 100 units	0,92	0,92	0,92	0,92	1,05	1,28
	0102	0102	0102	0102	0102	0102

### Saw blade

Ø mm	TiN €	TiCN €	TiAlN €	CrN / Multi Cut €	Ultra+ €
Up to 50	7,20	8,20	9,70	9,70	12,20
Up to 60	8,55	9,90	11,70	11,70	14,60
Up to 70	10,-	11,60	13,65	13,65	17,-
bis 80	11,35	13,20	15,50	15,50	19,40
Up to 90	12,85	14,80	17,60	17,60	21,90
Up to 100	14,25	16,40	19,40	19,40	24,40
Up to 125	17,90	20,50	24,40	24,40	30,40
Up to 150	21,30	24,70	29,20	29,20	36,50
Up to 200	28,40	32,90	38,90	38,90	48,60
Up to 250	35,40	41,10	48,60	48,60	61,-
Up to 275	39,10	45,30	53,50	53,50	68,50
Up to 300	42,50	49,20	58,-	58,-	73,-
Up to 350	49,50	57,50	68,-	68,-	85,-
Up to 400	57,-	65,50	78,-	78,-	97,-
Up to 450	64,-	74,-	87,-	87,-	109,-
	0102	0102	0102	0102	0102

**Standardised test equipment monitoring service**

**INFO**

**ONE CONTACT – EVERYTHING FROM A SINGLE SOURCE**

Melutec Metrology GmbH is a calibration laboratory confirmed and accredited by DAKKS "Deutsche Akkreditierungsstelle GmbH" with respect to dimensional measurands (length, coordinate metrology, angles), mechanical measurands (torque, balances) and thermodynamic measurands (temperature and relative humidity) in accordance with DIN EN ISO/IEC 17025:2018. Melutec offers

comprehensive consulting services for test equipment monitoring and calibration of all physical quantities and measuring units. We can repair and service test equipment on request. Melutec also calibrates stationary test equipment on site. Significant, internationally recognised test certificates and short turnaround times round out our range of services.

**DAKKS CALIBRATION SERVICES FOR THE FOLLOWING ELEMENTS:**

**Hand-held measuring equipment**

- Vernier calliper
- Outside micrometers
- Setting gauges
- Built-in, special and depth micrometers
- Inside measuring instruments (Subito, splayed sensors and bore gauge)
- Inside micrometers with 2-point and 3-line contact
- Height callipers
- Thread measuring wires
- Thread measuring inserts
- Length measuring devices up to 5000 mm
- Height meters
- Electronic displacement transducer, inductive probe

**Gauge blocks and gauges**

- Gauge blocks
- Thread gauges (all measurement methods)
- Test pins
- Limit plug gauges
- Precision dial gap gauge
- Ring gauges

**FACTORY CALIBRATION FOR TEST EQUIPMENT**

- All DAKKS calibration articles
- Diameter
- Length
- Thread
- Form
- Electrical measuring instruments

**Dial indicators**

- Dial indicators
- Dial indicator measuring devices
- Lever dial indicators
- Precision dial comparator

**Aids**

- Straightedges
- Gauge block measuring devices
- Tape measures
- Graduated scales
- Tape measuring devices up to 5000 mm
- Angle (bevel edge, framing and try square)
- Feeler and radius gauges
- Gap gauges
- Granite surface plate

**Temperature and mass**

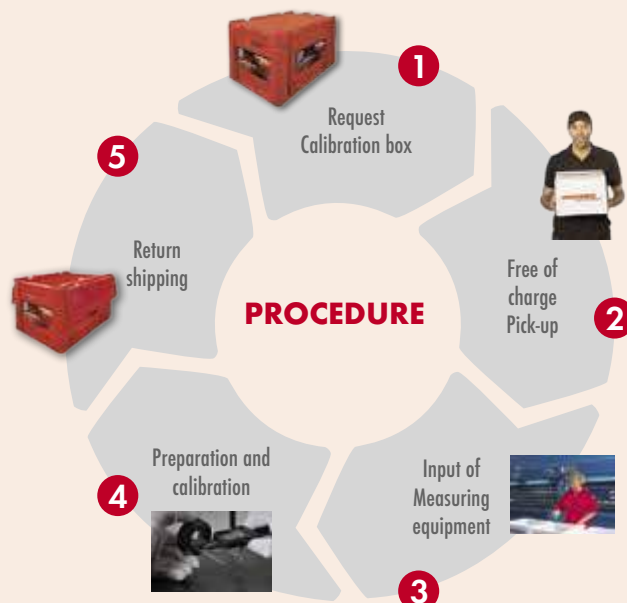
- Scales
- Thermometer
- Hygrometer
- Moisture meter

**Optics**

- Measuring microscopes
- Measuring projectors

**Other**

- Roundness
- Straightness
- Cylindrical shape
- Parallelism
- Torque wrench
- Reference spheres for coordinate measuring devices
- Flatness and planarity standards
- Stylus
- Electronic measuring probe
- Test cylinder
- Dumbbell ball calliper for thread measurement
- Magnification standard (Flick)
- Planar and coplanar test glasses



**FREE COLLECTION**

Free, next-working-day collection of measuring equipment within Germany with our calibration box (eco-friendly reusable packaging). Measuring equipment securely delivered within 24 hours.

Measuring equipment can also be sent in using a courier service:

SARTORIUS Werkzeuge GmbH & Co. KG  
 Calibration service  
 Harkortstraße 54  
 40880 Ratingen, Germany

**PROCESS SEQUENCE**

Preparation	Calibration	Post-processing service	Complete service
<ul style="list-style-type: none"> <li>• Cleaning</li> <li>• Tempering</li> </ul>	<ul style="list-style-type: none"> <li>• Adjusting test equipment</li> <li>• Standardised calibration in accordance with VDI/VDE/DGQ, DKD guidelines, national and international standards, manufacturer's specifications and internal regulations</li> <li>• With inspection plate/engraving on request</li> </ul>	<ul style="list-style-type: none"> <li>• Preservation with oil</li> <li>• Hot dipping (on request)</li> <li>• Packaging</li> </ul>	<ul style="list-style-type: none"> <li>• Repair on request</li> </ul>

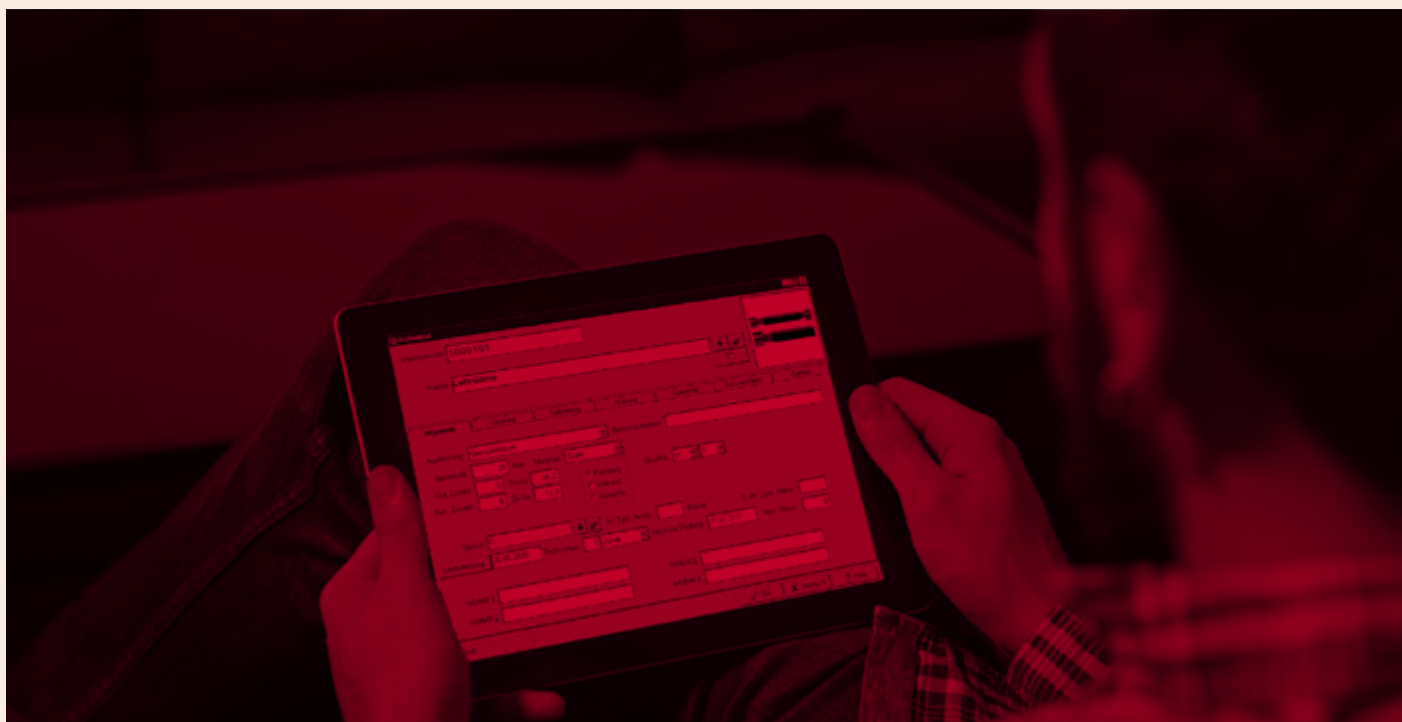


### PROCAL-PMV

ProCal-PMV software enables a large number of daily work steps to be carried out automatically, where previously this would have required considerable personnel, time and financial resources. The ProCal-PMV test equipment management system enables automatic electronic data reconciliation between the customer and the calibration laboratory. Test equipment data is automatically selected and extracted. When extracting data to the calibration laboratory, the test equipment statuses are set automatically. When loading data from the calibration laboratory, all dependent histories are automatically updated and calibration data is added.

### ADVANTAGES

- Access over any internet connection
- no installation of software on your computers
- Fulfils all standard requirements, such as ISO 9001, IATF 16949, DIN EN ISO/IEC 17025
- Various filter options to narrow down detailed data for test equipment management
- Cost savings by defining inspection intervals (e.g. 1 year, 6 months, 78 days)
- The test equipment history provides information about the condition of the test equipment
- various management options regarding allocation of information such as cost centre, place of use, etc.



## Calibration of indicating measuring instruments

- **DAkkS calibration:** Calibration and documentation in accordance with „Deutscher Akkreditierungstelle GmbH“
- **Factory calibration:** Testing and documentation in compliance with VDI/VDE/DGQ 2618, in accordance with the manufacturer's instructions or in accordance with national or international guidelines
- Unless otherwise specified in the order, an accredited calibration is performed as standard.

**DAkkS calibration  
including  
DAkkS plate**

### calipers and depth bars according to DIN 862

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Vernier callipers Sheet 9.1 and depth callipers Sheet 9.2

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 200	<b>072008</b> W001 10,-	<b>072008</b> D001 14,-
Up to 300	072008 W002 15,-	072008 D002 19,-
Up to 600	072008 W003 27,-	072008 D003 31,-
Up to 750	072008 W004 30,-	072008 D004 34,-
Up to 1000	072008 W005 44,-	072008 D005 48,-
Up to 2000	072008 W006 164,-	072008 D006 168,-
Up to 3000	072008 W901 238,-	
	0103	0103

### Height callipers and marking-out instruments

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 9.3

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 300	<b>071270</b> W001 28,-	<b>071270</b> D001 32,-
Up to 600	071270 W002 36,-	071270 D002 40,-
Up to 1000	071270 W003 61,-	071270 D003 65,-
Up to 2000	071270 W004 146,-	071270 D004 150,-
	0103	0103

### Height meters

- Calibration and documentation according to VDI/VDE/DGQ 2618 Sheet 16.1 or the manufacturer's instructions, e.g. MITUTOYO-Linear-Height, Microhite, Trimos, Digimahr, Mauser
- **Please note:** The original probe is required for calibration!

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 300	<b>071280</b> W001 210,-	<b>071280</b> D001 284,-
Up to 600	071280 W002 285,-	071280 D002 384,-
Up to 1000	071280 W003 435,-	071280 D003 584,-
	0103	0103

### Precision dial comparator

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 11.2

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 3	<b>071240</b> W001 15,-	<b>071240</b> D001 19,-
	0103	0103

### Lever dial indicators

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 11.3

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 1	<b>071250</b> W001 14,-	<b>071250</b> D001 18,-
Up to 3	071250 W002 20,-	071250 D002 24,-
	0103	0103

### Dial indicators with analogue or digital readings

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 11.1

Measuring span mm	Factory calibration art.no. €	DAkkS calibration art.no. €
3	<b>073009</b> W001 12,-	<b>073009</b> D001 16,-
5	073009 W002 14,-	073009 D002 18,-
10	073009 W003 15,-	073009 D003 19,-
25.4	073009 W004 18,-	073009 D004 22,-
30	073009 W005 20,-	073009 D005 24,-
50.8	073009 W006 32,-	073009 D006 36,-
100	073009 W007 55,-	073009 D007 59,-
	0103	0103





**Outside micrometers with spindle adjusting range up to 25 mm**

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 10.1
- In the case of outside micrometers with replaceable inserts, the inserts are calibrated separately. These are calculated in the same way as calibration of an outside micrometer.

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 25	070160 W001 14,-	070160 D001 18,-
Up to 100	070160 W002 16,-	070160 D002 20,-
Up to 300	070160 W003 25,-	070160 D003 29,-
Up to 500	070160 W004 30,-	070160 D004 34,-
Up to 1000	070160 W005 138,-	070160 D005 142,-
Up to 1500	070160 W901 158,-	
Up to 2000	070160 W902 188,-	
	0103	0103

**Setting gauges for outside micrometers**

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 4.4

Nominal dimension mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 50	075033 W001 9,-	075033 D001 13,-
Up to 100	075033 W002 12,-	075033 D002 16,-
Up to 200	075033 W003 17,-	075033 D003 21,-
Up to 300	075033 W004 25,-	075033 D004 29,-
Up to 400	075033 W005 32,-	075033 D005 36,-
Up to 500	075033 W006 46,-	075033 D006 50,-
	0103	0103

**Inside micrometers, 2-point contacts according to DIN 863, Part 4, types A1, A2**

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 10.7
- Spindle adjusting range up to 25 mm
- In the case of inside micrometers with extensions, the extensions are calibrated separately. These are calculated in the same way as calibration of an inside micrometer.

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 200	072003 W001 30,-	072003 D001 34,-
Up to 500	072003 W002 58,-	072003 D002 62,-
Up to 1000	072003 W902 78,-	
	0103	0103

**Inside micrometers with 3-point contact – DIN 863, Part 4, Form C1 and C2**

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 10.8
- Spindle adjusting range up to 25 mm

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 25	072002 W001 18,-	072002 D001 22,-
Up to 100	072002 W002 25,-	072002 D002 29,-
Up to 250	072002 W003 35,-	072002 D003 39,-
	0103	0103

**Depth micrometers according to DIN 863, Part 2**

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 10.5
- Spindle adjusting range up to 25 mm
- In the case of depth micrometers with extensions, the extensions are calibrated separately. These are calculated in the same way as calibration of a depth micrometer.

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 100	074009 W001 20,-	074009 D001 24,-
Up to 200	074009 W002 30,-	074009 D002 34,-
Up to 500	074009 W003 58,-	074009 D003 62,-
	0103	0103

**Built-in micrometers with analogue or digital readings**

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 10.4

Measurement range mm	Factory calibration art.no. €	DAkkS calibration art.no. €
0 to 25	071230 W001 44,-	071230 D001 48,-
0 to 50	071230 W002 52,-	071230 D002 56,-
	0103	0103



Continued on next page &gt;&gt;&gt;

### Gap gauges with dial indicators or indicating calipers

- Calibration and documentation of measuring surface parallelism and planarity as well as of repeatability according to the manufacturer's instructions
- Testing costs for the indicating measuring instrument are charged separately.

Measurement range mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
Up to 100	074008 W001	58,-	074008 D001	62,-
Up to 200	074008 W002	75,-	074008 D002	79,-
Up to 300	074008 W901	96,-		
Up to 400	074008 W902	125,-		
Up to 500	074008 W903	156,-		
Up to 600	074008 W904	189,-		
	0103		0103	



### Indicating caliper micrometer gauge according to DIN 863, Part 3

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 10.3

Measurement range mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
Up to 25	070170 W001	28,-	070170 D001	32,-
Up to 100	070170 W002	36,-	070170 D002	40,-
Up to 200	070170 W003	58,-	070170 D003	62,-
	0103		0103	



### External fast display calliper

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 12.1/13.1

Measurement range mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
Up to 100	072007 W001	18,-	072007 D001	22,-
Up to 200	072007 W002	22,-	072007 D002	26,-
Up to 500	072007 W003	36,-	072007 D003	40,-
	0103		0103	



### Internal fast display calliper

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 13.1

Measurement range mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
3 to 100	072006 W001	18,-	072006 D001	22,-
Up to 200	072006 W002	22,-	072006 D002	26,-
	0103		0103	



### Thickness gauge

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 12.1
- Calibration costs for the indicating measuring instrument are charged separately.

Measurement range mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
Up to 200	071220 W001	58,-	071220 D001	62,-
	0103		0103	



### Internal precision instruments with dial indicators or indicating calipers

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 13.2
- **DAkkS calibration:** Subtits up to 300 mm, bore gauge up to 100 mm, probe heads/expanding mandrels 1.75 to 25 mm
- Calibration costs for the indicating measuring instrument are charged separately.

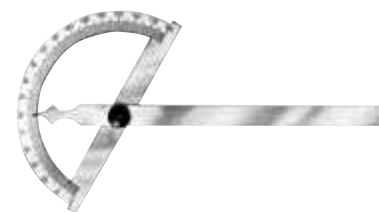
Measurement range mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
All	075011 W001	36,-	075011 D001	40,-
	0103		0103	



**Graduator with division scale**

- Calibration and documentation in accordance with the manufacturer's instructions

Design	Factory calibration art.no. €	DAkkS calibration art.no. €
0° to 180°	<b>075006</b> W001 28,-	<b>075006</b> D001 32,-
Electronic "goniometer"	075006 W002 89,-	075006 D002 93,-
	0103	0103

**Goniometer with mechanical, optical or digital readings**

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 7.2

Design	Factory calibration art.no. €	DAkkS calibration art.no. €
0° to 360°	<b>075007</b> W001 38,-	<b>075007</b> D001 42,-
Additional line gauge	075007 W002 24,-	075007 D002 28,-
	0103	0103

**Inclinometers, horizontal and vertical (spirit levels, frame spirit levels)**

- Calibration and documentation in accordance with the manufacturer's instructions
- Other designs and accuracies on request

Sensitivity mm/m	Factory calibration art.no. €	DAkkS calibration art.no. €
Up to 0.005	<b>075008</b> W001 348,-	<b>075008</b> D001 352,-
Up to 0.01	075008 W002 248,-	075008 D002 252,-
Up to 0.02	075008 W003 73,60	075008 D003 96,-
> 0.02 to 0.05	075008 W004 61,50	075008 D004 86,-
> 0.05 to 0.10	075008 W005 57,60	075008 D005 76,-
> 0.10 to 0.40	075008 W006 51,20	075008 D006 68,-
	0103	0103

**Roughness meters, portable design**

- Calibration and documentation in compliance with DKD directives and the manufacturer's instructions
- Testing of stationary surface roughness testers at the installation site on request

Design	Factory calibration art.no. €
One probe	<b>079942</b> W901 115,-
	0103

**Roughness or groove standards for surface roughness testing equipment**

- Calibration and documentation in compliance with DKD directives
- Type C: Standard geometries
- Type D: Standard roughness

Type	Factory calibration standard roughness art.no. €	DAkkS calibration art.no. €
C + D	<b>073103</b> W158 140,-	DAkkS calibration on request
	0103	



## Calibration of gauge blocks

- Depending on user requirements, we offer different scopes of calibration for gauge blocks:

**Factory calibration:** Calibration and documentation in compliance with VDI/VDE/DGQ 2618 Sheet 3.1 Option 5.3.3

**DAkkS calibration:** Calibration and documentation in compliance with DKD directives 4-3 Sheet 3.1 Option 5.3.2

**DAkkS calibration  
including  
DAkkS plate**

### In accordance with DIN EN ISO 3650, acc. 0, 1 or 2

- Steel, carbide or ceramics
- Individual gauge blocks > 1000 mm, available on request
- Intermediate dimensions are special dimensions that are not usually available in standard sets (e.g. 5.1 mm or 50.45 mm).

Nominal dimension mm	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
Up to 100	<b>073103</b> W084	8,-	<b>075017</b> D010	14,-
Up to 200	073103 W146	44,-	075017 D001	59,-
Up to 300	073103 W147	48,-	075017 D002	64,-
Up to 400	073103 W148	60,-	075017 D003	79,-
Up to 500	073103 W149	72,-	075017 D004	94,-
Up to 600	073103 W150	94,-	075017 D006	168,-
Up to 700	073103 W151	94,-	075017 D007	168,-
Up to 800	073103 W152	94,-	075017 D008	168,-
Up to 900	073103 W153	94,-	075017 D009	168,-
Intermediate dimensions	073103 W085	16,-	075017 D011	22,-
	0103		0103	



### Gauge block kits according to DIN EN ISO 3650, accuracy level 0, 1 or 2

- Steel, carbide or ceramics
- Other set combinations or accuracies available on request

Contents	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
32-pcs.	<b>075013</b> W032	320,-	<b>075013</b> D032	324,-
47-pcs.	075013 W047	470,-	075013 D047	474,-
87-pcs.	075013 W087	870,-	075013 D087	874,-
103-pcs.	075013 W103	1.030,-	075013 D103	1.034,-
	0103		0103	



## Calibration of material measures

- DAkkS calibration:** Calibration and documentation in accordance with „Deutscher Akkreditierungstelle GmbH“
- Factory calibration:** Testing and documentation in compliance with VDI/VDE/DGQ 2618, in accordance with the manufacturer's instructions or in accordance with national or international guidelines
- Unless otherwise specified in the order, an accredited calibration is performed as standard.

**DAkkS calibration  
including  
DAkkS plate**

### Steel step gauges

- Calibration and documentation in accordance with the manufacturer's instructions

Measurement range mm	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
Up to 500	<b>079924</b> W901	460,-	DAkkS calibration on request	
Up to 1000	079924 W902	770,-		
Up to 1500	079924 W903	990,-		
	0103			



### Steel angle gauge blocks

- Factory calibration: Testing of the measuring surfaces and documentation of the angular deviation from the

End angle tolerance	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
All	<b>079922</b> W901	87,-	DAkkS calibration on request	
	0103			







### Ring gauges, go or no-go ring gauges

- Factory calibration: 5.3.4 Testing and documentation of the diameter on three levels staggered by 90° in compliance with VDI (Association of German Engineers) / VDE (Association for Electrical, Electronic & Information Technologies) / DGQ (German Society for Quality) 2618, Sheet 4.1
- DAkkS calibration: in compliance with Option 5.3.3, standard calibration for new gauges for use as working standard for transmission of measurements
- Setting ring gauges with constructional dimensions other than those specified in DIN 2250 are tested according to tolerance dimensions of the manufacturer.
- Nominal dimensions > 250 mm, available on request

Nominal dimension mm	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
1 to 2	<b>075635</b> W001	<b>34,-</b>	<b>075635</b> D001	<b>62,-</b>
Up to 3	075635 W002	19,-	075635 D002	42,-
Up to 50	075635 W003	16,-	075635 D003	36,-
Up to 100	075635 W004	20,-	075635 D004	44,-
Up to 200	075635 W005	24,-	075635 D005	62,-
Up to 250	075635 W006	78,-	075635 D006	82,-
	0103		0103	



### Test pins according to DIN 2269 up to a nominal dimension of 40 mm

- Factory calibration: Testing and documentation in compliance with Option 5.3.3
- Testing with extended documentation on request: also comprises documentation of out-of-roundness errors and the geometrical deviation of the cylinder surface line
- Test pins with nominal dimension > 40 mm: see go plug gauges, art.no. 075038...

Nominal dimension mm	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
0.1 to 1	<b>074011</b> W001	<b>8,-</b>	<b>074011</b> D001	<b>12,-</b>
1 to 10	074011 W002	5,-	074011 D002	9,-
10 to 20	074011 W003	7,-	074011 D003	11,-
20 to 40	074011 W004	20,-	074011 D004	24,-
	0103		0103	



### Replaceable thread measuring inserts for outside micrometers

- Factory calibration: Determination of angular deviation and straightness deviation of V-shaped anvil and taper
- Price for each V-block/taper pair

Design mm	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
0.25 to 6	<b>075662</b> W001	<b>36,-</b>	<b>075662</b> D001	<b>40,-</b>
	0103		0103	



### Graduated scales and steel rulers according to DIN 865

- Factory calibration: Calibration in accordance with manufacturer's instructions
- DAkkS calibration: carried out to OIML R35-1

Nominal dimension mm	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
Up to 500	<b>075003</b> W001	<b>29,40</b>	<b>075003</b> D001	<b>46,-</b>
Up to 1000	075003 W002	38,80	075003 D002	59,-
Up to 2000	075003 W003	64,40	075003 D003	96,-
Up to 3000	075003 W004	68,60	075003 D004	102,-
Up to 5000	075003 W901	136,-		
	0103		0103	



## Calibration of thread gauges

- **DAkkS calibration:** Calibration and documentation in accordance with „Deutscher Akkreditierungsstelle GmbH“
- **Factory calibration:** Testing and documentation in compliance with VDI/VDE/DGQ 2618, in accordance with the manufacturer's instructions or in accordance with national or international guidelines
- Unless otherwise specified in the order, an accredited calibration is performed as standard.
- The prices for the thread gauges listed in the following apply to single pitch threads. For threads with multiple pitches, the basic price for single pitch threads must be multiplied by the number of pitches.

**DAkkS calibration  
including  
DAkkS plate**

### Thread go and no-go plug gauges and adjusting mandrels

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 4.8
- Determination of the simple pitch diameter (repetitive calibration)
- Nominal dimensions > 350 mm available on request

Nominal dimension mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
Up to 3	<b>075039</b> W001	<b>32,-</b>	<b>075039</b> D001	<b>36,-</b>
Up to 50	075039 W002	13,-	075039 D002	17,-
Up to 100	075039 W003	17,-	075039 D003	21,-
Up to 200	075039 W004	38,-	075039 D004	42,-
Up to 350	075039 W006	85,-	075039 D006	89,-
	0103		0103	



### Thread plug gauges

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 4.8
- Determination of the simple pitch diameter (repetitive calibration)
- Nominal dimensions > 350 mm available on request

Nominal dimension mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
Up to 3	<b>075016</b> W001	<b>46,-</b>	<b>075016</b> D001	<b>50,-</b>
Up to 50	075016 W002	16,-	075016 D002	20,-
Up to 100	075016 W003	18,-	075016 D003	22,-
Up to 200	075016 W004	84,-	075016 D004	88,-
Up to 350	075016 W005	96,-	075016 D005	100,-
	0103		0103	



### Thread go and no-go ring gauges and ring gauges

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 4.9
- Determination of the simple pitch diameter (repetitive calibration)
- Nominal dimensions > 350 mm available on request

Nominal dimension mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
2.5 to 3	<b>075690</b> W001	<b>32,-</b>	<b>075690</b> D001	<b>36,-</b>
Up to 50	075690 W002	16,-	075690 D002	20,-
Up to 100	075690 W003	18,-	075690 D003	22,-
Up to 200	075690 W004	52,-	075690 D004	56,-
Up to 350	075690 W006	85,-	075690 D006	89,-
	0103		0103	



### Tapered thread limit plug gauges and thread ring gauges

- Calibration in compliance with national or international standards and documentation of the pitch diameter in the measuring plane and the pitch diameter - taper angle or the pitch diameter - taper deviation and thread ring gauges
- Nominal dimensions > 100 mm, available on request

Nominal dimension mm	Factory calibration art.no.	€	DAkkS calibration art.no.	€
3 to 50	<b>075682</b> W001	<b>54,-</b>	<b>075682</b> D001	<b>58,-</b>
Up to 100	075682 W002	68,-	075682 D002	72,-
	0103		0103	





## Calibration of plain gauges

- **DAkks calibration:** Calibration and documentation in accordance with „Deutscher Akkreditierungstelle GmbH“
- **Factory calibration:** Testing and documentation in compliance with VDI/VDE/DGQ 2618, in accordance with the manufacturer's instructions or in accordance with national or international guidelines
- Unless otherwise specified in the order, an accredited calibration is performed as standard.

**DAkks calibration  
including  
DAkks plate**

### Limit plug gauges or threshold flat plug gauges

- Factory calibration: Calibration and documentation in compliance with Option 5.3.4
- DAkks calibration: Testing and documentation in compliance with Option 5.3.3

Nominal dimension mm	Factory calibration limit plug gauge		DAkks calibration limit plug gauge		Factory calibration limit plug gauge, flat		DAkks calibration limit plug gauge, flat	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€
Up to 10	<b>075036</b> W001	10,-	<b>075036</b> D001	24,-	<b>075037</b> W010	19,-	<b>075037</b> D010	23,-
Up to 50	075036 W002	13,-	075036 D002	30,-	075037 W001	24,-	075037 D001	28,-
Up to 100	075036 W003	15,-	075036 D003	34,-	075037 W002	36,-	075037 D002	40,-
Up to 200	075036 W004	28,-	075036 D004	88,-	075037 W003	78,-	075037 D003	82,-
Up to 250	075036 W005	168,-	075036 D005	172,-				
Up to 300					075037 W004	112,-	075037 D004	116,-
	0103		0103		0103		0103	



### Go or no-go plug gauges, fully cylindrical version

- Factory calibration: Calibration and documentation in compliance with Option 5.3.4
- DAkks calibration: Testing and documentation in compliance with Option 5.3.3

Nominal dimension mm	Factory calibration art.no.	€	DAkks calibration art.no.	€
Up to 10	<b>075038</b> W001	9,-	<b>075038</b> D001	22,-
Up to 50	075038 W002	11,-	075038 D002	28,-
Up to 100	075038 W003	13,-	075038 D003	32,-
Up to 200	075038 W004	23,-	075038 D004	73,-
Up to 250	075038 W005	46,-	075038 D005	154,-
	0103		0103	



### Go or no-go gap gauges

- Calibration in compliance with VDI/VDE/DGQ 2618, Sheet 4.7 and documentation of the working or intrinsic dimension

Nominal dimension mm	Factory calibration art.no.	€	DAkks calibration art.no.	€
3 to 50	<b>075686</b> W001	14,-	<b>075686</b> D001	18,-
Up to 100	075686 W002	18,-	075686 D002	22,-
Up to 200	075686 W003	30,-	075686 D003	34,-
Up to 300	075686 W004	38,-	075686 D004	42,-
	0103		0103	



### Limit gap gauges

- Calibration in compliance with VDI/VDE/DGQ 2618, Sheet 4.7 and documentation of the working or intrinsic dimension

Nominal dimension mm	Factory calibration art.no.	€	DAkks calibration art.no.	€
3 to 50	<b>075693</b> W001	18,-	<b>075693</b> D001	22,-
Up to 100	075693 W002	21,-	075693 D002	25,-
Up to 200	075693 W003	41,-	075693 D003	45,-
Up to 300	075693 W004	48,-	075693 D004	52,-
	0103		0103	



Continued on next page >>>

**Taper plug gauges or taper ring gauges**

• Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 4.12

Nominal dimension mm	Factory calibration taper ring gauge		Factory calibration taper plug gauge	
	art.no.	€	art.no.	€
3 to 50	<b>079934</b> W901	36,-	<b>075682</b> W901	36,-
Up to 100	079934 W902	45,-	075682 W902	45,-
Up to 150			075682 W903	59,-
Up to 200	079934 W903	86,-		
Up to 300	079934 W904	178,-		
	0103		0103	



**Feeler gauge sets according to DIN 2275**

- Only in calibratable design
- Calibration and documentation in compliance with DIN 2275

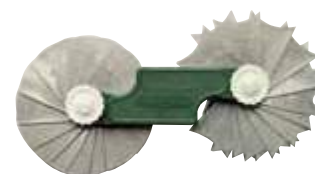
Design	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
1 blade	<b>075666</b> W001	18,-	<b>075666</b> D001	22,-
2-20 sheets (price per sheet)	075666 W002	2,80	075666 D002	6,80
20 sheets	075666 W003	56,-	075666 D003	60,-
	0103		0103	



**Sets of radius gauges for inside and outside radii**

- Only in calibratable design
- Calibration and documentation in accordance with the manufacturer's instructions

Design	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
1 blade	<b>075667</b> W001	24,-	<b>075667</b> D001	28,-
from 10 sheets (price per sheet)	075667 W002	3,60	075667 D002	7,60
	0103		0103	



Precision ...

... but digital.

**ATORN®**  
Performance demands quality

**Over 200,000 tools available online!**

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



**Register online now!**

**www.saratools.com**



## Calibration of appliances

- **DAkKS calibration:** Calibration and documentation in accordance with „Deutscher Akkreditierungstelle GmbH“
- **Factory calibration:** Testing and documentation in compliance with VDI/VDE/DGQ 2618, in accordance with the manufacturer's instructions or in accordance with national or international guidelines
- Unless otherwise specified in the order, an accredited calibration is performed as standard.

### Flat rulers

- Calibration and documentation in compliance with VDI/VDE/DGQ 2618, Sheet 5.1

Nominal dimension mm	Factory calibration art.no. €	DAkKS calibration art.no. €
Up to 200	<b>075035</b> W001 19,60	<b>075035</b> D001 32,-
Up to 500	075035 W002 28,-	075035 D002 44,-
Up to 1000	075035 W003 40,60	075035 D003 62,-
Up to 2000	075035 W902 52,50	
Up to 3000	075035 W903 138,-	
	0103	0103

**DAkKS calibration  
including  
DAkKS plate**



### Spring tape measures

- Factory calibration: Calibration in accordance with manufacturer's instructions
- DAkKS calibration: Calibration carried out to OIML R35-1

Nominal dimension m	Factory calibration art.no. €	DAkKS calibration art.no. €
Up to 3	<b>075004</b> W003 29,40	<b>075004</b> D003 46,-
Up to 5	075004 W005 38,50	075004 D005 59,-
Up to 8	075004 W008 50,40	075004 D008 76,-
Up to 10	075004 W010 56,70	075004 D010 85,-
Up to 20	075004 W020 94,50	075004 D020 139,-
Up to 30	075004 W030 129,50	075004 D030 189,-
Up to 50	075004 W050 330,-	075004 D050 334,-
Up to 100	075004 W100 495,-	075004 D100 499,-
	0103	0103



### Straight edges according to DIN 874, Sheet 5.2

- Calibration, documentation in compliance with VDI/VDE/DGQ 2618 Sheet 5.2

Nominal dimension mm	Factory calibration art.no. €	DAkKS calibration art.no. €
Up to 100	<b>075034</b> W001 16,80	<b>075034</b> D001 28,-
Up to 200	075034 W002 21,-	075034 D002 34,-
Up to 600	075034 W003 30,80	075034 D003 48,-
Up to 1000	075034 W901 35,-	
Up to 1500	075034 W902 89,-	
	0103	0103



### Bevel, flat and try square

- Calibration and documentation of the maximum deviation of planarity, perpendicularity and parallelism in compliance with VDI/VDE/DGQ 2618, Sheet 7.1
- Nominal dimension: Length of the largest leg
- Other dimensions on request

Nominal dimension mm	Factory calibration art.no. €	DAkKS calibration art.no. €
Up to 100	<b>075664</b> W001 14,-	<b>075664</b> D001 32,-
Up to 600	075664 W002 20,-	075664 D002 40,-
	0103	0103



### Centring angle

- Only in calibratable design
- Calibration and documentation in accordance with the manufacturer's instructions

Nominal dimension mm	Factory calibration art.no. €	DAkKS calibration art.no. €
Up to 100	<b>075665</b> W001 46,-	<b>075665</b> D001 50,-
Up to 600	075665 W002 54,-	075665 D002 58,-
	0103	0103



### Coplanar glass targets

- Calibration of planarity, parallelism and thickness as well as documentation in accordance with the manufacturer's instructions

Ø mm	Factory calibration art.no. €	DAkKS calibration art.no. €
Up to 50	<b>075669</b> W001 124,-	<b>075669</b> D001 128,-
Up to 100	075669 W002 154,-	075669 D002 158,-
	0103	0103



Continued on next page >>>



**Optical flats**

- Calibration of planarity and documentation in accordance with the manufacturer's instructions

Ø mm	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
Up to 50	<b>075668</b> W020	86,-	<b>075668</b> D010	90,-
Up to 100	075668 W002	124,-	075668 D002	128,-
	0103		0103	

**Dial indicator testing equipment**

- Calibration and documentation in accordance with the manufacturer's instructions

Design	Factory calibration	
	art.no.	€
All	<b>073103</b> W083	230,-
	0103	

**Sine bars according to DIN 2273**

- Calibration and documentation in compliance with DIN 2273 or according to the manufacturer's instructions

Nominal dimension mm	Factory calibration	
	art.no.	€
All	<b>079928</b> W901	76,-
	0103	

**Steel, hard stone or ceramic testing columns**

- DAkkS-DIN EN ISO 1101:2008

Nominal dimension mm	Factory calibration		DAkkS calibration	
	art.no.	€	art.no.	€
Up to 400	<b>075660</b> W001	480,-	<b>075660</b> D001	484,-
	0103		0103	

**Torque wrench according to DIN EN ISO 6789-2:2017**

- Factory calibration: Calibration and documentation in accordance with company standard DIN ISO 6789-1:2017
- Other versions available on request

Design N-m	Torque N-m	Factory calibration		DAkkS calibration	
		art.no.	€	art.no.	€
Right-hand display	> 1 - 1100	<b>075048</b> W001	55,-	<b>075048</b> D001	144,-
Right-hand and left-hand display	> 1 - 1100	075048 W002	110,-	075048 D002	199,-
Right-hand release	> 1 - 1100	075048 W011	38,-	075048 D011	100,-
Right-hand and left-hand release	> 1 - 1100	075048 W012	76,-	075048 D012	144,-
		0103		0103	

**Engraving, inspection plate and sealing**

- Engraving the identification number on measuring equipment
- Attaching the inspection plates

For attaching the inspection plate, please specify the month and year of the next calibration in the order; otherwise a recalibration period of 12 months is assumed.

- Sealing

The gauges can be sealed with wax dipping compound on request.

Designation	art.no.	€
Engraving	<b>079001</b> 0001	5,50
Inspection plate	079001 0013	1,-
Sealing gauges up to 50 mm	079001 0015	1,50
Sealing gauges up to 200 mm	079001 0016	2,50
	0103	





**TOOL**  
**WORN-OUT.**  
**THAT WON'T**  
**STOP YOU**

**BECAUSE YOU ARE ALWAYS PREPARED:  
SARA® GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

**TOOL REPAIR SERVICE**

- **Time advantage:** time required for replacement is shorter than the time to produce a new tool
- State-of-the-art reconditioning of damaged machining tools with indexable insert seats
- We guarantee the tolerances, geometrical shapes and wear resistance specified by the original tool manufacturer for standard tools, and also for drawing-based special tools
- Measurement logs on request (measurement logs are only useful from a technical perspective if all insert seats have been repaired or revised, as otherwise the tolerances of the tool cannot be fully guaranteed).
- Reduces tooling costs in manufacturing division: the costs of refurbishment are only approx. 50% of new prices.
- Short delivery times
- Please send the tools, carriage paid, to our address.
- Tools are sent back on payment of the costs incurred.
- Upon request, you will receive a cost estimate immediately after the test.

**Der Vorher-Nachher-Effekt****MEASURING EQUIPMENT REPAIR**

- Repair of your measuring equipment
- Virtually all well-known brands
- Save up to 50% compared to the original price
- New measuring equipment at a special price in cases where repair would be uneconomical
- On request: Calibration through our partner laboratory

**Further information:**

Service management  
[service@sartorius-werkzeuge.de](mailto:service@sartorius-werkzeuge.de)

Please be advised that if a cost estimate is rejected, a processing fee of €30 net will be charged.





**RIGHT ACROSS** **EUROPE.**  
**WE MANAGE THAT FOR YOU**  
**WITHIN**  
**24 HOURS:**  
**24-HOUR DELIVERY**  
**THROUGHOUT EUROPE**

**THAT'S POWER TO PRODUCE**






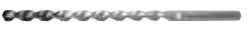



**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE










# Drilling tools

HSS twist drills		
<b>INFO</b>	Overview of drilling tools HSS cutting materials	51
	Centring and spotting drills	53
	Step centring drills <b>NEW</b>	55
	Twist drills DIN 1897	57
	Micro-drilling tools from 0.05 mm	66
	Twist drills DIN 338	67
	Deep-hole drill	90
	Twist drill with MT shank	99
	Step drill bit	105
	Core drills	107

Solid carbide twist drill		
<b>INFO</b>	Overview of solid carbide twist drill	109
	Centring and spotting drills	111
	High-performance NC drills <b>NEW</b>	112
	HYP-LDS NC spotting drill <b>NEW</b>	114
	Solid carbide twist drills 3xD	115
	Solid carbide micro drills ADO-MICRO up to 30xD <b>NEW</b>	116
	HYP-HPO 3xD solid carbide high-performance drill <b>NEW</b>	127
	Solid carbide high-performance drills HARD 3xD <b>NEW</b>	131

	Solid carbide twist drill 5xD	135
	Solid carbide high-performance drill HYP-HPO 5xD <b>NEW</b>	141
	Solid carbide high-performance drills HARD 5xD <b>NEW</b>	149
	Solid carbide high-performance drill 8xD to 30xD	151
	ADO solid carbide deep-hole drill up to 50xD <b>NEW</b>	163
	Solid carbide flat drill	164
	Solid carbide flat drills FLAT 3xD and 5xD <b>NEW</b>	166
	Solid carbide high-performance drill HIGH FEED 5xD <b>NEW</b>	169
	Solid carbide drill reamers	171
	Solid carbide drilling tools for fibrous materials	172
	Solid carbide step drill	173

Modular drilling tools		
<b>INFO</b>	Overview of modular drilling tools	174
	NC spotting drill bit <b>NEW</b>	175
	Replaceable head drill ETD 840	176
	Replaceable head drill PXD <b>NEW</b>	181
	T-A Pro drilling system up to 15xD <b>NEW</b>	184
	T-A drilling system with cutting inserts	189
	Indexable inserts solid drill	200
	Core and countersink drill <b>NEW</b>	209








	Indexable insert drilling system VORTEX DRILL	212
	Solid drilling tool SARADRILL	216
	Universal drilling and turning tool	<b>NEW</b> 219
	Precision boring bar, adjustable	221
	Reverse countersink 45°	223



### Hand taps

<b>INFO</b>	Overview of hand taps	225
	Hand taps	226



### Machine tap

<b>INFO</b>	Overview Machine tap	231
	Machine threading taps, blind-hole and through-hole threads	234
	Machine tap Synchro	253
	Machine tap A-SFT type E	<b>NEW</b> 261

### Machine forming taps


<b>INFO</b>	Overview of machine forming taps	289
	Machine forming taps	290
	Machine forming tap S-OIL-XPFL with internal cooling	<b>NEW</b> 294


### Taps and accessories


	Solid carbide tap extractors	297
	Thermal drill	298


	Thread repair kits Helicoil plus	300
--	-------------------------------------	-----


<b>INFO</b>	Overview of threading dies	301
-------------	----------------------------	-----

	Threading dies	302
---	----------------	-----

	Vapour-treated threading die	<b>NEW</b> 304
---	------------------------------	----------------


	Thread cutting tool sets	308
---	--------------------------	-----


	Accessories for taps and threading dies	310
--	--	-----

	Tap wrench and threading die holder, reinforced version	<b>NEW</b> 312
---	--	----------------

### Countersink and deburring tools


<b>INFO</b>	Overview of countersinks	314
-------------	--------------------------	-----


	Taper and deburring countersinks	315
--	-------------------------------------	-----

	Flat countersink	325
--	------------------	-----

### Reamers


<b>INFO</b>	Overview of reamers	329
-------------	---------------------	-----

	Machine reamers	334
--	-----------------	-----

	Solid carbide high-performance reamers	342
--	---	-----

	Exchangeable reamers	343
--	----------------------	-----

### Spindle tools

	MHD spindle tool system	346
--	----------------------------	-----

	Honing tools	357
--	--------------	-----












Technical information, usage recommendations		359
--	--	-----

## Summary of icons used for drilling tools

INFO

<b>Cutting material</b>	 <b>HSS</b> High-performance, high-speed steel	 <b>HSS-E</b> High-performance, high-speed steel Cobalt-alloyed	 <b>VHM</b> Solid carbide
<b>Coating</b>	 <b>TiN</b> Titanium-nitride coating	 <b>TiCN</b> Titanium-carbo-nitride coating	 <b>TiAlN</b> Titanium-aluminium-nitride coating
<b>Surface treatment</b>	 <b>Nit.</b> Nitrided surface	 <b>Vap.</b> Vapour-treated surface (steam-treated)	
<b>Type/profile</b>	 <b>Typ N</b> e.g. type N, for normal materials	 <b>Typ TLP</b> e.g. type TLP Deep hole profile	 <b>Typ VA</b> e.g. type VA for machining stainless steel
<b>Standard</b>	 <b>DIN 338</b> Complies with DIN 338	 <b>ISO 10898</b> Complies with ISO standard 10898	 <b>Werks-norm</b> Manufactured in accordance with factory standard
<b>Shank design</b>	 <b>DIN 6535 HA</b> Straight shank in accordance with DIN 6535 HA	 Straight shank with Weldon clamping surface	 MT shank
<b>Drilling depth</b>	 <b>3xD</b> possible drilling depth at least 3 x diameter		
<b>Point angle</b>	 <b>118°</b> Point angle of the drill is 118°		
<b>Ground point</b>	 Cone-shaped shell	 Pointed crosscut	 Facet-ground
<b>Spiral angle</b>	 <b>15°</b> Spiral angle is 15° right-hand twist	 <b>40°</b> Tap 40° right-hand twist	
<b>Form (centring drill)</b>	 <b>A</b> Form A For centring holes without protected centre	 <b>B</b> Form B For centring holes with tapered protected centre	 <b>R</b> Form R For centring holes with radius
<b>Countersink angle</b>	 <b>60°</b> Countersink angle is 60°		
<b>Thread</b>	 <b>M</b> metric thread	 <b>MF</b> metric fine thread	 <b>BSW</b> British Standard Whitworth
<b>Thread depth</b>	 <b>2,5xD</b> possible thread depth 2.5 x nominal diameter		
<b>Thread angle</b>	 <b>60°</b> Thread angle is 60°		
<b>Chamfer</b>	 <b>B 3,5-5</b> Tap with 3.5-5-way chamfer	 Tap with spiral point	 Tap straight-fluted; Forming tap with oil grooves
<b>Threaded hole type</b>	 For blind-hole threads	 For through-hole threads	 For blind-hole and through-hole threads
<b>Coolant bore version</b>	 Axial coolant outlet	 Radial coolant outlet	
<b>Cutting data</b>	 <b>i Vc/fz</b> Further information such as cutting data recommendations is available in the technical appendix		












## Overview of HSS / HSS-E / HSS-E-PM twist drills

	DIN 333				Factory standard		DIN 332/2		DIN 333		ISO 10898	
Sorting by drilling depth and shank design												
	Brand	ATORN®	SARA	ATORN®	SARA	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
	Drilling depth											
	ISO	P M K S N	P M K S N	P M K S N	P M K S N	P M K S N	P M K S N	P M K S N	P M K S N	P M K S N	P M K S N	P M K S N
	Diameter range [mm]	0,5 - 10	0,8 - 10	1 - 5	1 - 5	0,75 - 5	2 - 4	M3 - M12	M4 - M24	1 - 6,3	1 - 6,3	3 - 20
	Type	A	A	A	A	A, long	A, Extra-long	A	A-FL	R	B	
	Point angle	60°	60°	60°	60°	60°	60°	60°	60°	60°	60°/120°	90°
	Cutting material	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS-E
	Coating, surface treatment			TiAlN								
	Item number	100101....	100141....	100109....	100149....	100103....	100104....	102214....	102215....	100107....	100105....	100130....
	Catalogue page	53	53	53	53	54	54	55	55	55	56	56

	ISO 10898			Factory standard		DIN 1897					Factory standard	
Sorting by drilling depth and shank design												
	Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
	Drilling depth						3 x D	3 x D	3 x D	3 x D	3 x D	3 x D
	ISO	P M K S N	P M K S N	P M K S N	P M K S N	P M K S N	P K S N	P M K N	P M K N	P M K N	P M K N H	P M S N
	Diameter range [mm]	3 - 20	3 - 20	3 - 20	4 - 20	4 - 20	1 - 25	1 - 12	1 - 20	1 - 13	1 - 14	1 - 20
	Type				Extra-long	Extra-long	NV	NV	NE	NV	TLP	EX-SUS
	Point angle	90°	120°	120°	90°	90°	118°	130°	130°	130°	130°	120° - 140°
	Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E-V3
	Coating, surface treatment	TiN		TiN			vap.	vap.		TiN	TiN	TiN
	Item number	100131....	100120....	100121....	100132....	100122....	101050....	101055....	101052....	101051....	101085....	114045....
	Catalogue page	56	56	56	57	57	57	59	59	61	62	64

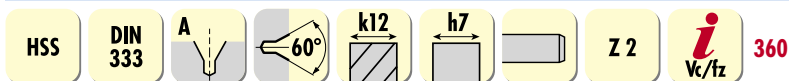
	Factory standard	DIN 1899	DIN 338									
Sorting by drilling depth and shank design												
	Brand	ATORN®	ATORN®	SARA	ATORN®	SARA	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
	Drilling depth	3 x D	5 x D	5 x D	5 x D	5 x D	5 x D	5 x D	5 x D	5 x D	5 x D	5 x D
	ISO	P K N	P K N	P M K N	P K N	P K N	P M S N	P K N	N	P M K N	P M S N	P M K N
	Diameter range [mm]	13.5 - 25.0	0.05 - 1.50	0.4 - 16	0.4 - 20.0	0.5 - 16	1 - 16	1 - 12	1 - 14	1 - 20	1 - 16	1 - 12
	Type	N	N	N	N	N	N	TLP	W	N	Ti	TLP
	Point angle	118°	118°	118°	118°	118°	118°	130°	130°	118°	130°	130°
	Cutting material	HSS	HSS-E-PM	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E
	Coating, surface treatment	vap.			vap.	vap.	TiN			vap.		
	Item number	101080....	101075....	101002....	101005....	101405....	101008....	101011....	101017....	101006....	101010....	101013....
	Catalogue page	66	69	66	67	69	69	73	74	75	75	79

	DIN 338							Factory standard	DIN 340			
Sorting by drilling depth and shank design												
	Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	✚	ATORN®	ATORN®	ATORN®	
	Drilling depth	5 x D	5 x D	5 x D	5 x D	5 x D	5 x D	5 x D	10 x D	10 x D	10 x D	
	ISO	P M K	P M K N	P M K S N	P M K N H	P M K S N	P M K S N	P M K N H	P M S N	P K N	P K N	
	Diameter range [mm]	1 - 16	1 - 12	1 - 13	1 - 13	1 - 13	2 - 13	1 - 14	2 - 20	0.6 - 16.0	1 - 12	1 - 16
	Type	TLP	TLP	N	NV	VA	VA	TLP	EX-SUS	N	TLP	TLP
	Point angle	130°	130°	130°	135°	130°	135°	130°	120° - 140°	118°	130°	130°
	Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E-V3	HSS	HSS	HSS-E
	Coating, surface treatment	TiN	TiAlN		vap.			TiN	TiN	vap.	TiN	Nit.
	Item number	101014....	101012....	101040....	101016....	101018....	101076....	101095....	114050....	101060....	101061....	101063....
Catalogue page	79	79	81	82	84	85	86	88	90	91	92	

	DIN 340	DIN 1869	Factory standard			DIN 345			DIN 341	Factory standard	DIN 343	
Sorting by drilling depth and shank design												
	Brand	ATORN®	ATORN®	✚	✚	✚	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	
	Drilling depth	10 x D	> 10 x D	10 x D	15 x D	20 x D	5 x D	5 x D	5 x D	10 x D	> 10 x D	
	ISO	P M S N	P K N	P K	P K	P K	P M K N	P M K N	P M S N	P K N	P M K S N	P K N
	Diameter range [mm]	1 - 12	2 - 10	1,6 - 12	1,6 - 12	1,6 - 12	5 - 50	12 - 35	12.5 - 23.0	10 - 50	8 - 25	7.8 - 40.0
	Type	VA	TLP	TDXL	TDXL	TDXL	N	N	VA	N	TLP	N
	Point angle	130°	130°	120°	120°	120°	118°	118°	130°	118°	130°	
	Cutting material	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS	HSS-E	HSS-E	HSS	HSS	HSS
	Coating, surface treatment			WXL	WXL	WXL	vap.	vap.		vap.		
	Item number	101062....	101070....	101099....	101100....	101101....	101505....	101507....	101605....	101601....	101700....	101515....
Catalogue page	94	95	96	97	98	99	100	101	102	103	104	

	DIN 8374			Factory standard							DIN 8037
Sorting by drilling depth and shank design											
	Brand	ATORN®	ATORN®	ATORN®	SARA®	SARA®	SARA®	SARA®	EUROBOOR	EUROBOOR	SARA®
	Drilling depth								30 mm	55 mm	3 x D
	ISO	P K	P K	P K	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P K S N H
	Diameter range [mm]	M3 - M10	M3 - M10	M3 - M10	4 - 30	4 - 30	3 - 61	3 - 61	12 - 60	12 - 60	2 - 16
	Type		fine		STEP	STEP	TS	TS	KB	KB	
	Point angle	90°	90°	180°							118°
	Cutting material	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HM K10
	Coating, surface treatment	vap.	vap.	vap.		TiN	vap.	TiN			
	Item number	102101....	102102....	102103....	102650....	102652....	102660....	102665....	100601....	100602....	110501....
Catalogue page	105	105	105	106	106	106	106	107	107	108	

## ATORN® SARA® Centring drills

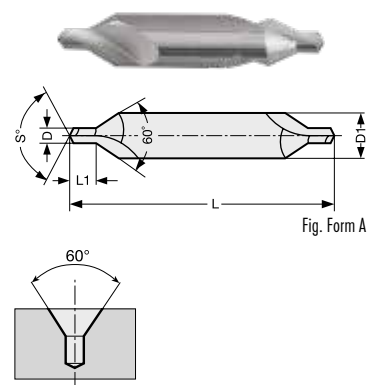


- For centring holes without protected centre DIN 332 A
- Spiral-fluted
- Bare surface
- Ø 0.5 mm and 0.8 mm, single cutting edge
- 100101.... precision-ground design
- 100141.... ground from solid material

material	● very well suited	steel		stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		35	20	12	8	8		20	12	8			40					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

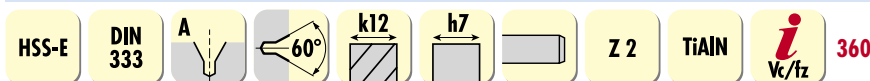
D mm	D1 mm	L1 min./max.	L mm	Feed f steel < 1000 N/mm² mm/rev	ATORN®		SARA®	
					art.no.	€	art.no.	€
0.50	3.15	0.6-0.8 mm	25	0.05	5	100101 0050	3,72	
0.80	3.15	1-1.3 mm	25	0.05	5	100101 0080	3,72	5 100141 0080 2,86
1.00	3.15	1.3-1.7 mm	31	0.05	5	100101 0100	3,69	5 100141 0100 2,86
1.25	3.15	1.6-2.0 mm	31	0.05	5	100101 0125	3,64	5 100141 0125 2,86
1.60	4	2.0-2.6 mm	35	0.05	5	100101 0160	3,72	5 100141 0160 2,86
2.00	5	2.5-3.1 mm	40	0.05	5	100101 0200	4,39	5 100141 0200 3,51
2.50	6.3	3.1-3.8 mm	45	0.05	5	100101 0250	5,50	5 100141 0250 4,01
3.15	8	3.9-4.6 mm	50	0.07	5	100101 0315	6,15	5 100141 0315 4,97
4.00	10	5.0-5.9 mm	55	0.07	1	100101 0400	7,10	1 100141 0400 6,30
5.00	12.5	6.3-7.2 mm	63	0.07	1	100101 0500	11,40	1 100141 0500 9,90
6.30	16	8.0-8.9 mm	71	0.14	1	100101 0630	20,30	1 100141 0630 16,80
8.00	20	10.1-11.1 mm	80	0.14	1	100101 0800	38,50	1 100141 0800 29,40
10.00	25	12.8-13.8 mm	100	0.21	1	100101 1000	64,70	1 100141 1000 51,80



Set	Number of pieces	Contents	ATORN®		SARA®	
			art.no.	€	art.no.	€
15-pcs.	3 units 1.6 x 4 mm   3 units 2 x 5 mm   3 units 2.5 x 6.3 mm   3 units 3.15 x 8 mm	2 units 4 x 10 mm   1 unit 5 x 12.5 mm	100109 1015	82,90	100111 0001	67,10



## ATORN® SARA® Centring drills

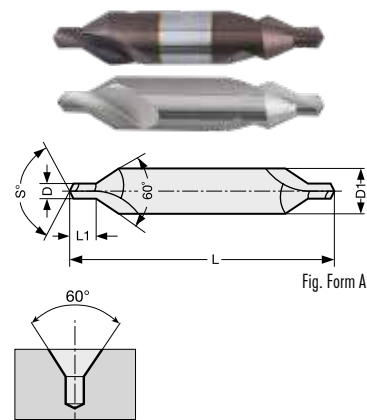


- For centring holes without protected centre DIN 332 A
- Spiral-fluted, high true-running accuracy
- 100109.... TiAlN-coated
- 100149.... Bare surface

material	● very well suited	steel		stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
100109....		40	20	20	15	10		20	20	5	5	5	80	50	40	10			
100149....		35	20	12	8	8		20	12	8			75	40	45				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D1 mm	L1 min./max.	L mm	Feed f steel < 1000 N/mm² mm/rev	ATORN®		SARA®		
					TiAlN art.no.	€	Blank art.no.	€	
1.00	3.15	1.3-1.6 mm	31.5	0.01	5	100109 0100	11,85	5 100149 0100	5,15
1.25	3.15	1.6-1.9 mm	31.5	0.02	5	100109 0125	11,85	5 100149 0125	5,50
1.60	4	2-2.4 mm	30.3	0.02	5	100109 0160	11,85	5 100149 0160	5,35
2.00	5	2.5-2.9 mm	40	0.02	5	100109 0200	12,50	5 100149 0200	6,30
2.50	6.3	3.1-3.6 mm	45	0.03	5	100109 0250	14,60	5 100149 0250	7,35
3.15	8	3.9-4.4 mm	50	0.03	5	100109 0315	17,70	5 100149 0315	7,75
4.00	10	5-5.6 mm	56	0.04	1	100109 0400	21,70	1 100149 0400	12,95
5.00	12.5	6.3-6.9 mm	63	0.04	1	100109 0500	39,60	1 100149 0500	20,70





## ATORN® Centring drills, long

HSS-E
DIN 333
A
60°
k12
h7
Z 2
i Vc/fz
360

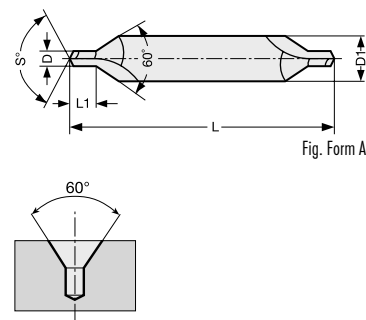
- Long version for centring with access problems
- For centring holes without protected centre DIN 332 A
- Spiral-fluted, high true-running accuracy
- Bare surface
- Similar to DIN 333A

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		40	20	10	10	8		20	20	8			80	50	40	10			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 mm	L1 min./max.	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
0.75	3.5	1-1.2 mm	120	0.05	100103 0075	39,90
1.00	4	1.3-1.6 mm	120	0.05	100103 0100	15,50
1.60	5	2-2.4 mm	120	0.05	100103 0160	14,25
2.00	6	2.5-2.9 mm	120	0.05	100103 0200	14,30
2.50	8	3.1-3.6 mm	120	0.05	100103 0250	16,60
3.15	10	3.9-4.4 mm	120	0.07	100103 0315	19,75
4.00	10	5-5.6 mm	120	0.07	100103 0400	25,-
5.00	14	6.3-6.9 mm	120	0.07	100103 0500	52,90



1101

## ATORN® Centring drills, extra-long

HSS-E
DIN 333
A
60°
k12
h7
Z 2
i Vc/fz
360

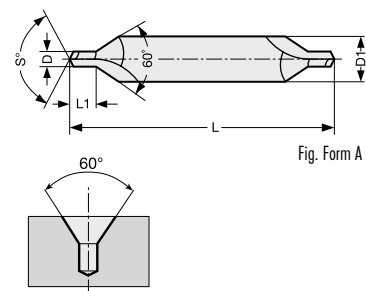
- Extra-long version for centring with access problems
- For centring holes without protected centre DIN 332 A
- Spiral-fluted, high true-running accuracy
- Bare surface
- Similar to DIN 333A

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		40	20	10	10	8		20	20	8			80	50	40	10			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 mm	L1 min./max.	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
2.00	5	2.5-3.1 mm	200	0.05	100104 0200	62,10
2.50	6.3	3.1-3.6 mm	200	0.05	100104 0250	63,10
3.15	8	3.9-4.4 mm	200	0.07	100104 0315	60,10
4.00	10	5-5.6 mm	200	0.07	100104 0400	64,10



1101

## ATORN® Step centring drill

HSS-E DIN 332/2 A 60° Vc/fz 360

- for threaded core hole centring characteristics in compliance with Form A, 60°
- simultaneous, perfectly-aligned placement of core holes, threaded entry bevel 90° and centring 60°
- blank, profile-ground surface
- 102215: with additional shank surface

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		35	20	12	8	8		20	12	8			75	45	45					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

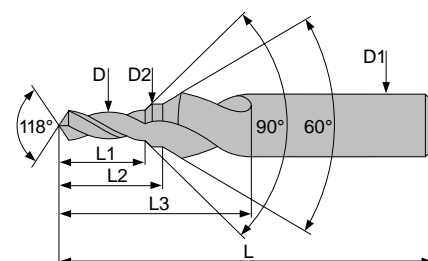
for thread	D mm	D2 mm	D1 mm	L3 mm	L2 mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€	with surfaces art.no.	€
M3	2.5	3.2	6	18	9	8	55	0.03	102214 0030	52,30		
M4	3.3	4.3	8	23	12.6	11	63	0.05	102214 0040	45,90	102215 0040	55,-
M5	4.2	5.3	10	27	15.1	13	67	0.07	102214 0050	52,30	102215 0050	57,-
M6	5	6.4	12.5	33	18.9	16	71	0.10	102214 0060	60,10	102215 0060	65,10
M8	6.8	8.4	14	41	23	19	88	0.12	102214 0080	73,10	102215 0080	89,50
M10	8.5	10.5	16	47	27.7	23	90	0.15	102214 0100	84,70	102215 0100	96,70
M12	10.2	13	20	59	34.5	28	105	0.15	102214 0120	114,-	102215 0120	137,50
M16	14	17	25	67	41.3	33	132	0.16			102215 0160	219,-
M20	17.5	21	31.5	77	48.3	38	145	0.18			102215 0200	346,-
M24	21	25	40	90	57	45	160	0.20			102215 0240	579,-



102214



102215



## ATORN® Centring drills with radius

HSS DIN 333 R 60° k12 h7 Z 2 Vc/fz 360

- For centring holes with radius DIN 332 R
- combines an annular application of the workpiece at the centre point with the advantages of a bell-type countersink, improved fit of the workpiece
- Greater stability due to radial transition
- Reduces risk of breaking
- Spiral-fluted, bare surface

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		40	20	10	10	8		20	20	8			80	50	40	10			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D1 mm	L1 min./max.	L mm	R mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
1.00	3.15	3-3.3 mm	31.5	2.9	0.05	5 100107 0100	3,97
1.25	3.15	3.3-3.6 mm	31.5	3.15	0.05	5 100107 0125	3,97
1.60	4	4.2-4.7 mm	30.3	4	0.05	5 100107 0160	3,97
2.00	5	5-5.4 mm	40	5	0.05	5 100107 0200	4,22
2.50	6.3	6.3-6.8 mm	45	6.3	0.05	5 100107 0250	4,72
3.15	8	8-8.5 mm	50	8	0.07	5 100107 0315	5,90
4.00	10	10-10.6 mm	56	10	0.07	1 100107 0400	7,60
5.00	12.5	12.5-13.1 mm	63	12.5	0.07	1 100107 0500	11,85
6.30	16	16-16.6 mm	71	16	0.14	1 100107 0630	21,70

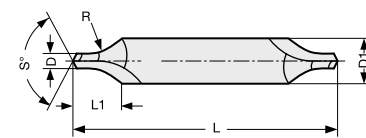
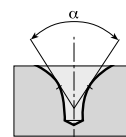


Fig. Form R



1101

## ATORN® Centring drills with protected centre

HSS
DIN 333
B
60°
k12
h7
Z 2
Vc/tz
360

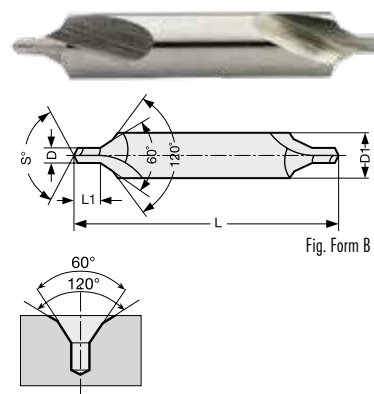
- For centring holes with protected centre DIN 332 B
- 60° centre holes, 120° tapered countersunk recess
- Application of the workpiece to the centre point over a large surface area with the advantages of a bell-type countersink
- Suitable for workpieces which are subject to deformation tension during machining
- Spiral-fluted, bare surface

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		40	20	10	10	8		20	20	8			80	50	40	10				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D1 mm	L1 min./max.	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
1.00	4	1.3-1.7 mm	35	0.05	5 100105 0100	5,40
1.25	5	1.6-2.0 mm	40	0.05	5 100105 0125	6,15
1.60	6.3	2.2-4 mm	45	0.05	5 100105 0160	6,95
2.00	8	2.5-2.9 mm	50	0.05	5 100105 0200	7,65
2.50	10	3.1-3.6 mm	56	0.05	5 100105 0250	10,-
3.15	11.2	3.9-4.4 mm	60	0.07	5 100105 0315	12,60
4.00	14	5-5.6 mm	67	0.07	1 100105 0400	18,75
5.00	18	6.3-7.2 mm	77	0.07	1 100105 0500	29,-
6.30	20	8.0-8.9 mm	80	0.14	1 100105 0630	39,40

1101



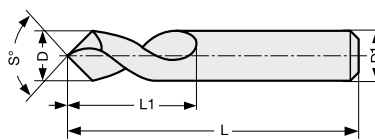
## ATORN® NC spotting drill

HSS-E
90°
120°
h7
h6
Z 2
TiN
Vc/tz
361

- S° = point angle 90° or 120°
- Precision-ground point
- Version 90° from Ø 4 mm pointed
- High stability due to short chip flutes
- For fast drilling on NC/CNC machines and machining centres with precise positioning

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
100130....		40	20	10	12	10		45	20	6	6		80	70	40	10				
100131....		50	30	12	20	15		45	30	10	10	10	90	80	50	10				
100120....		40	20	10	12	10		45	20	6	6		80	70	80	10				
100121....		50	30	12	20	15		45	30	10	10	10	90	80	50	10				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	90° art.no.	€	90°, TiN art.no.	€	120° art.no.	€	120°, TiN art.no.	€
3.00	3	10	50	0.04	100130 0300	7,25	100131 0300	11,30	100120 0300	7,25	100121 0300	11,30
4.00	4	12	52	0.05	100130 0400	7,25	100131 0400	11,30	100120 0400	7,25	100121 0400	11,30
5.00	5	15	60	0.05	100130 0500	7,80	100131 0500	12,60	100120 0500	7,80	100121 0500	12,60
6.00	6	20	66	0.06	100130 0600	10,05	100131 0600	14,55	100120 0600	10,05	100121 0600	14,55
8.00	8	25	79	0.07	100130 0800	11,15	100131 0800	19,25	100120 0800	11,15	100121 0800	19,25
10.00	10	25	89	0.08	100130 1000	14,40	100131 1000	23,60	100120 1000	14,40	100121 1000	23,60
12.00	12	30	102	0.08	100130 1200	18,35	100131 1200	32,40	100120 1200	18,35	100121 1200	32,40
16.00	16	35	115	0.09	100130 1600	33,-	100131 1600	52,40	100120 1600	33,-	100121 1600	52,40
20.00	20	40	131	0.09	100130 2000	45,70	100131 2000	87,40	100120 2000	45,70	100121 2000	87,40

1101

1101

1101

1101



D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
3.40	20	52	0.07	10	101050 0340	1,85
3.50	20	52	0.07	10	101050 0350	1,72
3.60	20	52	0.08	10	101050 0360	1,90
3.70	20	52	0.08	10	101050 0370	2,58
3.80	22	55	0.08	10	101050 0380	2,12
3.90	22	55	0.09	10	101050 0390	2,18
4.00	22	55	0.09	10	101050 0400	2,05
4.10	22	55	0.09	10	101050 0410	2,12
4.20	22	55	0.09	10	101050 0420	2,12
4.30	24	58	0.1	10	101050 0430	2,45
4.40	24	58	0.1	10	101050 0440	3,29
4.50	24	58	0.1	10	101050 0450	2,23
4.60	24	58	0.11	10	101050 0460	2,67
4.65	24	58	0.11	10	101050 1465	5,05
4.70	24	58	0.11	10	101050 0470	2,62
4.80	26	58	0.11	10	101050 0480	2,58
4.90	26	62	0.11	10	101050 0490	2,58
5.00	26	62	0.12	10	101050 0500	2,52
5.10	26	62	0.12	10	101050 0510	2,58
5.20	26	62	0.12	10	101050 0520	2,78
5.30	26	62	0.12	10	101050 0530	3,02
5.40	28	66	0.13	10	101050 0540	2,89
5.50	28	66	0.13	10	101050 0550	2,89
5.60	28	66	0.13	10	101050 0560	4,12
5.70	28	66	0.14	10	101050 0570	2,18
5.80	28	66	0.14	10	101050 0580	3,45
5.90	28	66	0.14	10	101050 0590	4,12
6.00	28	66	0.14	1	101050 0600	3,02
6.10	31	70	0.15	1	101050 0610	4,35
6.20	31	70	0.15	1	101050 0620	3,39
6.30	31	70	0.15	1	101050 0630	4,97
6.40	31	70	0.16	1	101050 0640	3,68
6.50	31	70	0.16	1	101050 0650	3,39
6.60	31	70	0.16	1	101050 0660	3,79
6.70	31	70	0.16	1	101050 0670	5,65
6.80	34	74	0.17	1	101050 0680	4,07
6.90	34	74	0.17	1	101050 0690	5,05
7.00	34	74	0.17	1	101050 0700	4,07
7.10	34	74	0.18	1	101050 0710	5,15
7.20	34	74	0.18	1	101050 0720	5,65
7.30	34	74	0.18	1	101050 0730	6,35
7.40	34	74	0.18	1	101050 0740	5,20
7.50	34	74	0.19	1	101050 0750	4,56
7.70	37	79	0.19	1	101050 0770	7,90
7.80	37	79	0.19	1	101050 0780	5,90
7.90	37	79	0.2	1	101050 0790	5,75
8.00	37	79	0.2	1	101050 0800	5,25
8.10	37	79	0.2	1	101050 0810	5,90

1104

D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
8.20	37	79	0.2	1	101050 0820	5,95
8.30	37	79	0.2	1	101050 0830	8,30
8.40	37	79	0.2	1	101050 0840	8,10
8.50	37	79	0.21	1	101050 0850	5,90
8.60	40	84	0.21	1	101050 0860	9,60
8.70	40	84	0.21	1	101050 0870	8,75
8.80	40	84	0.21	1	101050 0880	9,10
8.90	40	84	0.21	1	101050 0890	27,70
9.00	40	84	0.21	1	101050 0900	6,30
9.10	40	84	0.21	1	101050 0910	12,15
9.20	40	84	0.21	1	101050 0920	9,65
9.30	40	84	0.21	1	101050 0930	9,30
9.40	40	84	0.21	1	101050 0940	12,15
9.50	40	84	0.22	1	101050 0950	7,05
9.60	43	89	0.22	1	101050 0960	11,-
9.70	43	89	0.22	1	101050 0970	11,10
9.80	43	89	0.22	1	101050 0980	10,-
10.00	43	89	0.22	1	101050 1000	7,30
10.20	43	89	0.22	1	101050 1020	8,-
10.50	43	89	0.23	1	101050 1050	8,35
11.00	47	95	0.23	1	101050 1100	9,75
11.50	47	95	0.24	1	101050 1150	16,30
11.80	47	95	0.24	1	101050 1180	26,90
12.00	51	102	0.24	1	101050 1200	11,30
12.50	51	102	0.25	1	101050 1250	20,40
13.00	51	102	0.25	1	101050 1300	12,85
13.50	54	107	0.26	1	101050 1350	14,85
13.80	54	107	0.26	1	101050 1380	45,40
14.00	54	107	0.26	1	101050 1400	14,80
14.50	56	111	0.27	1	101050 1450	16,30
15.00	56	111	0.27	1	101050 1500	16,90
15.50	58	115	0.28	1	101050 1550	27,-
15.75	58	115	0.28	1	101050 1575	28,40
16.00	58	115	0.28	1	101050 1600	18,05
16.50	60	119	0.28	1	101050 1650	38,70
17.00	60	119	0.29	1	101050 1700	41,70
17.50	62	123	0.29	1	101050 1750	45,40
17.75	62	123	0.29	1	101050 1775	67,20
18.00	62	123	0.3	1	101050 1800	41,40
18.50	64	127	0.3	1	101050 1850	49,80
19.00	64	127	0.3	1	101050 1900	45,30
19.50	66	131	0.31	1	101050 1950	67,70
19.75	66	131	0.31	1	101050 1975	86,50
20.00	66	131	0.31	1	101050 2000	52,40
21.00	68	136	0.32	1	101050 2100	56,-
22.00	70	141	0.33	1	101050 2200	52,40
25.00	75	151	0.35	1	101050 2500	64,60
27.00	81	162	0.28	1	101050 2700	245,-

1104



... with brainpower.

**ATORN**<sup>®</sup>  
Performance demands quality



# ATORN® Twist drill bit

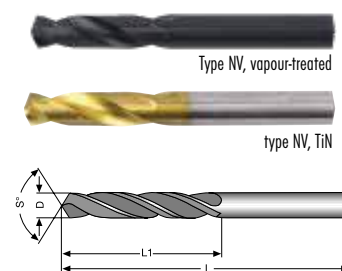
HSS-E
DIN 1897
Typ NV
130°
27°
h8
3xD
Z 2
Vap.
TiN
Vc/fz
363
364

- S° = point angle 130° (self-centring)
- 101055.... vapour-treated from Ø 2.4 mm
- 101051.... TiN-coated

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
101055....	○	●	●	●	●	●		●	●	○	○	○	○	○	○					
101051....	○	●	●	●	●	●		●	●	○	○	○	○	○	○		○			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	vap. art.no.	€	TiN art.no.	€
1.00	26	6	0.04	10 101055 0100	2,50	10 101051 0100	6,75
1.10	28	7	0.04	10 101055 0110	2,50	10 101051 0110	7,20
1.20	30	8	0.04	10 101055 0120	2,30	10 101051 0120	7,40
1.30	30	8	0.04	10 101055 0130	2,30	10 101051 0130	7,30
1.40	32	9	0.04	10 101055 0140	2,30	10 101051 0140	7,30
1.50	32	9	0.04	10 101055 0150	2,30	10 101051 0150	7,15
1.60	34	10	0.04	10 101055 0160	2,93	10 101051 0160	7,15
1.70	34	10	0.04	10 101055 0170	2,93	10 101051 0170	7,15
1.80	36	11	0.04	10 101055 0180	2,93	10 101051 0180	7,10
1.90	36	11	0.04	10 101055 0190	2,93	10 101051 0190	7,10
2.00	38	12	0.04	10 101055 0200	2,93	10 101051 0200	6,25
2.10	38	12	0.04	10 101055 0210	3,01	10 101051 0210	6,95
2.20	40	13	0.04	10 101055 0220	3,01	10 101051 0220	6,95
2.30	40	13	0.04	10 101055 0230	3,01	10 101051 0230	7,20
2.40	43	14	0.04	10 101055 0240	3,01	10 101051 0240	7,15
2.50	43	14	0.09	10 101055 0250	3,01	10 101051 0250	6,95
2.60	43	14	0.09	10 101055 0260	3,01	10 101051 0260	7,30
2.70	46	16	0.09	10 101055 0270	3,01	10 101051 0270	7,30
2.80	46	16	0.09	10 101055 0280	3,01	10 101051 0280	7,30
2.90	46	16	0.09	10 101055 0290	3,01	10 101051 0290	7,30
3.00	46	16	0.09	10 101055 0300	3,01	10 101051 0300	6,65
3.10	49	18	0.09	10 101055 0310	3,10	10 101051 0310	7,20
3.20	49	18	0.09	10 101055 0320	3,10	10 101051 0320	7,20
3.30	49	18	0.09	10 101055 0330	3,10	10 101051 0330	7,20
3.40	52	20	0.09	10 101055 0340	3,10	10 101051 0340	7,80
3.50	52	20	0.09	10 101055 0350	3,10	10 101051 0350	6,75
3.60	52	20	0.09	10 101055 0360	3,62	10 101051 0360	7,80
3.70	52	20	0.09	10 101055 0370	3,62	10 101051 0370	7,80
3.80	55	22	0.09	10 101055 0380	3,62	10 101051 0380	7,80
3.90	55	22	0.09	10 101055 0390	3,62	10 101051 0390	7,80
4.00	55	22	0.09	10 101055 0400	3,96	10 101051 0400	7,05
4.10	55	22	0.09	10 101055 0410	4,63	10 101051 0410	7,45
4.20	55	22	0.09	10 101055 0420	4,63	10 101051 0420	7,45
4.30	58	24	0.09	10 101055 0430	4,63	10 101051 0430	8,90
4.40	58	24	0.09	10 101055 0440	5,10	10 101051 0440	8,90
4.50	58	24	0.09	10 101055 0450	5,10	10 101051 0450	7,40
4.60	58	24	0.09	10 101055 0460	5,10	10 101051 0460	9,35
4.70	58	24	0.09	10 101055 0470	5,10	10 101051 0470	9,40
4.80	62	26	0.09	10 101055 0480	5,20	10 101051 0480	9,45
4.90	62	26	0.09	10 101055 0490	5,20	10 101051 0490	9,45
5.00	62	26	0.09	10 101055 0500	5,20	10 101051 0500	8,-
5.10	62	26	0.13	10 101055 0510	4,97	10 101051 0510	9,65
5.20	62	26	0.13	10 101055 0520	5,75	10 101051 0520	9,75



1104

1104

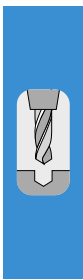
Continued on next page >>>

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	vap.			TiN		
				☒	art.no.	€	☒	art.no.	€
5.30	62	26	0.13	10	101055 0530	5,75	10	101051 0530	9,90
5.40	66	28	0.13	10	101055 0540	5,45	10	101051 0540	10,90
5.50	66	28	0.13	10	101055 0550	5,75	10	101051 0550	8,50
5.60	66	28	0.13	10	101055 0560	5,90	10	101051 0560	10,90
5.70	66	28	0.13	10	101055 0570	5,90	10	101051 0570	10,90
5.80	66	28	0.13	10	101055 0580	5,90	10	101051 0580	10,90
5.90	66	28	0.13	10	101055 0590	6,65	10	101051 0590	10,90
6.00	66	28	0.13	10	101055 0600	6,65	10	101051 0600	8,90
6.10	70	31	0.13	1	101055 0610	6,65	1	101051 0610	13,95
6.20	70	31	0.13	1	101055 0620	6,65	1	101051 0620	13,95
6.30	70	31	0.13	1	101055 0630	7,-	1	101051 0630	13,95
6.40	70	31	0.13	1	101055 0640	7,-	1	101051 0640	14,15
6.50	70	31	0.13	1	101055 0650	7,30	1	101051 0650	11,20
6.60	70	31	0.13	1	101055 0660	7,60	1	101051 0660	14,10
6.70	70	31	0.13	1	101055 0670	7,80	1	101051 0670	14,50
6.80	74	34	0.13	1	101055 0680	7,80	1	101051 0680	15,25
6.90	74	34	0.13	1	101055 0690	7,80	1	101051 0690	15,25
7.00	74	34	0.13	1	101055 0700	8,50	1	101051 0700	13,50
7.10	74	34	0.13	1	101055 0710	8,50	1	101051 0710	16,95
7.20	74	34	0.13	1	101055 0720	8,50	1	101051 0720	16,95
7.30	74	34	0.13	1	101055 0730	8,50	1	101051 0730	16,95
7.40	74	34	0.13	1	101055 0740	8,50	1	101051 0740	16,95
7.50	74	34	0.13	1	101055 0750	8,50	1	101051 0750	13,90
7.60	79	37	0.13	1	101055 0760	9,15	1	101051 0760	19,25
7.70	79	37	0.13	1	101055 0770	9,15	1	101051 0770	18,75
7.80	79	37	0.13	1	101055 0780	9,15	1	101051 0780	18,75
7.90	79	37	0.13	1	101055 0790	9,15	1	101051 0790	18,75
8.00	79	37	0.13	1	101055 0800	9,65	1	101051 0800	14,50
8.10	79	37	0.18	1	101055 0810	9,65	1	101051 0810	19,35
8.20	79	37	0.18	1	101055 0820	9,65	1	101051 0820	19,35
8.30	79	37	0.18	1	101055 0830	9,65	1	101051 0830	19,35
8.40	79	37	0.18	1	101055 0840	10,25	1	101051 0840	19,35
8.50	79	37	0.18	1	101055 0850	10,25	1	101051 0850	16,95
8.60	84	40	0.18	1	101055 0860	10,45	1	101051 0860	20,10
8.70	84	40	0.18	1	101055 0870	10,45	1	101051 0870	20,10
8.80	84	40	0.18	1	101055 0880	11,45	1	101051 0880	20,10
8.90	84	40	0.18	1	101055 0890	11,45	1	101051 0890	21,-
9.00	84	40	0.18	1	101055 0900	11,45	1	101051 0900	16,75
9.10	84	40	0.18	1	101055 0910	11,75	1	101051 0910	26,60
9.20	84	40	0.18	1	101055 0920	11,75	1	101051 0920	26,60
9.30	84	40	0.18	1	101055 0930	12,50	1	101051 0930	26,60
9.40	84	40	0.18	1	101055 0940	12,50	1	101051 0940	26,60
9.50	84	40	0.18	1	101055 0950	12,50	1	101051 0950	23,70
9.60	89	43	0.18	1	101055 0960	13,50	1	101051 0960	29,-
9.70	89	43	0.18	1	101055 0970	13,50	1	101051 0970	29,-
9.80	89	43	0.18	1	101055 0980	13,95	1	101051 0980	29,-
9.90	89	43	0.18	1	101055 0990	13,95	1	101051 0990	29,-
10.00	89	43	0.18	1	101055 1000	13,95	1	101051 1000	21,20
10.20	89	43	0.18	1	101055 1020	14,35	1	101051 1020	28,10
10.50	89	43	0.18	1	101055 1050	15,45	1	101051 1050	27,60
11.00	95	47	0.18	1	101055 1100	15,45	1	101051 1100	27,60
11.50	95	47	0.18	1	101055 1150	17,05	1	101051 1150	29,30
11.80	95	47	0.18	1	101055 1180	18,75			
12.00	102	51	0.18	1	101055 1200	20,90	1	101051 1200	33,70
12.50	102	51	0.22	1	101055 1250	23,80	1	101051 1250	34,20
13.00	102	51	0.22	1	101055 1300	24,90	1	101051 1300	35,60
13.50	107	54	0.22	1	101055 1350	32,60	1	101051 1350	38,80
13.80	107	54	0.22	1	101055 1380	33,50			
14.00	107	54	0.22	1	101055 1400	31,-	1	101051 1400	40,-
14.50	111	56	0.22	1	101055 1450	32,80	1	101051 1450	42,30

1104

1104

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	vap.		☒	TiN	
					art.no.	€		art.no.	€
15.00	111	56	0.22	1	101055 1500	33,60	1	101051 1500	42,30
15.50	115	58	0.22	1	101055 1550	37,80	1	101051 1550	55,10
15.75	115	58	0.22	1	101055 1575	49,10	1	101051 1575	56,50
16.00	115	58	0.22	1	101055 1600	39,40	1	101051 1600	59,60
16.50	119	60	0.28	1	101055 1650	75,80	1	101051 1650	84,30
17.00	119	60	0.28	1	101055 1700	73,40	1	101051 1700	81,60
17.50	123	62	0.28	1	101055 1750	74,40	1	101051 1750	77,70
17.75	123	62	0.28	1	101055 1775	97,20	1	101051 1775	96,20
18.00	123	62	0.28	1	101055 1800	77,70	1	101051 1800	89,—
18.50	127	64	0.28	1	101055 1850	94,90	1	101051 1850	99,70
19.00	127	64	0.28	1	101055 1900	96,60	1	101051 1900	97,40
19.50	131	66	0.28	1	101055 1950	106,—	1	101051 1950	110,50
19.75	131	66	0.28	1	101055 1975	111,—	1	101051 1975	110,50
20.00	131	66	0.28	1	101055 2000	98,70	1	101051 2000	105,—
					1104		1104		



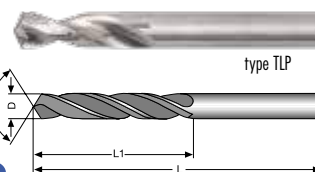
### ATORN® Twist drill bit

HSS-E
DIN 1897
Typ TLP
130°
38°
h8
3xD
Z 2
i Vc/tz 363

- S° = point angle 130° (self-centring)
- Type TLP, uncoated

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		30	20	10	15	12		30	30				70	50	45	10			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	vap.	
					art.no.	€
1.00	26	6	0.04	10	101052 0100	2,92
1.10	28	7	0.04	10	101052 0110	5,30
1.20	30	8	0.04	10	101052 0120	5,30
1.30	30	8	0.04	10	101052 0130	5,30
1.40	32	9	0.04	10	101052 0140	3,84
1.50	32	9	0.04	10	101052 0150	2,97
1.60	34	10	0.04	10	101052 0160	2,97
1.70	34	10	0.04	10	101052 0170	5,25
1.80	36	11	0.04	10	101052 0180	3,89
1.90	36	11	0.04	10	101052 0190	7,90
2.00	38	12	0.04	10	101052 0200	3,11
2.10	38	12	0.04	10	101052 0210	5,25
2.20	40	13	0.04	10	101052 0220	3,16
2.30	40	13	0.04	10	101052 0230	5,25
2.40	43	14	0.04	10	101052 0240	3,16
2.50	43	14	0.09	10	101052 0250	3,16
2.60	43	14	0.09	10	101052 0260	3,16
2.70	46	16	0.09	10	101052 0270	3,21
2.80	46	16	0.09	10	101052 0280	3,21
2.90	46	16	0.09	10	101052 0290	3,54
3.00	46	16	0.09	10	101052 0300	3,16
3.10	49	18	0.09	10	101052 0310	3,21
3.20	49	18	0.09	10	101052 0320	3,21
3.30	49	18	0.09	10	101052 0330	3,27
					1104	

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	vap.	
					art.no.	€
3.40	52	20	0.09	10	101052 0340	3,60
3.50	52	20	0.09	10	101052 0350	3,54
3.60	52	20	0.09	10	101052 0360	3,60
3.70	52	20	0.09	10	101052 0370	3,94
3.80	55	22	0.09	10	101052 0380	3,94
3.90	55	22	0.09	10	101052 0390	6,15
4.00	55	22	0.09	10	101052 0400	3,84
4.10	55	22	0.09	10	101052 0410	3,94
4.20	55	22	0.09	10	101052 0420	3,94
4.30	58	24	0.09	10	101052 0430	3,99
4.40	58	24	0.09	10	101052 0440	4,28
4.50	58	24	0.09	10	101052 0450	3,94
4.60	58	24	0.09	10	101052 0460	6,45
4.70	58	24	0.09	10	101052 0470	5,95
4.80	62	26	0.09	10	101052 0480	6,35
4.90	62	26	0.09	10	101052 0490	5,10
5.00	62	26	0.09	10	101052 0500	4,11
5.10	62	26	0.13	10	101052 0510	4,28
5.20	62	26	0.13	10	101052 0520	10,20
5.30	62	26	0.13	10	101052 0530	4,67
5.40	66	28	0.13	10	101052 0540	10,30
5.50	66	28	0.13	10	101052 0550	4,51
5.60	66	28	0.13	10	101052 0560	7,15
5.70	66	28	0.13	10	101052 0570	6,90
					1104	

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
5.80	66	28	0.13	10	101052 0580	5,10
5.90	66	28	0.13	10	101052 0590	7,20
6.00	66	28	0.13	1	101052 0600	5,10
6.10	70	31	0.13	1	101052 0610	5,70
6.20	70	31	0.13	1	101052 0620	4,90
6.30	70	31	0.13	1	101052 0630	10,-
6.40	70	31	0.13	1	101052 0640	10,40
6.50	70	31	0.13	1	101052 0650	5,55
6.60	70	31	0.13	1	101052 0660	7,45
6.70	70	31	0.13	1	101052 0670	7,45
6.80	74	34	0.13	1	101052 0680	7,45
6.90	74	34	0.13	1	101052 0690	7,45
7.00	74	34	0.13	1	101052 0700	7,45
7.10	74	34	0.13	1	101052 0710	9,95
7.20	74	34	0.13	1	101052 0720	7,90
7.30	74	34	0.13	1	101052 0730	9,10
7.40	74	34	0.13	1	101052 0740	11,45
7.50	74	34	0.13	1	101052 0750	7,65
7.60	79	37	0.13	1	101052 0760	11,45
7.70	79	37	0.13	1	101052 0770	11,55
7.80	79	37	0.13	1	101052 0780	10,15
7.90	79	37	0.13	1	101052 0790	12,55
8.00	79	37	0.13	1	101052 0800	8,10
8.10	79	37	0.18	1	101052 0810	8,40
8.20	79	37	0.18	1	101052 0820	8,40
8.30	79	37	0.18	1	101052 0830	8,40
8.40	79	37	0.18	1	101052 0840	9,70
8.50	79	37	0.18	1	101052 0850	8,50
8.60	84	40	0.18	1	101052 0860	9,85
8.70	84	40	0.18	1	101052 0870	9,85
8.80	84	40	0.18	1	101052 0880	11,45
8.90	84	40	0.18	1	101052 0890	12,65
9.00	84	40	0.18	1	101052 0900	10,15

1104

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
9.10	84	40	0.18	1	101052 0910	10,40
9.20	84	40	0.18	1	101052 0920	14,-
9.30	84	40	0.18	1	101052 0930	10,80
9.40	84	40	0.18	1	101052 0940	10,80
9.50	84	40	0.18	1	101052 0950	10,40
9.60	89	43	0.18	1	101052 0960	14,15
9.70	89	43	0.18	1	101052 0970	14,60
9.80	89	43	0.18	1	101052 0980	11,90
9.90	89	43	0.18	1	101052 0990	14,50
10.00	89	43	0.18	1	101052 1000	12,45
10.20	89	43	0.18	1	101052 1020	15,70
10.50	89	43	0.18	1	101052 1050	15,70
11.00	95	47	0.18	1	101052 1100	18,35
11.50	95	47	0.18	1	101052 1150	18,35
11.80	95	47	0.18	1	101052 1180	26,20
12.00	102	51	0.18	1	101052 1200	21,80
12.50	102	51	0.22	1	101052 1250	23,20
13.00	102	51	0.22	1	101052 1300	30,90
13.50	107	54	0.22	1	101052 1350	32,-
14.00	107	54	0.22	1	101052 1400	33,90
14.50	111	56	0.22	1	101052 1450	35,50
15.00	111	56	0.22	1	101052 1500	35,70
15.50	115	58	0.22	1	101052 1550	41,40
16.00	115	58	0.22	1	101052 1600	42,40
16.50	119	60	0.28	1	101052 1650	66,70
17.00	119	60	0.28	1	101052 1700	54,50
17.50	123	62	0.28	1	101052 1750	57,50
18.00	123	62	0.28	1	101052 1800	73,30
18.50	127	64	0.28	1	101052 1850	74,80
19.00	127	64	0.28	1	101052 1900	74,30
19.50	131	66	0.28	1	101052 1950	95,10
20.00	131	66	0.28	1	101052 2000	86,50

1104

### ATORN® KSB-3D twist drill

HSS-E PM
DIN 1897
118°

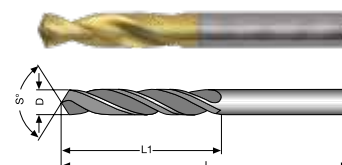
38°
h8
3xD
Z 2
TiN

364

- Low wear on cutting edges
- Especially resistant to high temperatures
- **Extended service life**
- Excellent chip removal
- **Short chips**

material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
			< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
			50	35	15	12	10		45	40	12	12	12	90	80	80	15			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1.00	26	6	0.03	101085 0100	11,20
1.10	28	7	0.03	101085 0110	11,20
1.20	30	8	0.03	101085 0120	11,90

1106

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1.30	30	8	0.03	101085 0130	12,35
1.40	32	9	0.03	101085 0140	12,60
1.50	32	9	0.03	101085 0150	11,40

1106

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1.60	34	10	0.03	101085 0160	11,-
1.70	34	10	0.03	101085 0170	11,-
1.80	36	11	0.03	101085 0180	11,20
1.90	36	11	0.03	101085 0190	11,-
2.00	38	12	0.03	101085 0200	8,95
2.10	38	12	0.03	101085 0210	10,35
2.20	40	13	0.04	101085 0220	11,20
2.30	40	13	0.04	101085 0230	11,20
2.40	43	14	0.04	101085 0240	11,65
2.50	43	14	0.04	101085 0250	9,95
2.60	43	14	0.04	101085 0260	11,65
2.70	46	16	0.04	101085 0270	11,20
2.80	46	16	0.04	101085 0280	12,35
2.90	46	16	0.04	101085 0290	10,80
3.00	46	16	0.04	101085 0300	11,40
3.10	49	18	0.04	101085 0310	11,65
3.20	49	18	0.04	101085 0320	11,90
3.30	49	18	0.05	101085 0330	11,65
3.40	52	20	0.05	101085 0340	12,15
3.50	52	20	0.05	101085 0350	12,15
3.60	52	20	0.05	101085 0360	12,60
3.70	52	20	0.06	101085 0370	13,05
3.80	55	22	0.06	101085 0380	13,25
3.90	55	22	0.06	101085 0390	13,70
4.00	55	22	0.06	101085 0400	13,70
4.10	55	22	0.06	101085 0410	14,10
4.20	55	22	0.07	101085 0420	14,30
4.30	58	24	0.07	101085 0430	15,05
4.40	58	24	0.07	101085 0440	15,70
4.50	58	24	0.07	101085 0450	15,50
4.60	58	24	0.08	101085 0460	16,40
4.70	58	24	0.08	101085 0470	16,80
4.80	62	26	0.08	101085 0480	17,20
4.90	62	26	0.08	101085 0490	17,70
5.00	62	26	0.08	101085 0500	17,70
5.10	62	26	0.09	101085 0510	27,60
5.20	62	26	0.09	101085 0520	28,40
5.30	62	26	0.09	101085 0530	29,20
5.40	66	28	0.09	101085 0540	30,10
5.50	66	28	0.11	101085 0550	19,85
5.60	66	28	0.11	101085 0560	31,30
5.70	66	28	0.11	101085 0570	32,10
5.80	66	28	0.11	101085 0580	32,30
5.90	66	28	0.11	101085 0590	33,-

1106

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
6.00	66	28	0.11	101085 0600	22,40
6.10	70	31	0.11	101085 0610	35,-
6.20	70	31	0.11	101085 0620	35,-
6.30	70	31	0.11	101085 0630	35,80
6.40	70	31	0.12	101085 0640	36,90
6.50	70	31	0.12	101085 0650	24,90
6.60	70	31	0.12	101085 0660	38,20
6.70	70	31	0.12	101085 0670	39,-
6.80	74	34	0.12	101085 0680	38,60
6.90	74	34	0.13	101085 0690	40,40
7.00	74	34	0.13	101085 0700	26,70
7.10	74	34	0.13	101085 0710	42,-
7.20	74	34	0.13	101085 0720	42,30
7.30	74	34	0.14	101085 0730	42,90
7.40	74	34	0.14	101085 0740	43,80
7.50	74	34	0.14	101085 0750	30,30
7.60	79	37	0.14	101085 0760	44,90
7.70	79	37	0.14	101085 0770	46,-
7.80	79	37	0.15	101085 0780	47,-
7.90	79	37	0.15	101085 0790	48,30
8.00	79	37	0.15	101085 0800	32,10
8.10	79	37	0.15	101085 0810	49,40
8.20	79	37	0.15	101085 0820	50,10
8.30	79	37	0.15	101085 0830	50,90
8.40	79	37	0.15	101085 0840	51,90
8.50	79	37	0.15	101085 0850	34,40
8.80	84	40	0.16	101085 0880	55,-
9.00	84	40	0.16	101085 0900	37,10
9.30	84	40	0.16	101085 0930	60,10
9.50	84	40	0.16	101085 0950	40,80
9.80	89	43	0.16	101085 0980	64,60
10.00	89	43	0.16	101085 1000	43,30
10.20	89	43	0.16	101085 1020	69,20
10.50	89	43	0.17	101085 1050	48,70
11.00	95	47	0.17	101085 1100	51,40
11.50	95	47	0.17	101085 1150	58,-
12.00	102	51	0.18	101085 1200	62,60
12.30	102	51	0.18	101085 1230	65,10
12.50	102	51	0.18	101085 1250	69,20
12.70	102	51	0.18	101085 1270	72,30
13.00	102	51	0.18	101085 1300	75,30
13.50	107	54	0.18	101085 1350	77,30
14.00	107	54	0.19	101085 1400	95,10

1106





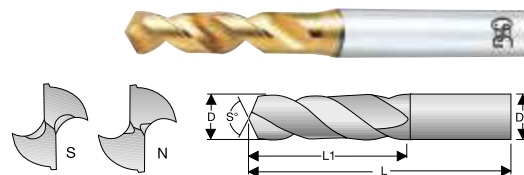
# EX-SUS-GDS twist drill bit

HSS-E V3
Werknorm
Typ VA
120°
130°
140°
35°-40°
3xD
TiN
i Vc/fz 365

- Large chip spaces, high toughness
- Reduced heat build-up
- Shank design: straight
- **From Ø 12.1 with driving plane in accordance with DIN 1835B**
- S° = point angle: < Ø 2 mm = 140°, ≤ Ø 4 mm = 130°, > Ø 4 mm = 120°
- Centring geometry: up to Ø 13 mm S version, from Ø 13.5 mm N version
- Available on request: Intermediate dimensions from Ø 0.5 to Ø 6 mm (in 0.01 mm increments)

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	6-8	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	25-50		< 55 HRc	< 60 HRc	≥ 60 HRc
		32-40	30-35		15-20	13-18	8-12			6-8			63-100	32-63					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	L mm	L1 mm	D1 mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
1.0	38	6	3	0.03	114045 0100	12,50
1.1	39	7	3	0.03	114045 0110	12,30
1.2	40	8	3	0.03	114045 0120	12,30
1.3	40	8	3	0.03	114045 0130	12,30
1.4	41	9	3	0.03	114045 0140	12,30
1.5	41	9	3	0.07	114045 0150	11,60
1.6	42	10	3	0.07	114045 0160	10,80
1.7	42	10	3	0.07	114045 0170	10,80
1.8	43	11	3	0.07	114045 0180	10,80
1.9	43	11	3	0.07	114045 0190	10,80
2.0	44	12	3	0.07	114045 0200	10,40
2.1	44	12	3	0.07	114045 0210	12,40
2.2	45	13	3	0.07	114045 0220	12,40
2.3	45	13	3	0.07	114045 0230	12,40
2.4	46	14	3	0.07	114045 0240	12,40
2.5	46	14	3	0.11	114045 0250	11,60
2.6	46	14	3	0.11	114045 0260	12,40
2.7	48	16	3	0.11	114045 0270	12,40
2.8	48	16	3	0.11	114045 0280	12,40
2.9	48	16	3	0.11	114045 0290	12,40
3.0	48	16	3	0.11	114045 0300	11,60
3.1	50	18	4	0.11	114045 0310	13,90
3.2	50	18	4	0.11	114045 0320	13,90
3.3	50	18	4	0.11	114045 0330	13,90
3.4	52	20	4	0.11	114045 0340	13,90
3.5	52	20	4	0.13	114045 0350	13,90
3.6	52	20	4	0.13	114045 0360	15,20
3.7	52	20	4	0.13	114045 0370	15,20
3.8	54	22	4	0.13	114045 0380	15,20
3.9	54	22	4	0.13	114045 0390	15,20
4.0	54	22	4	0.13	114045 0400	15,20
4.1	66	22	6	0.13	114045 0410	17,80
4.2	66	22	6	0.13	114045 0420	16,90
4.3	68	24	6	0.13	114045 0430	17,80
4.4	68	24	6	0.13	114045 0440	17,80
4.5	68	24	6	0.15	114045 0450	16,90
4.6	68	24	6	0.15	114045 0460	20,20
4.7	68	24	6	0.15	114045 0470	20,20

1107

D h8 mm	L mm	L1 mm	D1 mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
4.8	70	26	6	0.15	114045 0480	20,20
4.9	70	26	6	0.15	114045 0490	20,20
5.0	70	26	6	0.15	114045 0500	22,40
5.1	70	26	6	0.15	114045 0510	22,40
5.2	70	26	6	0.15	114045 0520	22,40
5.3	70	28	6	0.15	114045 0530	23,90
5.4	72	28	6	0.15	114045 0540	23,90
5.5	72	28	6	0.16	114045 0550	22,40
5.6	72	28	6	0.16	114045 0560	25,60
5.7	72	28	6	0.16	114045 0570	25,60
5.8	72	28	6	0.16	114045 0580	25,60
5.9	72	28	6	0.16	114045 0590	25,60
6.0	72	28	6	0.16	114045 0600	24,30
6.1	75	31	8	0.16	114045 0610	28,50
6.2	75	31	8	0.16	114045 0620	28,50
6.3	75	31	8	0.16	114045 0630	28,50
6.4	75	31	8	0.16	114045 0640	28,50
6.5	75	31	8	0.16	114045 0650	28,50
6.6	75	31	8	0.16	114045 0660	29,40
6.7	75	31	8	0.16	114045 0670	29,40
6.8	78	34	8	0.16	114045 0680	29,40
6.9	78	34	8	0.16	114045 0690	29,40
7.0	78	34	8	0.16	114045 0700	29,40
7.1	78	34	8	0.20	114045 0710	30,90
7.2	78	34	8	0.20	114045 0720	30,90
7.3	78	34	8	0.20	114045 0730	30,90
7.4	78	34	8	0.20	114045 0740	30,90
7.5	78	34	8	0.20	114045 0750	30,90
7.6	81	37	8	0.20	114045 0760	32,30
7.7	81	37	8	0.20	114045 0770	32,30
7.8	81	37	8	0.20	114045 0780	32,30
7.9	81	37	8	0.20	114045 0790	32,30
8.0	81	37	8	0.20	114045 0800	32,30
8.1	87	37	10	0.20	114045 0810	35,60
8.2	87	37	10	0.20	114045 0820	35,60
8.3	87	37	10	0.20	114045 0830	35,60
8.4	87	37	10	0.20	114045 0840	35,60
8.5	87	37	10	0.20	114045 0850	35,60

1107

D h8 mm	L mm	L1 mm	D1 mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	art.no.	€
8.6	90	40	10	0.20	114045 0860	37,10
8.7	90	40	10	0.20	114045 0870	37,10
8.8	90	40	10	0.20	114045 0880	37,10
8.9	90	40	10	0.20	114045 0890	37,10
9.0	90	40	10	0.20	114045 0900	37,10
9.1	90	40	10	0.24	114045 0910	40,20
9.2	90	40	10	0.24	114045 0920	40,20
9.3	90	40	10	0.24	114045 0930	40,20
9.4	90	40	10	0.24	114045 0940	40,20
9.5	90	40	10	0.24	114045 0950	40,20
9.6	93	43	10	0.24	114045 0960	42,40
9.7	93	43	10	0.24	114045 0970	42,40
9.8	93	43	10	0.24	114045 0980	42,40
9.9	93	43	10	0.24	114045 0990	42,40
10.0	93	43	10	0.24	114045 1000	42,40
10.1	100	43	12	0.24	114045 1010	52,60
10.2	100	43	12	0.24	114045 1020	52,60
10.3	100	43	12	0.24	114045 1030	52,60
10.4	100	43	12	0.24	114045 1040	52,60
10.5	100	43	12	0.24	114045 1050	52,60
10.6	100	43	12	0.24	114045 1060	57,60
10.7	104	47	12	0.24	114045 1070	57,60
10.8	104	47	12	0.24	114045 1080	57,60
10.9	104	47	12	0.24	114045 1090	57,60
11.0	104	47	12	0.24	114045 1100	57,60
11.1	104	47	12	0.29	114045 1110	61,90
11.2	104	47	12	0.29	114045 1120	61,90
11.3	104	47	12	0.29	114045 1130	61,90
11.4	104	47	12	0.29	114045 1140	61,90
11.5	104	47	12	0.29	114045 1150	61,90

1107

D h8 mm	L mm	L1 mm	D1 mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	art.no.	€
11.6	104	47	12	0.29	114045 1160	66,20
11.7	104	47	12	0.29	114045 1170	66,20
11.8	104	47	12	0.29	114045 1180	66,20
11.9	108	51	12	0.29	114045 1190	66,20
12.0	108	51	12	0.29	114045 1200	66,20
12.1	108	51	12	0.29	114045 1210	76,70
12.2	108	51	12	0.29	114045 1220	76,70
12.3	108	51	12	0.29	114045 1230	76,70
12.4	108	51	12	0.29	114045 1240	76,70
12.5	108	51	12	0.29	114045 1250	76,70
12.6	108	51	12	0.29	114045 1260	81,20
12.7	108	51	12	0.29	114045 1270	81,20
12.8	108	51	12	0.29	114045 1280	81,20
12.9	108	51	12	0.29	114045 1290	81,20
13.0	108	51	12	0.29	114045 1300	81,20
13.5	114	54	16	0.33	114045 1350	122,90
14.0	114	54	16	0.33	114045 1400	122,90
14.5	116	56	16	0.33	114045 1450	141,30
15.0	116	56	16	0.33	114045 1500	141,30
15.5	118	58	16	0.36	114045 1550	152,20
16.0	118	58	16	0.36	114045 1600	152,20
16.5	126	60	20	0.36	114045 1650	159,70
17.0	126	60	20	0.36	114045 1700	159,70
17.5	128	62	20	0.40	114045 1750	174,40
18.0	128	62	20	0.40	114045 1800	174,40
18.5	130	64	20	0.40	114045 1850	198,-
19.0	130	64	20	0.40	114045 1900	198,-
19.5	132	66	20	0.43	114045 1950	205,-
20.0	132	66	20	0.43	114045 2000	205,-

1107



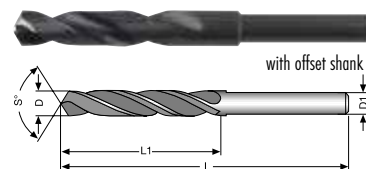
## ATORN® Twist drill bit



- **Offset uniform shank**
- Clamping and tooling benefits due to uniform length of straight shank irrespective of diameter
- **Vapour-treated**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		30	20	10	10	8		25	20	4			60	40	50	10			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



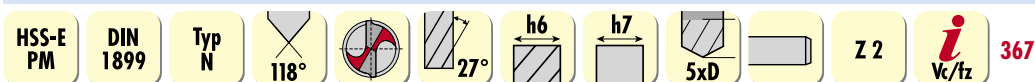
D mm	L mm	L1 mm	D1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
13.50	152	76	12.7	0.22	101080 1350	33,90
14.00	152	76	12.7	0.22	101080 1400	26,30
14.50	152	76	12.7	0.22	101080 1450	39,70
15.00	152	76	12.7	0.22	101080 1500	34,-
15.50	152	76	12.7	0.22	101080 1550	40,30
16.00	152	76	12.7	0.22	101080 1600	34,80
16.50	152	76	12.7	0.28	101080 1650	38,90
17.00	152	76	12.7	0.28	101080 1700	45,80
17.50	152	76	12.7	0.28	101080 1750	42,40
18.00	152	76	12.7	0.28	101080 1800	47,40

1104

D mm	L mm	L1 mm	D1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
18.50	152	76	12.7	0.28	101080 1850	57,-
19.00	152	76	12.7	0.28	101080 1900	59,-
19.50	152	76	12.7	0.28	101080 1950	66,20
20.00	152	76	12.7	0.28	101080 2000	57,-
21.00	152	76	12.7	0.28	101080 2100	69,20
22.00	152	76	12.7	0.28	101080 2200	72,30
23.00	152	76	12.7	0.28	101080 2300	82,40
24.00	152	76	12.7	0.28	101080 2400	82,40
25.00	152	76	12.7	0.28	101080 2500	83,40

1104

## ATORN® Micro drill



- **Reinforced shank**
- Profile-ground
- **High true-running accuracy and precision-ground point**
- Diameter tolerance 0/-0.004 mm
- HSS-E-PM for high cutting rates and high rigidity

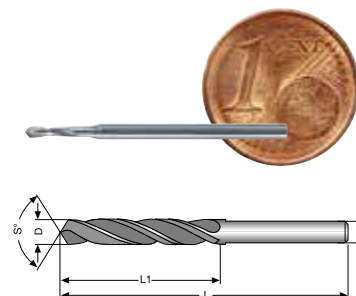
From Ø 0.05 mm

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		30	20	10	10	10		25	30	7	6	6	60	50	50	10			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

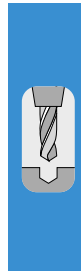
D mm	D1 mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
0.05	1.0	0.4	25	0.006	10 101075 0005	19,25
0.08	1.0	0.5	25	0.006	10 101075 0008	19,25
0.10	1.0	0.5	25	0.006	10 101075 0010	14,50
0.15	1.0	0.8	25	0.007	10 101075 0015	11,95
0.20	1.0	1.5	25	0.008	10 101075 0020	10,15
0.25	1.0	1.9	25	0.009	10 101075 0025	9,30
0.30	1.0	1.9	25	0.010	10 101075 0030	8,60
0.35	1.0	2.4	25	0.011	10 101075 0035	7,70
0.40	1.0	3	25	0.012	10 101075 0040	6,65

1101



D mm	D1 mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
0.45	1.0	3	25	0.013	10	101075 0045	7,25
0.50	1.0	3.4	25	0.014	10	101075 0050	6,45
0.55	1.0	3.9	25	0.015	10	101075 0055	6,70
0.60	1.0	3.9	25	0.016	10	101075 0060	5,95
0.65	1.0	4.2	25	0.017	10	101075 0065	6,70
0.70	1.0	4.8	25	0.018	10	101075 0070	5,85
0.75	1.0	4.8	25	0.019	10	101075 0075	6,65
0.80	1.5	5.3	25	0.022	10	101075 0080	6,10
0.85	1.5	5.3	25	0.025	10	101075 0085	6,70
0.90	1.5	6	25	0.028	10	101075 0090	6,10
0.95	1.5	6	25	0.031	10	101075 0095	6,90
1.00	1.5	6.8	25	0.034	10	101075 0100	6,10
1.10	1.5	7.6	25	0.037	10	101075 0110	6,65
1.20	1.5	8.5	25	0.040	10	101075 0120	6,65
1.30	1.5	8.5	25	0.043	10	101075 0130	6,70
1.40	1.5	9.5	25	0.046	10	101075 0140	6,70
1.50	2.0	9.5	25	0.049	10	101075 0150	10,-

1101



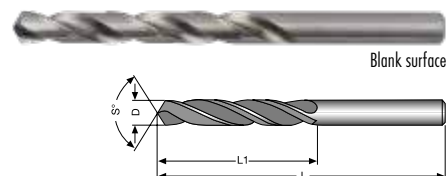
**SARA® Twist drill bit**

HSS
DIN 338
Typ N
118°
27°
h8
5xD
Z 2
i Vc/tz
366

• sima felület, csiszolt, gyártáshoz

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	G6/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		30	20					20				40		35					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L mm	L1 mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
0.4	20	5	0.03	10	101002 0040	2,06
0.5	22	6	0.03	10	101002 0050	1,83
0.6	24	7	0.03	10	101002 0060	1,81
0.7	28	9	0.03	10	101002 0070	1,69
0.8	30	10	0.03	10	101002 0080	1,63
0.9	32	11	0.03	10	101002 0090	1,48
1.0	34	12	0.04	10	101002 0100	1,30
1.1	36	14	0.04	10	101002 0110	1,25
1.2	38	16	0.04	10	101002 0120	1,25
1.3	38	16	0.04	10	101002 0130	1,25
1.4	40	18	0.04	10	101002 0140	1,25
1.5	40	18	0.04	10	101002 0150	1,05
1.6	43	20	0.04	10	101002 0160	1,03
1.7	43	20	0.04	10	101002 0170	1,25
1.8	46	22	0.04	10	101002 0180	0,94
1.9	46	22	0.04	10	101002 0190	0,95
2.0	49	24	0.04	10	101002 0200	0,79
2.1	49	24	0.04	10	101002 0210	0,94
2.2	53	27	0.04	10	101002 0220	0,95

1137

D mm	L mm	L1 mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
2.3	53	27	0.04	10	101002 0230	0,95
2.4	57	30	0.04	10	101002 0240	0,99
2.5	57	30	0.09	10	101002 0250	0,99
2.6	57	30	0.09	10	101002 0260	1,03
2.7	61	33	0.09	10	101002 0270	1,03
2.8	61	33	0.09	10	101002 0280	1,03
2.9	61	33	0.09	10	101002 0290	1,03
3.0	61	33	0.09	10	101002 0300	0,90
3.1	65	36	0.09	10	101002 0310	1,06
3.2	65	36	0.09	10	101002 0320	1,06
3.3	65	36	0.09	10	101002 0330	1,07
3.4	70	39	0.09	10	101002 0340	1,06
3.5	70	39	0.09	10	101002 0350	1,02
3.6	70	39	0.09	10	101002 0360	1,16
3.7	70	39	0.09	10	101002 0370	1,25
3.8	75	43	0.09	10	101002 0380	1,25
3.9	75	43	0.09	10	101002 0390	1,25
4.0	75	43	0.09	10	101002 0400	1,03
4.1	75	43	0.09	10	101002 0410	1,40

1137

Continued on next page >>>

D mm	L mm	L1 mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
4.2	75	43	0.09	10	101002 0420	1,25
4.3	80	47	0.09	10	101002 0430	1,42
4.4	80	47	0.09	10	101002 0440	1,42
4.5	80	47	0.09	10	101002 0450	1,31
4.6	80	47	0.09	10	101002 0460	1,42
4.7	80	47	0.09	10	101002 0470	1,43
4.8	86	52	0.09	10	101002 0480	1,43
4.9	86	52	0.09	10	101002 0490	1,52
5.0	86	52	0.09	10	101002 0500	1,30
5.1	86	52	0.13	10	101002 0510	1,65
5.2	86	52	0.13	10	101002 0520	1,65
5.3	86	52	0.13	10	101002 0530	1,65
5.4	93	57	0.13	10	101002 0540	1,86
5.5	93	57	0.13	10	101002 0550	1,73
5.6	93	57	0.13	10	101002 0560	1,87
5.7	93	57	0.13	10	101002 0570	1,89
5.8	93	57	0.13	10	101002 0580	1,92
5.9	93	57	0.13	10	101002 0590	1,96
6.0	93	57	0.13	10	101002 0600	1,68
6.1	101	63	0.13	1	101002 0610	2,11
6.2	101	63	0.13	1	101002 0620	2,11
6.3	101	63	0.13	1	101002 0630	2,14
6.4	101	63	0.13	1	101002 0640	2,30
6.5	101	63	0.13	1	101002 0650	2,14
6.6	101	63	0.13	1	101002 0660	2,43
6.7	101	63	0.13	1	101002 0670	2,43
6.8	109	69	0.13	1	101002 0680	2,84
6.9	109	69	0.13	1	101002 0690	2,84
7.0	109	69	0.13	1	101002 0700	2,55
7.1	109	69	0.13	1	101002 0710	2,88
7.2	109	69	0.13	1	101002 0720	3,02
7.3	109	69	0.13	1	101002 0730	3,02
7.4	109	69	0.13	1	101002 0740	3,09
7.5	109	69	0.13	1	101002 0750	2,84
7.6	117	75	0.13	1	101002 0760	3,30
7.7	117	75	0.13	1	101002 0770	3,30
7.8	117	75	0.13	1	101002 0780	3,36
7.9	117	75	0.13	1	101002 0790	3,39
8.0	117	75	0.13	1	101002 0800	2,84
8.1	117	75	0.18	1	101002 0810	3,55
8.2	117	75	0.18	1	101002 0820	3,55
8.3	117	75	0.18	1	101002 0830	3,86
8.4	117	75	0.18	1	101002 0840	3,86
8.5	117	75	0.18	1	101002 0850	3,66
8.6	125	81	0.18	1	101002 0860	4,28

1137

D mm	L mm	L1 mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
8.7	125	81	0.18	1	101002 0870	4,28
8.8	125	81	0.18	1	101002 0880	4,38
8.9	125	81	0.18	1	101002 0890	4,55
9.0	125	81	0.18	1	101002 0900	4,02
9.1	125	81	0.18	1	101002 0910	4,55
9.2	125	81	0.18	1	101002 0920	4,55
9.3	125	81	0.18	1	101002 0930	4,58
9.4	125	81	0.18	1	101002 0940	4,58
9.5	125	81	0.18	1	101002 0950	4,57
9.6	133	87	0.18	1	101002 0960	5,15
9.7	133	87	0.18	1	101002 0970	5,15
9.8	133	87	0.18	1	101002 0980	5,75
9.9	133	87	0.18	1	101002 0990	5,75
10.0	133	87	0.18	1	101002 1000	4,89
10.1	133	87	0.18	1	101002 1010	6,20
10.2	133	87	0.18	1	101002 1020	6,35
10.3	133	87	0.18	1	101002 1030	7,35
10.4	133	87	0.18	1	101002 1040	7,35
10.5	133	87	0.18	1	101002 1050	6,50
10.6	133	87	0.18	1	101002 1060	8,30
10.7	142	94	0.18	1	101002 1070	8,80
10.8	142	94	0.18	1	101002 1080	8,90
10.9	142	94	0.18	1	101002 1090	8,80
11.0	142	94	0.18	1	101002 1100	7,65
11.1	142	94	0.18	1	101002 1110	9,15
11.2	142	94	0.18	1	101002 1120	9,65
11.3	142	94	0.18	1	101002 1130	9,15
11.4	142	94	0.18	1	101002 1140	8,80
11.5	142	94	0.18	1	101002 1150	8,35
11.6	142	94	0.18	1	101002 1160	11,45
11.7	142	94	0.18	1	101002 1170	11,45
11.8	142	94	0.18	1	101002 1180	10,70
11.9	151	101	0.18	1	101002 1190	11,45
12.0	151	101	0.18	1	101002 1200	9,25
12.2	151	101	0.22	1	101002 1220	12,30
12.5	151	101	0.22	1	101002 1250	10,45
12.8	151	101	0.22	1	101002 1280	13,40
13.0	151	101	0.22	1	101002 1300	11,45
13.5	160	108	0.22	1	101002 1350	13,45
14.0	160	108	0.22	1	101002 1400	16,70
14.5	169	114	0.22	1	101002 1450	16,60
15.0	169	114	0.22	1	101002 1500	20,30
15.5	178	120	0.22	1	101002 1550	20,30
16.0	178	120	0.22	1	101002 1600	21,80

1137

# THE COMPLETE MACHINING RANGE



**PALBIT**  
Machining tools  
411 pages  
Art.no. 019900 0315

Overview of all free manufacturers' catalogues  
on page 16/17



**SARA® Twist drill bit sets**

HSS
DIN 338
Typ N
118°
27°
h8
5xD
Z 2
i Vc/fz
366

• Bright surface, ground, for production



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 30	● 20					○ 20					○ 40		○ 35					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

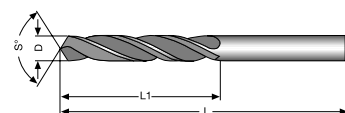
D mm	Number of drills	art.no.	€
Ø 1.0 to 5.9 mm in 0.1 mm increments	50	101033 0001	82,70
Ø 6.0 to 10.0 mm in 0.1 mm increments	41	101033 0002	193,50
Ø 1.0 to 10.0 mm in 0.5 mm increments	19	101033 0003	50,40
Ø 1.0 to 13.0 mm in 0.5 mm increments	25	101033 0004	105,-
Ø 1.0 to 10.5 mm in 0.5 mm increments with the following additional dimensions for threaded bores: Ø 3.3-4.2-6.8-10.2 mm	24	101033 0005	77,10

1137

**ATORN® SARA® Twist drill bit**

HSS
DIN 338
Typ N
118°
27°
h8
5xD
Z 2
TiN
Vap.
i Vc/fz
366

- 101005.... profile-ground, vapour-treated from Ø 2.4 mm, point thinning from Ø ≥ 1 mm
- 101405.... profile-ground, vapour-treated from Ø 2.4 mm, point thinning from Ø ≥ 1 mm
- 101008.... TiN head coating, bare chip flute, point thinning from Ø ≥ 1 mm



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
101005....		● 30	○ 20		○ 10			● 25	○ 25				○ 45	○ 50	○ 40	○ 10			
101405....		● 25	● 15					● 25	○ 20				○ 45	○ 35	○ 30				
101008....		● 30	○ 20		○ 10				○ 25				○ 45	○ 50	○ 40	○ 10			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



Single		●		ATORN®		SARA®		ATORN®	
D mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	Vapour-treated art.no.	€	Vapour-treated art.no.	€	TiN art.no.	€
0.40	5	20	0.03	10 101005 0040	3,77				
0.50	6	22	0.03	10 101005 0050	2,98	10 101405 0050	1,40		
0.60	7	24	0.03	10 101005 0060	2,95	10 101405 0060	1,40		
0.70	9	28	0.03	10 101005 0070	2,76	10 101405 0070	1,40		
0.80	10	30	0.03	10 101005 0080	2,52	10 101405 0080	1,40		
0.90	11	32	0.03	10 101005 0090	2,49	10 101405 0090	1,40		
1.00	12	34	0.03	10 101005 0100	2,28	10 101405 0100	1,46	10 101008 0100	2,72

1104

1137

1104

Continued on next page >>>

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	ATORN®		SARA®		ATORN®	
				☒	Vapour-treated art.no. €	☒	Vapour-treated art.no. €	☒	TiN art.no. €
1.10	14	36	0.04	10	101005 0110 2,41	10	101405 0110 1,46	10	101008 0110 2,95
1.20	16	38	0.04	10	101005 0120 2,43	10	101405 0120 1,51	10	101008 0120 3,03
1.30	16	38	0.04	10	101005 0130 2,31	10	101405 0130 1,46	10	101008 0130 2,95
1.40	18	40	0.04	10	101005 0140 2,23	10	101405 0140 1,46	10	101008 0140 2,78
1.50	18	40	0.04	10	101005 0150 2,01	10	101405 0150 1,35	10	101008 0150 2,21
1.60	20	43	0.04	10	101005 0160 1,95	10	101405 0160 1,35	10	101008 0160 2,46
1.70	20	43	0.04	10	101005 0170 2,01	10	101405 0170 1,38	10	101008 0170 2,46
1.80	22	46	0.04	10	101005 0180 1,77	10	101405 0180 1,15	10	101008 0180 2,30
1.90	22	46	0.04	10	101005 0190 1,78	10	101405 0190 1,15	10	101008 0190 2,30
2.00	24	49	0.04	10	101005 0200 1,40	10	101405 0200 1,01	10	101008 0200 1,75
2.10	24	49	0.04	10	101005 0210 1,77	10	101405 0210 1,15	10	101008 0210 2,23
2.20	27	53	0.04	10	101005 0220 1,81	10	101405 0220 1,21	10	101008 0220 2,30
2.30	27	53	0.04	10	101005 0230 1,81	10	101405 0230 1,21	10	101008 0230 2,37
2.40	30	57	0.04	10	101005 0240 1,89	10	101405 0240 1,28	10	101008 0240 2,30
2.50	30	57	0.09	10	101005 0250 1,83	10	101405 0250 1,28	10	101008 0250 2,10
2.60	30	57	0.09	10	101005 0260 1,95	10	101405 0260 1,34	10	101008 0260 2,46
2.70	33	61	0.09	10	101005 0270 1,95	10	101405 0270 1,34	10	101008 0270 2,46
2.80	33	61	0.09	10	101005 0280 2,01	10	101405 0280 1,34	10	101008 0280 2,46
2.90	33	61	0.09	10	101005 0290 2,01	10	101405 0290 1,34	10	101008 0290 2,46
3.00	33	61	0.09	10	101005 0300 1,58	10	101405 0300 0,75	10	101008 0300 1,81
3.10	36	65	0.09	10	101005 0310 2,08	10	101405 0310 1,46	10	101008 0310 2,64
3.20	36	65	0.09	10	101005 0320 2,05	10	101405 0320 1,46	10	101008 0320 2,20
3.30	36	65	0.09	10	101005 0330 2,10	10	101405 0330 1,40	10	101008 0330 2,20
3.40	39	70	0.09	10	101005 0340 2,08	10	101405 0340 1,45	10	101008 0340 2,64
3.50	39	70	0.09	10	101005 0350 1,83	10	101405 0350 1,28	10	101008 0350 2,03
3.60	39	70	0.09	10	101005 0360 2,26	10	101405 0360 1,51	10	101008 0360 2,85
3.70	39	70	0.09	10	101005 0370 2,41	10	101405 0370 1,61	10	101008 0370 2,95
3.80	43	75	0.09	10	101005 0380 2,32	10	101405 0380 1,56	10	101008 0380 3,03
3.90	43	75	0.09	10	101005 0390 2,52	10	101405 0390 1,68	10	101008 0390 3,17
4.00	43	75	0.09	10	101005 0400 1,79	10	101405 0400 1,40	10	101008 0400 2,03
4.10	43	75	0.09	10	101005 0410 2,70	10	101405 0410 1,81	10	101008 0410 3,41
4.20	43	75	0.09	10	101005 0420 2,32	10	101405 0420 1,61	10	101008 0420 2,64
4.30	47	80	0.09	10	101005 0430 2,76	10	101405 0430 1,66	10	101008 0430 3,41
4.40	47	80	0.09	10	101005 0440 2,76	10	101405 0440 1,66	10	101008 0440 3,41
4.50	47	80	0.09	10	101005 0450 2,44	10	101405 0450 1,66	10	101008 0450 2,80
4.60	47	80	0.09	10	101005 0460 2,76	10	101405 0460 1,73	10	101008 0460 3,56
4.70	47	80	0.09	10	101005 0470 2,83	10	101405 0470 1,73	10	101008 0470 3,66
4.80	52	86	0.09	10	101005 0480 2,85	10	101405 0480 1,73	10	101008 0480 3,26
4.90	52	86	0.09	10	101005 0490 2,95	10	101405 0490 1,73	10	101008 0490 3,82
5.00	52	86	0.09	10	101005 0500 2,28	10	101405 0500 1,59	10	101008 0500 2,68
5.10	52	86	0.13	10	101005 0510 3,05	10	101405 0510 1,61	10	101008 0510 3,82
5.20	52	86	0.13	10	101005 0520 3,05	10	101405 0520 1,66	10	101008 0520 3,89
5.30	52	86	0.13	10	101005 0530 3,05	10	101405 0530 1,73	10	101008 0530 3,89
5.40	57	93	0.13	10	101005 0540 3,54	10	101405 0540 1,81	10	101008 0540 4,60
5.50	57	93	0.13	10	101005 0550 3,32	10	101405 0550 1,86	10	101008 0550 3,62
5.60	57	93	0.13	10	101005 0560 3,56	10	101405 0560 2,20	10	101008 0560 4,69
5.70	57	93	0.13	10	101005 0570 3,65	10	101405 0570 2,25	10	101008 0570 4,69
5.80	57	93	0.13	10	101005 0580 3,77	10	101405 0580 2,25	10	101008 0580 4,27
5.90	57	93	0.13	10	101005 0590 3,79	10	101405 0590 2,36	10	101008 0590 4,92
6.00	57	93	0.13	1	101005 0600 3,11	1	101405 0600 2,27	1	101008 0600 3,61
6.10	63	101	0.13	1	101005 0610 4,11	1	101405 0610 2,82	1	101008 0610 5,30
6.20	63	101	0.13	1	101005 0620 4,11	1	101405 0620 2,82	1	101008 0620 5,30
6.30	63	101	0.13	1	101005 0630 4,18	1	101405 0630 2,66	1	101008 0630 5,40
6.40	63	101	0.13	1	101005 0640 4,41	1	101405 0640 2,66	1	101008 0640 5,70
6.50	63	101	0.13	1	101005 0650 4,09	1	101405 0650 2,43	1	101008 0650 4,31
6.60	63	101	0.13	1	101005 0660 4,58	1	101405 0660 2,95	1	101008 0660 5,70
6.70	63	101	0.13	1	101005 0670 4,75	1	101405 0670 3,01	1	101008 0670 5,90
6.80	69	109	0.13	1	101005 0680 5,55	1	101405 0680 3,46	1	101008 0680 6,50
6.90	69	109	0.13	1	101005 0690 5,55	1	101405 0690 3,52	1	101008 0690 7,05
					1104		1137		1104

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	ATORN®		SARA®		ATORN®	
				Vapour-treated art.no.	€	Vapour-treated art.no.	€	TiN art.no.	€
7.00	69	109	0.13	101005 0700	4,73	101405 0700	3,31	101008 0700	5,30
7.10	69	109	0.13	101005 0710	5,75	101405 0710	3,87	101008 0710	7,40
7.20	69	109	0.13	101005 0720	5,90	101405 0720	3,99	101008 0720	7,60
7.30	69	109	0.13	101005 0730	5,90	101405 0730	3,99	101008 0730	7,65
7.40	69	109	0.13	101005 0740	6,20	101405 0740	4,10	101008 0740	8,15
7.50	69	109	0.13	101005 0750	5,55	101405 0750	3,41	101008 0750	5,85
7.60	75	117	0.13	101005 0760	6,60	101405 0760	4,39	101008 0760	8,40
7.70	75	117	0.13	101005 0770	6,60	101405 0770	4,39	101008 0770	8,40
7.80	75	117	0.13	101005 0780	6,60	101405 0780	4,45	101008 0780	8,15
7.90	75	117	0.13	101005 0790	6,75	101405 0790	4,51	101008 0790	8,55
8.00	75	117	0.13	101005 0800	5,15	101405 0800	3,64	101008 0800	5,55
8.10	75	117	0.18	101005 0810	7,-	101405 0810	4,67	101008 0810	8,70
8.20	75	117	0.18	101005 0820	7,15	101405 0820	4,92	101008 0820	8,90
8.30	75	117	0.18	101005 0830	7,85	101405 0830	5,25	101008 0830	9,60
8.40	75	117	0.18	101005 0840	7,85	101405 0840	5,25	101008 0840	9,60
8.50	75	117	0.18	101005 0850	7,35	101405 0850	4,10	101008 0850	7,60
8.60	81	125	0.18	101005 0860	8,65	101405 0860	5,90	101008 0860	9,40
8.70	81	125	0.18	101005 0870	8,65	101405 0870	5,90	101008 0870	9,40
8.80	81	125	0.18	101005 0880	9,05	101405 0880	6,10	101008 0880	10,80
8.90	81	125	0.18	101005 0890	9,40	101405 0890	6,55	101008 0890	10,05
9.00	81	125	0.18	101005 0900	7,75	101405 0900	4,56	101008 0900	8,20
9.10	81	125	0.18	101005 0910	9,40	101405 0910	6,45	101008 0910	11,30
9.20	81	125	0.18	101005 0920	9,40	101405 0920	6,45	101008 0920	10,20
9.30	81	125	0.18	101005 0930	9,45	101405 0930	6,50	101008 0930	11,55
9.40	81	125	0.18	101005 0940	9,45	101405 0940	6,50	101008 0940	10,45
9.50	81	125	0.18	101005 0950	9,45	101405 0950	5,25	101008 0950	9,45
9.60	87	133	0.18	101005 0960	10,40	101405 0960	7,20	101008 0960	11,30
9.70	87	133	0.18	101005 0970	10,40	101405 0970	7,20	101008 0970	11,55
9.80	87	133	0.18	101005 0980	11,45	101405 0980	7,90	101008 0980	13,95
9.90	87	133	0.18	101005 0990	11,45	101405 0990	8,-	101008 0990	12,25
10.00	87	133	0.18	101005 1000	9,35	101405 1000	5,70	101008 1000	10,-
10.10	87	133	0.18	101005 1010	12,25	101405 1010	8,30	101008 1010	13,10
10.20	87	133	0.18	101005 1020	12,40	101405 1020	8,25	101008 1020	11,80
10.30	87	133	0.18	101005 1030	15,15	101405 1030	8,60	101008 1030	16,05
10.40	87	133	0.18	101005 1040	15,15	101405 1040	8,60	101008 1040	16,05
10.50	87	133	0.18	101005 1050	12,80	101405 1050	7,30	101008 1050	12,75
10.60	87	133	0.18	101005 1060	16,05	101405 1060	8,30	101008 1060	16,75
10.70	94	142	0.18	101005 1070	18,25	101405 1070	11,50	101008 1070	21,50
10.80	94	142	0.18	101005 1080	17,80	101405 1080	11,45	101008 1080	19,35
10.90	94	142	0.18	101005 1090	18,85	101405 1090	9,35	101008 1090	20,90
11.00	94	142	0.18	101005 1100	14,60	101405 1100	8,65	101008 1100	14,70
11.10	94	142	0.18	101005 1110	18,85	101405 1110	9,45	101008 1110	20,10
11.20	94	142	0.18	101005 1120	18,25	101405 1120	9,45	101008 1120	19,65
11.30	94	142	0.18	101005 1130	19,30	101405 1130	9,70	101008 1130	21,20
11.40	94	142	0.18	101005 1140	19,30	101405 1140	9,90	101008 1140	21,20
11.50	94	142	0.18	101005 1150	16,05	101405 1150	9,20	101008 1150	19,65
11.60	94	142	0.18	101005 1160	19,30	101405 1160	10,-	101008 1160	21,20
11.70	94	142	0.18	101005 1170	20,10	101405 1170	10,35	101008 1170	21,50
11.80	94	142	0.18	101005 1180	20,40	101405 1180	10,10	101008 1180	21,50
11.90	101	151	0.18	101005 1190	22,40	101405 1190	10,45	101008 1190	26,40
12.00	101	151	0.18	101005 1200	17,80	101405 1200	10,30	101008 1200	18,35
12.10	101	151	0.22	101005 1210	23,70	101405 1210	11,25	101008 1210	25,80
12.20	101	151	0.22	101005 1220	23,70	101405 1220	11,05	101008 1220	25,80
12.30	101	151	0.22	101005 1230	23,80	101405 1230	11,15	101008 1230	23,70
12.40	101	151	0.22	101005 1240	24,90	101405 1240	13,-	101008 1240	27,90
12.50	101	151	0.22	101005 1250	19,85	101405 1250	12,15	101008 1250	21,60
12.60	101	151	0.22	101005 1260	24,90	101405 1260	13,55	101008 1260	30,20
12.70	101	151	0.22	101005 1270	26,80	101405 1270	13,-	101008 1270	27,60
12.80	101	151	0.22	101005 1280	26,90	101405 1280	13,45	101008 1280	28,50

1104

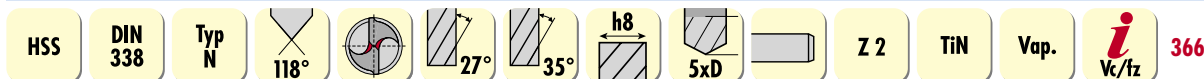
1137

1104

Continued on next page &gt;&gt;&gt;

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	ATORN®		SARA®		ATORN®	
				☒	Vapour-treated art.no. €	☒	Vapour-treated art.no. €	☒	TiN art.no. €
12.90	101	151	0.22	1	101005 1290 27,-	1	101405 1290 13,75	1	101008 1290 34,10
13.00	101	151	0.22	1	101005 1300 21,60	1	101405 1300 12,90	1	101008 1300 24,50
13.25	108	160	0.22	1	101005 1325 26,10			1	101008 1325 40,50
13.50	108	160	0.22	1	101005 1350 25,30	1	101405 1350 12,95	1	101008 1350 31,90
13.75	108	160	0.22	1	101005 1375 27,-			1	101008 1375 46,-
14.00	108	160	0.22	1	101005 1400 28,40	1	101405 1400 13,30	1	101008 1400 31,50
14.25	114	169	0.22	1	101005 1425 32,40			1	101008 1425 50,90
14.50	114	169	0.22	1	101005 1450 30,20	1	101405 1450 15,25	1	101008 1450 31,70
14.75	114	169	0.22	1	101005 1475 46,70			1	101008 1475 51,40
15.00	114	169	0.22	1	101005 1500 32,40	1	101405 1500 15,25	1	101008 1500 36,60
15.25	120	178	0.22	1	101005 1525 60,30			1	101008 1525 66,90
15.50	120	178	0.22	1	101005 1550 35,60	1	101405 1550 18,05	1	101008 1550 38,20
15.75	120	178	0.22	1	101005 1575 63,90			1	101008 1575 71,40
16.00	120	178	0.22	1	101005 1600 38,30	1	101405 1600 22,20	1	101008 1600 41,30
16.50	125	187	0.28	1	101005 1650 46,40				
17.00	125	187	0.28	1	101005 1700 50,20				
17.50	130	196	0.28	1	101005 1750 56,80				
18.00	130	196	0.28	1	101005 1800 52,20				
18.50	135	205	0.28	1	101005 1850 60,90				
19.00	135	205	0.28	1	101005 1900 64,90				
19.50	140	214	0.28	1	101005 1950 68,10				
20.00	140	214	0.28	1	101005 2000 62,90				
					1104		1137		1104

### ATORN® Twist drill bit sets



- 101035.... profile-ground, vapour-treated from Ø 2.4 mm, point thinning from Ø ≥ 1 mm
- 101048.... TiN head coating, bare chip flute, point thinning from Ø ≥ 1 mm

material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel	
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
101035....	●	○		○			●	○					○	○	○	○		
101048....	●	○		○			○	○					○	○	○	○		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Number of drills	Vapour-treated art.no. €	TiN art.no. €
Ø 1.0 to 5.9 mm in 0.1 mm increments	50	101035 0001 138,-	101048 0001 145,-
Ø 6.0 to 10.0 mm in 0.1 mm increments	41	101035 0002 283,-	101048 0002 314,-
Ø 1.0 to 10.0 mm in 0.5 mm increments	19	101035 0003 84,30	101048 0003 89,50
Ø 1.0 to 13.0 mm in 0.5 mm increments	25	101035 0004 177,-	101048 0004 204,-
Ø 1.0 to 10.5 mm in 0.5 mm increments with the following additional dimensions for threaded bores: Ø 3.3-4.2-6.8-10.2 mm	24	101035 0005 116,50	101048 0005 127,50
		1104	1104

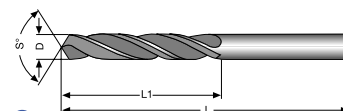
# ATORN® Twist drill bit

HSS
DIN 338
Typ TLP
130°
38°
h8
5xD
Z 2
i Vc/tz
367

- Self-centring
- Optimised chip flute profile for excellent chip removal
- Nitrided chamfers from Ø 2.4 mm

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		30	20		10			25	20			60	40	45					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	☒	art.no.	€
1.00	34	12	0.03	10	101011 0100	2,42
1.10	36	14	0.04	10	101011 0110	2,35
1.20	38	16	0.04	10	101011 0120	2,42
1.30	38	16	0.04	10	101011 0130	2,42
1.40	40	18	0.04	10	101011 0140	2,42
1.50	40	18	0.04	10	101011 0150	2,44
1.60	43	20	0.04	10	101011 0160	2,44
1.70	43	20	0.04	10	101011 0170	2,44
1.80	46	22	0.04	10	101011 0180	2,44
1.90	46	22	0.04	10	101011 0190	2,44
2.00	49	24	0.04	10	101011 0200	2,62
2.10	49	24	0.04	10	101011 0210	2,62
2.20	53	27	0.04	10	101011 0220	2,62
2.30	53	27	0.04	10	101011 0230	2,62
2.40	57	30	0.04	10	101011 0240	2,62
2.50	57	30	0.04	10	101011 0250	2,69
2.60	57	30	0.09	10	101011 0260	2,69
2.70	61	33	0.09	10	101011 0270	2,77
2.80	61	33	0.09	10	101011 0280	2,77
2.90	61	33	0.09	10	101011 0290	2,77
3.00	61	33	0.09	10	101011 0300	2,69
3.10	65	36	0.09	10	101011 0310	2,77
3.20	65	36	0.09	10	101011 0320	2,77
3.30	65	36	0.09	10	101011 0330	2,82
3.40	70	39	0.09	10	101011 0340	3,14
3.50	70	39	0.09	10	101011 0350	3,07
3.60	70	39	0.09	10	101011 0360	3,07
3.70	70	39	0.09	10	101011 0370	3,14
3.80	75	43	0.09	10	101011 0380	3,39
3.90	75	43	0.09	10	101011 0390	3,39
4.00	75	43	0.09	10	101011 0400	3,26
4.10	75	43	0.09	10	101011 0410	3,39
4.20	75	43	0.09	10	101011 0420	3,39
4.30	80	47	0.09	10	101011 0430	3,47
4.40	80	47	0.09	10	101011 0440	3,47
4.50	80	47	0.09	10	101011 0450	3,35
4.60	80	47	0.09	10	101011 0460	3,47
4.70	80	47	0.09	10	101011 0470	3,47
4.80	86	52	0.09	10	101011 0480	3,47
4.90	86	52	0.09	10	101011 0490	3,52
5.00	86	52	0.09	10	101011 0500	3,52
5.10	86	52	0.13	10	101011 0510	3,72
5.20	86	52	0.13	10	101011 0520	3,72
5.30	86	52	0.13	10	101011 0530	3,72
5.40	93	57	0.13	10	101011 0540	4,07
5.50	93	57	0.13	10	101011 0550	3,87
5.60	93	57	0.13	10	101011 0560	4,37
5.70	93	57	0.13	10	101011 0570	4,37

1104

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	☒	art.no.	€
5.80	93	57	0.13	10	101011 0580	4,37
5.90	93	57	0.13	10	101011 0590	4,37
6.00	93	57	0.13	10	101011 0600	4,25
6.10	101	63	0.13	1	101011 0610	4,85
6.20	101	63	0.13	1	101011 0620	4,85
6.30	101	63	0.13	1	101011 0630	4,85
6.40	101	63	0.13	1	101011 0640	4,74
6.50	101	63	0.13	1	101011 0650	4,85
6.60	101	63	0.13	1	101011 0660	5,40
6.70	101	63	0.13	1	101011 0670	5,40
6.80	109	69	0.13	1	101011 0680	6,35
6.90	109	69	0.13	1	101011 0690	6,35
7.00	109	69	0.13	1	101011 0700	6,25
7.10	109	69	0.13	1	101011 0710	7,75
7.20	109	69	0.13	1	101011 0720	7,75
7.30	109	69	0.13	1	101011 0730	7,75
7.40	109	69	0.13	1	101011 0740	7,75
7.50	109	69	0.13	1	101011 0750	6,50
7.60	117	75	0.13	1	101011 0760	8,40
7.70	117	75	0.13	1	101011 0770	8,40
7.80	117	75	0.13	1	101011 0780	8,40
7.90	117	75	0.13	1	101011 0790	8,40
8.00	117	75	0.13	1	101011 0800	6,85
8.10	117	75	0.18	1	101011 0810	8,40
8.20	117	75	0.18	1	101011 0820	8,40
8.30	117	75	0.18	1	101011 0830	8,40
8.40	117	75	0.18	1	101011 0840	8,15
8.50	117	75	0.18	1	101011 0850	7,40
8.60	125	81	0.18	1	101011 0860	9,90
8.70	125	81	0.18	1	101011 0870	9,90
8.80	125	81	0.18	1	101011 0880	9,90
8.90	125	81	0.18	1	101011 0890	9,90
9.00	125	81	0.18	1	101011 0900	8,45
9.10	125	81	0.18	1	101011 0910	10,35
9.20	125	81	0.18	1	101011 0920	10,35
9.30	125	81	0.18	1	101011 0930	10,75
9.40	125	81	0.18	1	101011 0940	10,75
9.50	125	81	0.18	1	101011 0950	9,50
9.60	133	87	0.18	1	101011 0960	11,80
9.70	133	87	0.18	1	101011 0970	11,80
9.80	133	87	0.18	1	101011 0980	11,80
9.90	133	87	0.18	1	101011 0990	11,80
10.00	133	87	0.18	1	101011 1000	10,65
10.20	133	87	0.18	1	101011 1020	13,85
10.50	133	87	0.18	1	101011 1050	13,85
11.00	142	94	0.18	1	101011 1100	15,95
11.50	142	94	0.18	1	101011 1150	18,15
12.00	151	101	0.18	1	101011 1200	18,95

1104



# ATORN® Twist drill bit

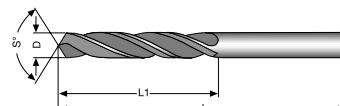
HSS
DIN 338
Typ W
130°
37°
h8
5xD
Z 2
Vc/tz 368

**Aluminium**

- Self-centring
- Specially designed for machining aluminium/aluminium alloys

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	G6/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
												75	65	45					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	L mm	L1 mm	Feed f aluminium < 8 % Si mm/rev	☒	art.no.	€
1.0	34	12	0.05	10	101017 0100	2,90
1.2	38	16	0.05	10	101017 0120	2,88
1.5	40	18	0.05	10	101017 0150	2,88
1.6	43	20	0.05	10	101017 0160	2,61
1.7	43	20	0.05	10	101017 0170	2,72
1.8	46	22	0.05	10	101017 0180	2,70
1.9	46	22	0.05	10	101017 0190	2,70
2.0	49	24	0.05	10	101017 0200	2,02
2.1	49	24	0.05	10	101017 0210	2,49
2.2	53	27	0.05	10	101017 0220	2,49
2.3	53	27	0.05	10	101017 0230	2,49
2.4	57	30	0.05	10	101017 0240	2,61
2.5	57	30	0.05	10	101017 0250	2,18
2.6	57	30	0.05	10	101017 0260	2,70
2.7	61	33	0.05	10	101017 0270	2,76
2.8	61	33	0.05	10	101017 0280	2,99
3.0	61	33	0.09	10	101017 0300	2,27
3.1	65	36	0.09	10	101017 0310	2,99
3.2	65	36	0.09	10	101017 0320	2,72
3.3	65	36	0.09	10	101017 0330	2,76
3.4	70	39	0.09	10	101017 0340	3,02
3.5	70	39	0.09	10	101017 0350	2,79
3.6	70	39	0.09	10	101017 0360	3,02
3.7	70	39	0.09	10	101017 0370	3,09
3.8	75	43	0.09	10	101017 0380	3,32
3.9	75	43	0.09	10	101017 0390	3,32
4.0	75	43	0.09	10	101017 0400	2,76
4.1	75	43	0.09	10	101017 0410	3,32
4.2	75	43	0.09	10	101017 0420	2,99
4.3	80	47	0.09	10	101017 0430	4,06
4.5	80	47	0.09	10	101017 0450	3,63
4.8	86	52	0.09	10	101017 0480	4,06
4.9	86	52	0.09	10	101017 0490	4,06

D h8 mm	L mm	L1 mm	Feed f aluminium < 8 % Si mm/rev	☒	art.no.	€
5.0	86	52	0.09	10	101017 0500	3,71
5.2	86	52	0.13	10	101017 0520	4,48
5.3	86	52	0.13	10	101017 0530	4,48
5.5	93	57	0.13	10	101017 0550	4,42
5.6	93	57	0.13	10	101017 0560	5,30
5.7	93	57	0.13	10	101017 0570	5,30
5.8	93	57	0.13	10	101017 0580	5,30
5.9	93	57	0.13	10	101017 0590	5,30
6.0	93	57	0.13	1	101017 0600	4,28
6.1	101	63	0.13	1	101017 0610	5,30
6.2	101	63	0.13	1	101017 0620	5,30
6.3	101	63	0.13	1	101017 0630	5,75
6.5	101	63	0.13	1	101017 0650	5,40
6.6	101	63	0.13	1	101017 0660	6,65
6.8	109	69	0.13	1	101017 0680	7,10
7.0	109	69	0.13	1	101017 0700	6,80
7.5	109	69	0.13	1	101017 0750	7,50
8.0	117	75	0.13	1	101017 0800	10,90
8.1	117	75	0.13	1	101017 0810	11,65
8.2	117	75	0.18	1	101017 0820	12,10
8.4	117	75	0.18	1	101017 0840	12,90
8.5	117	75	0.18	1	101017 0850	9,55
9.0	125	81	0.18	1	101017 0900	9,75
9.5	125	81	0.18	1	101017 0950	12,05
10.0	133	87	0.18	1	101017 1000	12,05
10.5	133	87	0.18	1	101017 1050	15,50
11.0	142	94	0.18	1	101017 1100	18,35
12.0	151	101	0.18	1	101017 1200	22,30
12.5	151	101	0.22	1	101017 1250	22,30
13.0	151	101	0.22	1	101017 1300	26,40
13.5	160	108	0.22	1	101017 1350	32,80
14.0	160	108	0.22	1	101017 1400	30,60

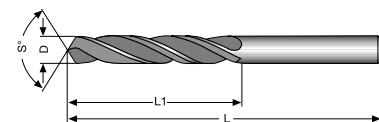
1104

1104

# ATORN® Twist drill bit

HSS-E
DIN 338
Typ N
Typ VA
118°
130°
27°
40°
h8
5xD
Z 2
Vap.
i Vc/fz
366

- 101006.... profile-ground, vapour-treated from Ø 2.4 mm, point thinning from ≥ Ø 1 mm
- 101010.... profile-ground, point thinning from Ø ≥ 1 mm, self-centring



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
101006....	●	●	●		●	●		●	○			○	○	○					
101010....	○	○	○	○	●	●				●	●	●	○	○	○				

30 20 10 12 10 25 20 55 45 70 50 70

30 20 10 10 20 10 10 10 70 50 70

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	Type N, 118°, vap. art.no.	€	Type VA, 130°, blank art.no.	€
1.00	12	34	0.03	10 101006 0100	2,32	10 101010 0100	2,45
1.10	14	36	0.04	10 101006 0110	2,32	10 101010 0110	2,45
1.20	16	38	0.04	10 101006 0120	2,32	10 101010 0120	2,45
1.30	16	38	0.04	10 101006 0130	2,32	10 101010 0130	2,45
1.40	18	40	0.04	10 101006 0140	2,32	10 101010 0140	2,45
1.50	18	40	0.04	10 101006 0150	2,34	10 101010 0150	2,47
1.60	20	43	0.04	10 101006 0160	2,34	10 101010 0160	2,47
1.70	20	43	0.04	10 101006 0170	2,27	10 101010 0170	2,39
1.80	22	46	0.04	10 101006 0180	2,34	10 101010 0180	2,47
1.90	22	46	0.04	10 101006 0190	2,34	10 101010 0190	2,47
2.00	24	49	0.04	10 101006 0200	2,48	10 101010 0200	2,62
2.10	24	49	0.04	10 101006 0210	2,48	10 101010 0210	2,62
2.20	27	53	0.04	10 101006 0220	2,48	10 101010 0220	2,62
2.30	27	53	0.04	10 101006 0230	2,48	10 101010 0230	2,62
2.40	30	57	0.04	10 101006 0240	2,48	10 101010 0240	2,62
2.50	30	57	0.09	10 101006 0250	2,58	10 101010 0250	2,71
2.60	30	57	0.09	10 101006 0260	2,58	10 101010 0260	2,71
2.70	33	61	0.09	10 101006 0270	2,65	10 101010 0270	2,79
2.80	33	61	0.09	10 101006 0280	2,65	10 101010 0280	2,79
2.90	33	61	0.09	10 101006 0290	2,65	10 101010 0290	2,79
3.00	33	61	0.09	10 101006 0300	2,58	10 101010 0300	2,71
3.10	36	65	0.09	10 101006 0310	2,65	10 101010 0310	2,79
3.20	36	65	0.09	10 101006 0320	2,65	10 101010 0320	2,79
3.30	36	65	0.09	10 101006 0330	2,69	10 101010 0330	2,83
3.40	39	70	0.09	10 101006 0340	2,96	10 101010 0340	3,12
3.50	39	70	0.09	10 101006 0350	2,91	10 101010 0350	3,07
3.60	39	70	0.09	10 101006 0360	2,96	10 101010 0360	3,12
3.70	39	70	0.09	10 101006 0370	2,96	10 101010 0370	3,12
3.80	43	75	0.09	10 101006 0380	3,27	10 101010 0380	3,44
3.90	43	75	0.09	10 101006 0390	3,27	10 101010 0390	3,44
4.00	43	75	0.09	10 101006 0400	3,07	10 101010 0400	3,23
4.10	43	75	0.09	10 101006 0410	3,27	10 101010 0410	3,44
4.20	43	75	0.09	10 101006 0420	3,27	10 101010 0420	3,44
4.30	47	80	0.09	10 101006 0430	3,34	10 101010 0430	3,51
4.40	47	80	0.09	10 101006 0440	3,34	10 101010 0440	3,51
4.50	47	80	0.09	10 101006 0450	3,32	10 101010 0450	3,49
4.60	47	80	0.09	10 101006 0460	3,34	10 101010 0460	3,51
4.70	47	80	0.09	10 101006 0470	3,34	10 101010 0470	3,51
4.80	52	86	0.09	10 101006 0480	3,34	10 101010 0480	3,51
4.90	52	86	0.09	10 101006 0490	3,37	10 101010 0490	3,54
5.00	52	86	0.09	10 101006 0500	3,37	10 101010 0500	3,54
5.10	52	86	0.13	10 101006 0510	3,50	10 101010 0510	3,70
5.20	52	86	0.13	10 101006 0520	3,50	10 101010 0520	3,70
5.30	52	86	0.13	10 101006 0530	3,50	10 101010 0530	3,70



D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	Type N, 118°, vap.		Type VA, 130°, blank			
				art.no.	€	art.no.	€		
5.40	57	93	0.13	10	101006 0540	3,87	10	101010 0540	4,07
5.50	57	93	0.13	10	101006 0550	3,73	10	101010 0550	3,92
5.60	57	93	0.13	10	101006 0560	4,16	10	101010 0560	4,38
5.70	57	93	0.13	10	101006 0570	4,16	10	101010 0570	4,38
5.80	57	93	0.13	10	101006 0580	4,16	10	101010 0580	4,38
5.90	57	93	0.13	10	101006 0590	4,16	10	101010 0590	4,38
6.00	57	93	0.13	1	101006 0600	4,05	10	101010 0600	4,27
6.10	63	101	0.13	1	101006 0610	4,64	1	101010 0610	4,89
6.20	63	101	0.13	1	101006 0620	4,64	1	101010 0620	4,89
6.30	63	101	0.13	1	101006 0630	4,64	1	101010 0630	4,89
6.40	63	101	0.13	1	101006 0640	4,64	1	101010 0640	4,89
6.50	63	101	0.13	1	101006 0650	4,57	1	101010 0650	4,83
6.60	63	101	0.13	1	101006 0660	4,99	1	101010 0660	5,25
6.70	63	101	0.13	1	101006 0670	4,99	1	101010 0670	5,25
6.80	69	109	0.13	1	101006 0680	6,10	1	101010 0680	6,40
6.90	69	109	0.13	1	101006 0690	6,10	1	101010 0690	6,40
7.00	69	109	0.13	1	101006 0700	6,05	1	101010 0700	6,35
7.10	69	109	0.13	1	101006 0710	7,40	1	101010 0710	7,80
7.20	69	109	0.13	1	101006 0720	7,40	1	101010 0720	7,80
7.30	69	109	0.13	1	101006 0730	7,40	1	101010 0730	7,80
7.40	69	109	0.13	1	101006 0740	7,40	1	101010 0740	7,80
7.50	69	109	0.13	1	101006 0750	6,30	1	101010 0750	6,60
7.60	75	117	0.13	1	101006 0760	8,20	1	101010 0760	8,60
7.70	75	117	0.13	1	101006 0770	8,20	1	101010 0770	8,60
7.80	75	117	0.13	1	101006 0780	8,20	1	101010 0780	8,60
7.90	75	117	0.13	1	101006 0790	8,20	1	101010 0790	8,60
8.00	75	117	0.13	1	101006 0800	6,65	1	101010 0800	7,-
8.10	75	117	0.18	1	101006 0810	8,20	1	101010 0810	8,60
8.20	75	117	0.18	1	101006 0820	8,20	1	101010 0820	8,60
8.30	75	117	0.18	1	101006 0830	8,20	1	101010 0830	8,60
8.40	75	117	0.18	1	101006 0840	8,20	1	101010 0840	8,60
8.50	75	117	0.18	1	101006 0850	7,15	1	101010 0850	7,60
8.60	81	125	0.18	1	101006 0860	9,50	1	101010 0860	10,-
8.70	81	125	0.18	1	101006 0870	9,50	1	101010 0870	10,-
8.80	81	125	0.18	1	101006 0880	9,50	1	101010 0880	10,-
8.90	81	125	0.18	1	101006 0890	9,50	1	101010 0890	10,-
9.00	81	125	0.18	1	101006 0900	8,20	1	101010 0900	8,65
9.10	81	125	0.18	1	101006 0910	10,05	1	101010 0910	10,55
9.20	81	125	0.18	1	101006 0920	10,05	1	101010 0920	10,55
9.30	81	125	0.18	1	101006 0930	10,30	1	101010 0930	10,85
9.40	81	125	0.18	1	101006 0940	10,30	1	101010 0940	10,85
9.50	81	125	0.18	1	101006 0950	9,10	1	101010 0950	9,55
9.60	87	133	0.18	1	101006 0960	11,40	1	101010 0960	12,05
9.70	87	133	0.18	1	101006 0970	11,40	1	101010 0970	12,05
9.80	87	133	0.18	1	101006 0980	11,40	1	101010 0980	12,05
9.90	87	133	0.18	1	101006 0990	11,40	1	101010 0990	12,05
10.00	87	133	0.18	1	101006 1000	10,25	1	101010 1000	10,75
10.10	87	133	0.18	1	101006 1010	13,90			
10.20	87	133	0.18	1	101006 1020	13,15	1	101010 1020	13,85
10.30	87	133	0.18	1	101006 1030	21,20			
10.40	87	133	0.18	1	101006 1040	21,50			
10.50	87	133	0.18	1	101006 1050	13,15	1	101010 1050	13,85
10.60	87	133	0.18	1	101006 1060	27,70			
10.70	94	142	0.18	1	101006 1070	28,-			
10.80	94	142	0.18	1	101006 1080	26,20			
10.90	94	142	0.18	1	101006 1090	29,30			
11.00	94	142	0.18	1	101006 1100	15,60	1	101010 1100	16,40
11.10	94	142	0.18	1	101006 1110	30,90			
11.20	94	142	0.18	1	101006 1120	30,50			

1104

1104

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	Type N, 118°, vap.		Type VA, 130°, blank	
				art.no.	€	art.no.	€
11.30	94	142	0.18	1 101006 1130	33,80		
11.40	94	142	0.18	1 101006 1140	29,50		
11.50	94	142	0.18	1 101006 1150	16,95	1 101010 1150	17,90
11.60	94	142	0.18	1 101006 1160	34,90		
11.70	94	142	0.18	1 101006 1170	34,90		
11.80	94	142	0.18	1 101006 1180	24,70	1 101010 1180	26,10
11.90	101	151	0.18	1 101006 1190	34,90		
12.00	101	151	0.18	1 101006 1200	18,25	1 101010 1200	19,15
12.10	101	151	0.22	1 101006 1210	34,90		
12.20	101	151	0.22	1 101006 1220	34,90	1 101010 1220	15,30
12.30	101	151	0.22	1 101006 1230	26,10		
12.40	101	151	0.22	1 101006 1240	36,60		
12.50	101	151	0.22	1 101006 1250	21,60	1 101010 1250	22,70
12.60	101	151	0.22	1 101006 1260	41,80		
12.70	101	151	0.22	1 101006 1270	26,-		
12.80	101	151	0.22	1 101006 1280	47,80		
12.90	101	151	0.22	1 101006 1290	41,80		
13.00	101	151	0.22	1 101006 1300	25,70	1 101010 1300	27,-
13.50	108	160	0.22	1 101006 1350	31,30	1 101010 1350	32,90
13.75	108	160	0.22	1 101006 1375	65,70		
14.00	108	160	0.22	1 101006 1400	32,10	1 101010 1400	33,80
14.50	114	169	0.22	1 101006 1450	39,40	1 101010 1450	41,40
15.00	114	169	0.22	1 101006 1500	48,90	1 101010 1500	51,40
15.25	120	178	0.22	1 101006 1525	79,70		
15.50	120	178	0.22	1 101006 1550	52,40	1 101010 1550	39,70
15.75	120	178	0.22	1 101006 1575	82,40		
16.00	120	178	0.22	1 101006 1600	45,-	1 101010 1600	47,30
16.50	125	187	0.28	1 101006 1650	88,40		
17.00	125	187	0.28	1 101006 1700	83,70		
17.50	130	196	0.28	1 101006 1750	121,50		
18.00	130	196	0.28	1 101006 1800	93,-		
18.50	135	205	0.28	1 101006 1850	85,30		
19.00	135	205	0.28	1 101006 1900	90,50		
19.50	140	214	0.28	1 101006 1950	91,-		
20.00	140	214	0.28	1 101006 2000	96,60		

1104

1104



Deep drilling ...

... with brainpower.

**ATORN**<sup>®</sup>  
Performance demands quality

**ATORN® Twist drill bit sets**

HSS-E
DIN 338
Typ N
Typ VA
118°
130°
h8
5xD
Z 2
i Vc/fz
366

- 101036.... profile-ground, vapour-treated from Ø 2.3 mm, point thinning from Ø ≥ 1 mm
- 101038.... profile-ground, point thinning from Ø ≥ 1 mm, drilling with no need for accurate centring
- 101039.... Plastic case



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
101036....	●	●	●		○	○		●	○				○	○	○					
		30	20		12	10		25	20				55	45	45					
101038....	○	○	○	○	●	●				●	●	●	○	○	●					
		30	20	10	10	20				10	10	10	70	50	70					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



101036 0004

101038 0004

101039 0004

D mm	Number of pieces	Type N, 118°, vap. art.no.	€	Type VA, 130°, blank art.no.	€	Empty case art.no.	€
Ø 1.0 to 5.9 mm in 0.1 mm increments	50	101036 0001	175,-	101038 0001	185,-	101039 0001	27,-
Ø 6.0 to 10.0 mm in 0.1 mm increments	41	101036 0002	360,-	101038 0002	380,-	101039 0002	35,60
Ø 1.0 to 10.0 mm in 0.5 mm increments	19	101036 0003	101,-	101038 0003	106,50	101039 0003	11,15
Ø 1.0 to 13.0 mm in 0.5 mm increments	25	101036 0004	213,-	101038 0004	224,-	101039 0004	23,20
Ø 1.0 to 10.5 mm in 0.5 mm increments with the following additional dimensions for threaded bores: Ø 3.3 - 4.2 - 6.8 - 10.2 mm	24	101036 0005	147,50	101038 0005	155,50	101039 0005	36,20

1104

1104

1104



... with brainpower.

Deep drilling ...

**ATORN®**  
Performance demands quality



# ATORN® Twist drill bit

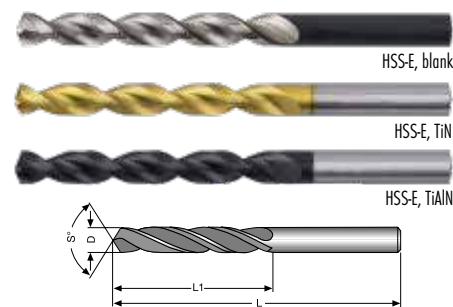
HSS-E
DIN 338
Typ TLP
130°
38°
h8
5xD
Z 2
TiN
TiAlN
Vc/tz

366, 367, 368

- **Self-centring**
- 101013.... profile-ground, nitrided from Ø 2.4 mm
- 101014.... profile-ground, TiN-coated
- 101012.... profile-ground, TiAlN-coated
- Optimised chip flute profile for excellent chip removal

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 8 % Si	≥ 8 % Si	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc
101013....	●	30	20	10	15	10		30	30	○	○	○	●	●	●	○			
101014....	●	35	30	15	15	10		30	25										
101012....	●	40	20	10	10	20		35	30	○	○	○	●	●	●	○			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€	TiN art.no.	€	TiAlN art.no.	€
1.00	34	12	0.04	10 101013 0100	2,84	10 101014 0100	3,76	10 101012 0100	4,69
1.10	36	14	0.04	10 101013 0110	2,77	10 101014 0110	4,60	10 101012 0110	5,75
1.20	38	16	0.04	10 101013 0120	2,84	10 101014 0120	4,28	10 101012 0120	5,35
1.30	38	16	0.04	10 101013 0130	2,84	10 101014 0130	4,77	10 101012 0130	5,95
1.40	40	18	0.04	10 101013 0140	2,84	10 101014 0140	4,90	10 101012 0140	6,15
1.50	40	18	0.04	10 101013 0150	2,87	10 101014 0150	4,28	10 101012 0150	5,35
1.60	43	20	0.04	10 101013 0160	2,87	10 101014 0160	4,02	10 101012 0160	5,05
1.70	43	20	0.04	10 101013 0170	2,87	10 101014 0170	5,10	10 101012 0170	6,35
1.80	46	22	0.04	10 101013 0180	2,87	10 101014 0180	4,73	10 101012 0180	5,90
1.90	46	22	0.04	10 101013 0190	2,87	10 101014 0190	4,56	10 101012 0190	5,70
2.00	49	24	0.04	10 101013 0200	3,08	10 101014 0200	4,56	10 101012 0200	5,70
2.10	49	24	0.04	10 101013 0210	3,08	10 101014 0210	5,25	10 101012 0210	6,55
2.20	53	27	0.04	10 101013 0220	3,08	10 101014 0220	5,30	10 101012 0220	6,65
2.30	53	27	0.04	10 101013 0230	3,08	10 101014 0230	5,10	10 101012 0230	6,35
2.40	57	30	0.04	10 101013 0240	3,08	10 101014 0240	5,45	10 101012 0240	6,80
2.50	57	30	0.09	10 101013 0250	3,16	10 101014 0250	4,60	10 101012 0250	5,75
2.60	57	30	0.09	10 101013 0260	3,16	10 101014 0260	5,45	10 101012 0260	6,80
2.70	61	33	0.09	10 101013 0270	3,25	10 101014 0270	5,70	10 101012 0270	7,15
2.80	61	33	0.09	10 101013 0280	3,25	10 101014 0280	5,70	10 101012 0280	7,15
2.90	61	33	0.09	10 101013 0290	3,25	10 101014 0290	5,75	10 101012 0290	7,20
3.00	61	33	0.09	10 101013 0300	3,16	10 101014 0300	5,25	10 101012 0300	6,55
3.10	65	36	0.09	10 101013 0310	3,25	10 101014 0310	6,25	10 101012 0310	7,80
3.20	65	36	0.09	10 101013 0320	3,25	10 101014 0320	5,70	10 101012 0320	7,15
3.30	65	36	0.09	10 101013 0330	3,31	10 101014 0330	6,30	10 101012 0330	7,85
3.40	70	39	0.09	10 101013 0340	3,68	10 101014 0340	6,60	10 101012 0340	8,25
3.50	70	39	0.09	10 101013 0350	3,58	10 101014 0350	6,90	10 101012 0350	8,65
3.60	70	39	0.09	10 101013 0360	3,58	10 101014 0360	6,90	10 101012 0360	8,65
3.70	70	39	0.09	10 101013 0370	3,68	10 101014 0370	7,-	10 101012 0370	8,75
3.80	75	43	0.09	10 101013 0380	4,01	10 101014 0380	7,10	10 101012 0380	8,90
3.90	75	43	0.09	10 101013 0390	4,01	10 101014 0390	7,25	10 101012 0390	9,10
4.00	75	43	0.09	10 101013 0400	3,85	10 101014 0400	7,05	10 101012 0400	8,80
4.10	75	43	0.09	10 101013 0410	4,01	10 101014 0410	7,-	10 101012 0410	8,75
4.20	75	43	0.09	10 101013 0420	4,01	10 101014 0420	7,10	10 101012 0420	8,90

1104 1104 1104

Continued on next page >>>

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	TiN			TiAlN		
				art.no.	€	art.no.	€	art.no.	€
4.30	80	47	0.09	10 101013 0430	4,07	10 101014 0430	7,75	10 101012 0430	9,65
4.40	80	47	0.09	10 101013 0440	4,07	10 101014 0440	8,15	10 101012 0440	10,15
4.50	80	47	0.09	10 101013 0450	3,97	10 101014 0450	7,85	10 101012 0450	9,80
4.60	80	47	0.09	10 101013 0460	4,07	10 101014 0460	8,15	10 101012 0460	10,20
4.70	80	47	0.09	10 101013 0470	4,07	10 101014 0470	8,15	10 101012 0470	10,15
4.80	86	52	0.09	10 101013 0480	4,07	10 101014 0480	8,40	10 101012 0480	10,30
4.90	86	52	0.09	10 101013 0490	4,15	10 101014 0490	8,50	10 101012 0490	10,60
5.00	86	52	0.09	10 101013 0500	4,15	10 101014 0500	8,30	10 101012 0500	10,35
5.10	86	52	0.13	10 101013 0510	4,37	10 101014 0510	8,35	10 101012 0510	10,40
5.20	86	52	0.13	10 101013 0520	4,37	10 101014 0520	8,35	10 101012 0520	10,40
5.30	86	52	0.13	10 101013 0530	4,37	10 101014 0530	9,60	10 101012 0530	11,90
5.40	93	57	0.13	10 101013 0540	4,80	10 101014 0540	10,40	10 101012 0540	13,-
5.50	93	57	0.13	10 101013 0550	4,56	10 101014 0550	10,-	10 101012 0550	12,50
5.60	93	57	0.13	10 101013 0560	5,15	10 101014 0560	10,40	10 101012 0560	13,05
5.70	93	57	0.13	10 101013 0570	5,15	10 101014 0570	10,30	10 101012 0570	12,90
5.80	93	57	0.13	10 101013 0580	5,15	10 101014 0580	10,40	10 101012 0580	13,05
5.90	93	57	0.13	10 101013 0590	5,15	10 101014 0590	10,60	10 101012 0590	13,30
6.00	93	57	0.13	10 101013 0600	5,05	10 101014 0600	10,20	10 101012 0600	12,70
6.10	101	63	0.13	1 101013 0610	5,80	1 101014 0610	11,15	1 101012 0610	13,95
6.20	101	63	0.13	1 101013 0620	5,80	1 101014 0620	11,15	1 101012 0620	13,95
6.30	101	63	0.13	1 101013 0630	5,80	1 101014 0630	11,20	1 101012 0630	14,-
6.40	101	63	0.13	1 101013 0640	5,65	1 101014 0640	11,25	1 101012 0640	14,10
6.50	101	63	0.13	1 101013 0650	5,80	1 101014 0650	11,20	1 101012 0650	14,-
6.60	101	63	0.13	1 101013 0660	6,45	1 101014 0660	11,20	1 101012 0660	14,-
6.70	101	63	0.13	1 101013 0670	6,45	1 101014 0670	11,25	1 101012 0670	14,10
6.80	109	69	0.13	1 101013 0680	7,60	1 101014 0680	12,55	1 101012 0680	15,70
6.90	109	69	0.13	1 101013 0690	7,60	1 101014 0690	12,45	1 101012 0690	15,60
7.00	109	69	0.13	1 101013 0700	7,45	1 101014 0700	12,90	1 101012 0700	16,05
7.10	109	69	0.13	1 101013 0710	9,25	1 101014 0710	13,55	1 101012 0710	16,90
7.20	109	69	0.13	1 101013 0720	9,25	1 101014 0720	13,40	1 101012 0720	16,70
7.30	109	69	0.13	1 101013 0730	9,25	1 101014 0730	13,80	1 101012 0730	17,20
7.40	109	69	0.13	1 101013 0740	9,25	1 101014 0740	13,70	1 101012 0740	17,10
7.50	109	69	0.13	1 101013 0750	7,80	1 101014 0750	13,25	1 101012 0750	16,50
7.60	117	75	0.13	1 101013 0760	9,95	1 101014 0760	15,75	1 101012 0760	19,65
7.70	117	75	0.13	1 101013 0770	9,95	1 101014 0770	15,35	1 101012 0770	19,20
7.80	117	75	0.13	1 101013 0780	9,95	1 101014 0780	15,55	1 101012 0780	19,45
7.90	117	75	0.13	1 101013 0790	9,95	1 101014 0790	16,25	1 101012 0790	20,30
8.00	117	75	0.13	1 101013 0800	8,25	1 101014 0800	15,55	1 101012 0800	19,45
8.10	117	75	0.18	1 101013 0810	9,95	1 101014 0810	15,95	1 101012 0810	19,90
8.20	117	75	0.18	1 101013 0820	9,95	1 101014 0820	15,75	1 101012 0820	19,75
8.30	117	75	0.18	1 101013 0830	9,95	1 101014 0830	16,65	1 101012 0830	20,90
8.40	117	75	0.18	1 101013 0840	9,70	1 101014 0840	16,65	1 101012 0840	21,-
8.50	117	75	0.18	1 101013 0850	8,70	1 101014 0850	16,05	1 101012 0850	20,10
8.60	125	81	0.18	1 101013 0860	11,65	1 101014 0860	17,45	1 101012 0860	21,90
8.70	125	81	0.18	1 101013 0870	11,65	1 101014 0870	17,25	1 101012 0870	21,60
8.80	125	81	0.18	1 101013 0880	11,65	1 101014 0880	17,75	1 101012 0880	22,20
8.90	125	81	0.18	1 101013 0890	11,65	1 101014 0890	18,05	1 101012 0890	22,50
9.00	125	81	0.18	1 101013 0900	10,-	1 101014 0900	17,35	1 101012 0900	21,70
9.10	125	81	0.18	1 101013 0910	12,30	1 101014 0910	17,45	1 101012 0910	21,90
9.20	125	81	0.18	1 101013 0920	12,30	1 101014 0920	18,35	1 101012 0920	22,90
9.30	125	81	0.18	1 101013 0930	12,80	1 101014 0930	18,15	1 101012 0930	22,60
9.40	125	81	0.18	1 101013 0940	12,80	1 101014 0940	17,90	1 101012 0940	22,40
9.50	125	81	0.18	1 101013 0950	11,20	1 101014 0950	17,90	1 101012 0950	22,40
9.60	133	87	0.18	1 101013 0960	14,-	1 101014 0960	19,05	1 101012 0960	23,70
9.70	133	87	0.18	1 101013 0970	14,-	1 101014 0970	19,55	1 101012 0970	24,50
9.80	133	87	0.18	1 101013 0980	14,-	1 101014 0980	21,30	1 101012 0980	26,70
9.90	133	87	0.18	1 101013 0990	14,-	1 101014 0990	23,60	1 101012 0990	29,60
10.00	133	87	0.18	1 101013 1000	12,65	1 101014 1000	21,-	1 101012 1000	26,30
10.20	133	87	0.18	1 101013 1020	16,90	1 101014 1020	23,80	1 101012 1020	29,80
10.50	133	87	0.18	1 101013 1050	16,90	1 101014 1050	22,50	1 101012 1050	28,20

1104

1104

1104

D mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	TiN			TiAlN					
				art.no.	€	art.no.	€	art.no.	€			
11.00	142	94	0.18	1 101013 1100	18,90	1 101014 1100	24,10	1 101012 1100	30,10			
11.50	142	94	0.18	1 101013 1150	21,50	1 101014 1150	26,90	1 101012 1150	33,50			
11.80	142	94	0.18	1 101013 1180	30,80	1 101014 1180	27,40	1 101012 1180	34,20			
12.00	151	101	0.18	1 101013 1200	22,40	1 101014 1200	28,30	1 101012 1200	35,30			
12.50	151	101	0.22			1 101014 1250	31,10	1 101012 1250	38,90			
13.00	151	101	0.22			1 101014 1300	31,70	1 101012 1300	39,60			
13.50	160	108	0.22			1 101014 1350	42,—	1 101012 1350	52,40			
14.00	160	108	0.22			1 101014 1400	38,50	1 101012 1400	48,10			
14.50	169	114	0.22			1 101014 1450	61,70					
15.00	169	114	0.22			1 101014 1500	46,30	1 101012 1500	57,80			
15.50	178	120	0.22			1 101014 1550	84,30					
16.00	178	120	0.22			1 101014 1600	56,—	1 101012 1600	69,90			
				1104			1104			1104		

**ATORN® Twist drill UNI**

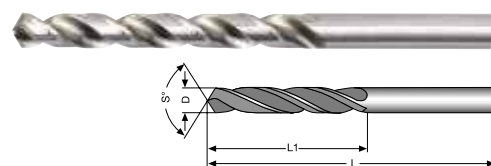
HSS-E
DIN 338
Typ U
118°
38°
h8
5xD
Z 2
i Vc/tz 366

- Special point thinning
- Self-centring
- 4-facet grinding
- **For universal applications**
- Smooth operation
- **Low torque**
- Optimum chip removal with round groove profile

**Universal multi-purpose drill bit**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		25	15	12	12	10		30	35			50	35	30					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1.0	34	12	0.02	10 101040 0100	3,29
1.1	36	14	0.04	10 101040 0110	3,40
1.2	38	16	0.04	10 101040 0120	3,40
1.3	38	16	0.04	10 101040 0130	3,40
1.4	40	18	0.04	10 101040 0140	3,40
1.5	40	18	0.04	10 101040 0150	3,29
1.6	43	20	0.04	10 101040 0160	3,40
1.7	43	20	0.04	10 101040 0170	3,40
1.8	46	22	0.04	10 101040 0180	3,40
1.9	46	22	0.04	10 101040 0190	3,40
2.0	49	24	0.05	10 101040 0200	3,29
2.1	49	24	0.05	10 101040 0210	3,40
2.2	53	27	0.05	10 101040 0220	3,40
2.3	53	27	0.05	10 101040 0230	3,40
2.4	57	30	0.05	10 101040 0240	3,40
2.5	57	30	0.06	10 101040 0250	3,40
2.6	57	30	0.06	10 101040 0260	3,52
2.7	61	33	0.06	10 101040 0270	3,89
2.8	61	33	0.06	10 101040 0280	3,89
2.9	61	33	0.06	10 101040 0290	3,89
3.0	61	33	0.06	10 101040 0300	3,40
3.1	65	36	0.08	10 101040 0310	3,89

1104

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3.2	65	36	0.08	10 101040 0320	3,89
3.3	65	36	0.08	10 101040 0330	3,77
3.4	70	39	0.08	10 101040 0340	4,23
3.5	70	39	0.08	10 101040 0350	4,23
3.6	70	39	0.08	10 101040 0360	4,23
3.7	70	39	0.08	10 101040 0370	4,23
3.8	75	43	0.08	10 101040 0380	4,59
3.9	75	43	0.08	10 101040 0390	4,59
4.0	75	43	0.10	10 101040 0400	4,28
4.1	75	43	0.10	10 101040 0410	4,59
4.2	75	43	0.10	10 101040 0420	4,46
4.3	80	47	0.10	10 101040 0430	4,59
4.4	80	47	0.10	10 101040 0440	4,70
4.5	80	47	0.10	10 101040 0450	4,59
4.6	80	47	0.10	10 101040 0460	4,70
4.7	80	47	0.10	10 101040 0470	4,70
4.8	86	52	0.10	10 101040 0480	4,70
4.9	86	52	0.10	10 101040 0490	4,72
5.0	86	52	0.10	10 101040 0500	4,70
5.1	86	52	0.10	10 101040 0510	4,83
5.2	86	52	0.10	10 101040 0520	4,83
5.3	86	52	0.10	10 101040 0530	4,83

1104

Continued on next page >>>

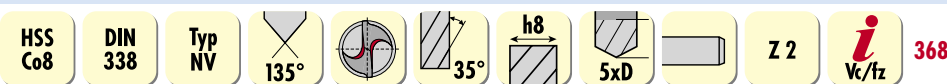
D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
5.4	93	57	0.10	10	101040 0540	5,55
5.5	93	57	0.10	10	101040 0550	5,50
5.6	93	57	0.10	10	101040 0560	6,10
5.7	93	57	0.10	10	101040 0570	6,10
5.8	93	57	0.10	10	101040 0580	6,10
5.9	93	57	0.10	10	101040 0590	6,10
6.0	93	57	0.10	1	101040 0600	5,85
6.1	101	63	0.12	1	101040 0610	6,80
6.2	101	63	0.12	1	101040 0620	6,80
6.3	101	63	0.12	1	101040 0630	6,80
6.4	101	63	0.12	1	101040 0640	6,80
6.5	101	63	0.12	1	101040 0650	6,60
6.6	101	63	0.12	1	101040 0660	7,25
6.7	101	63	0.12	1	101040 0670	7,25
6.8	109	69	0.12	1	101040 0680	8,25
6.9	109	69	0.12	1	101040 0690	8,50
7.0	109	69	0.13	1	101040 0700	8,25
7.1	109	69	0.13	1	101040 0710	10,15
7.2	109	69	0.13	1	101040 0720	10,15
7.3	109	69	0.13	1	101040 0730	10,15
7.4	109	69	0.13	1	101040 0740	10,15
7.5	109	69	0.13	1	101040 0750	8,50
7.6	117	75	0.13	1	101040 0760	10,80
7.7	117	75	0.13	1	101040 0770	10,80
7.8	117	75	0.13	1	101040 0780	10,80
7.9	117	75	0.13	1	101040 0790	10,80
8.0	117	75	0.16	1	101040 0800	8,95

1104

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
8.1	117	75	0.16	1	101040 0810	10,80
8.2	117	75	0.16	1	101040 0820	10,80
8.3	117	75	0.16	1	101040 0830	10,80
8.4	117	75	0.16	1	101040 0840	10,80
8.5	117	75	0.16	1	101040 0850	9,45
8.6	125	81	0.16	1	101040 0860	14,30
8.7	125	81	0.16	1	101040 0870	14,85
8.8	125	81	0.16	1	101040 0880	13,-
8.9	125	81	0.16	1	101040 0890	15,55
9.0	125	81	0.18	1	101040 0900	10,80
9.1	125	81	0.18	1	101040 0910	16,35
9.2	125	81	0.18	1	101040 0920	16,35
9.3	125	81	0.18	1	101040 0930	14,10
9.4	125	81	0.18	1	101040 0940	16,65
9.5	125	81	0.18	1	101040 0950	12,20
9.6	133	87	0.18	1	101040 0960	17,85
9.7	133	87	0.18	1	101040 0970	17,85
9.8	133	87	0.18	1	101040 0980	15,75
9.9	133	87	0.18	1	101040 0990	18,65
10.0	133	87	0.20	1	101040 1000	13,70
10.2	133	87	0.20	1	101040 1020	18,25
10.5	133	87	0.20	1	101040 1050	18,65
11.0	142	94	0.20	1	101040 1100	21,-
11.5	142	94	0.20	1	101040 1150	23,90
12.0	151	101	0.20	1	101040 1200	24,40
12.5	151	101	0.20	1	101040 1250	30,40
13.0	151	101	0.20	1	101040 1300	34,40

1104

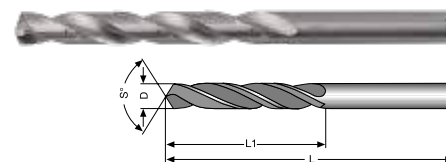
### ATORN® Twist drill bit



- Self-centring
- With reinforced core
- HSS cutting material with increased heat resistance

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	●	●		○	●	●	○	○			●					
		30	20	10	20	10		30	30	7	6	6			45					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L mm	L1 mm	Feed f steel < 1400 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
1.00	34	12	0.03	10	101016 0100	2,06
1.10	36	14	0.03	10	101016 0110	2,16
1.20	38	16	0.03	10	101016 0120	2,06
1.30	38	16	0.03	10	101016 0130	2,44
1.40	40	18	0.03	10	101016 0140	2,16
1.50	40	18	0.03	10	101016 0150	2,11
1.60	43	20	0.03	10	101016 0160	2,11
1.70	43	20	0.03	10	101016 0170	2,16
1.80	46	22	0.03	10	101016 0180	2,44
1.90	46	22	0.03	10	101016 0190	2,55
2.00	49	24	0.03	10	101016 0200	2,16


1104

D mm	L mm	L1 mm	Feed f steel < 1400 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
2.10	49	24	0.03	10	101016 0210	2,55
2.20	53	27	0.04	10	101016 0220	2,55
2.30	53	27	0.04	10	101016 0230	2,78
2.40	57	30	0.04	10	101016 0240	2,38
2.50	57	30	0.04	10	101016 0250	2,11
2.60	57	30	0.04	10	101016 0260	2,55
2.70	61	33	0.04	10	101016 0270	2,94
2.80	61	33	0.04	10	101016 0280	2,67
2.90	61	33	0.04	10	101016 0290	2,83
3.00	61	33	0.04	10	101016 0300	2,38
3.10	65	36	0.04	10	101016 0310	2,55

1104

D mm	L mm	L1 mm	Feed f steel < 1400 N/mm <sup>2</sup> mm/rev		art.no.	€
3.20	65	36	0.04	10	101016 0320	2,11
3.30	65	36	0.04	10	101016 0330	2,11
3.40	70	39	0.05	10	101016 0340	2,67
3.50	70	39	0.05	10	101016 0350	2,27
3.60	70	39	0.05	10	101016 0360	3,11
3.70	70	39	0.05	10	101016 0370	3,67
3.80	75	43	0.05	10	101016 0380	3,06
3.90	75	43	0.05	10	101016 0390	3,48
4.00	75	43	0.05	10	101016 0400	2,73
4.10	75	43	0.05	10	101016 0410	2,94
4.20	75	43	0.05	10	101016 0420	3,11
4.30	80	47	0.06	10	101016 0430	3,48
4.40	80	47	0.06	10	101016 0440	3,72
4.50	80	47	0.06	10	101016 0450	2,99
4.60	80	47	0.06	10	101016 0460	3,67
4.70	80	47	0.06	10	101016 0470	4,11
4.80	86	52	0.06	10	101016 0480	3,72
4.90	86	52	0.06	10	101016 0490	4,65
5.00	86	52	0.06	10	101016 0500	3,38
5.10	86	52	0.07	10	101016 0510	3,77
5.20	86	52	0.07	10	101016 0520	4,44
5.30	86	52	0.07	10	101016 0530	4,65
5.40	93	57	0.07	10	101016 0540	5,15
5.50	93	57	0.07	10	101016 0550	4,77
5.60	93	57	0.07	10	101016 0560	5,65
5.70	93	57	0.07	10	101016 0570	5,55
5.80	93	57	0.07	10	101016 0580	5,55
5.90	93	57	0.08	10	101016 0590	5,45
6.00	93	57	0.08	10	101016 0600	4,44
6.10	101	63	0.08	1	101016 0610	6,05
6.20	101	63	0.08	1	101016 0620	6,40
6.30	101	63	0.08	1	101016 0630	6,50
6.40	101	63	0.08	1	101016 0640	6,50
6.50	101	63	0.08	1	101016 0650	5,65
6.60	101	63	0.08	1	101016 0660	6,10
6.70	101	63	0.08	1	101016 0670	6,50
6.80	109	69	0.09	1	101016 0680	5,75
6.90	109	69	0.09	1	101016 0690	7,50
7.00	109	69	0.09	1	101016 0700	5,85

1104

D mm	L mm	L1 mm	Feed f steel < 1400 N/mm <sup>2</sup> mm/rev		art.no.	€
7.10	109	69	0.09	1	101016 0710	8,30
7.20	109	69	0.09	1	101016 0720	8,90
7.30	109	69	0.09	1	101016 0730	8,65
7.40	109	69	0.09	1	101016 0740	10,55
7.50	109	69	0.09	1	101016 0750	7,30
7.60	117	75	0.1	1	101016 0760	11,10
7.70	117	75	0.1	1	101016 0770	11,45
7.80	117	75	0.1	1	101016 0780	10,50
7.90	117	75	0.1	1	101016 0790	10,50
8.00	117	75	0.1	1	101016 0800	11,05
8.10	117	75	0.1	1	101016 0810	10,75
8.20	117	75	0.1	1	101016 0820	12,80
8.30	117	75	0.1	1	101016 0830	11,95
8.40	117	75	0.1	1	101016 0840	11,80
8.50	117	75	0.11	1	101016 0850	8,85
8.60	125	81	0.11	1	101016 0860	11,20
8.70	125	81	0.11	1	101016 0870	12,30
8.80	125	81	0.11	1	101016 0880	10,85
8.90	125	81	0.11	1	101016 0890	14,20
9.00	125	81	0.11	1	101016 0900	11,80
9.10	125	81	0.11	1	101016 0910	14,55
9.20	125	81	0.11	1	101016 0920	14,85
9.30	125	81	0.11	1	101016 0930	14,25
9.40	125	81	0.11	1	101016 0940	16,05
9.50	125	81	0.12	1	101016 0950	13,90
9.60	133	87	0.12	1	101016 0960	14,55
9.70	133	87	0.12	1	101016 0970	13,85
9.80	133	87	0.12	1	101016 0980	16,85
9.90	133	87	0.12	1	101016 0990	17,05
10.00	133	87	0.12	1	101016 1000	13,25
10.10	133	87	0.12	1	101016 1010	14,95
10.20	133	87	0.12	1	101016 1020	16,25
10.50	133	87	0.13	1	101016 1050	15,95
11.00	142	94	0.13	1	101016 1100	17,35
11.50	142	94	0.14	1	101016 1150	22,70
11.80	142	94	0.14	1	101016 1180	22,70
12.00	151	101	0.14	1	101016 1200	19,05
12.50	151	101	0.15	1	101016 1250	26,30
13.00	151	101	0.15	1	101016 1300	22,20

1104





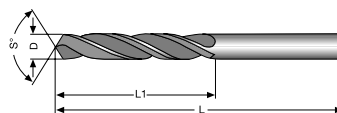
# ATORN® Stainless steel twist drill

HSS-E
DIN 338
Typ VA
130°
40°
h8
5xD
Z 2
i Vc/tz
368

- Self-centring
- Specially designed for machining stainless steel

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		30	25		15	12													

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L mm	L1 mm	Feed f stainless steel mm/rev	☒	art.no.	€
1.0	34	12	0.04	10	101018 0100	2,96
1.1	36	14	0.04	10	101018 0110	3,50
1.2	38	16	0.04	10	101018 0120	3,50
1.3	38	16	0.04	10	101018 0130	3,67
1.4	40	18	0.04	10	101018 0140	3,39
1.5	40	18	0.04	10	101018 0150	3,13
1.6	43	20	0.04	10	101018 0160	3,39
1.7	43	20	0.04	10	101018 0170	3,39
1.8	46	22	0.04	10	101018 0180	3,62
1.9	46	22	0.04	10	101018 0190	4,04
2.0	49	24	0.04	10	101018 0200	2,96
2.1	49	24	0.04	10	101018 0210	3,50
2.2	53	27	0.04	10	101018 0220	3,67
2.3	53	27	0.04	10	101018 0230	4,96
2.4	57	30	0.04	10	101018 0240	4,80
2.5	57	30	0.04	10	101018 0250	3,50
2.6	57	30	0.04	10	101018 0260	4,14
2.7	61	33	0.04	10	101018 0270	5,10
2.8	61	33	0.04	10	101018 0280	4,96
2.9	61	33	0.04	10	101018 0290	5,35
3.0	61	33	0.05	10	101018 0300	3,67
3.1	65	36	0.05	10	101018 0310	4,47
3.2	65	36	0.05	10	101018 0320	4,14
3.3	65	36	0.05	10	101018 0330	3,93
3.4	70	39	0.05	10	101018 0340	4,57
3.5	70	39	0.05	10	101018 0350	3,93
3.6	70	39	0.05	10	101018 0360	5,45
3.7	70	39	0.05	10	101018 0370	4,96
3.8	75	43	0.05	10	101018 0380	6,25
3.9	75	43	0.05	10	101018 0390	6,50
4.0	75	43	0.05	10	101018 0400	4,47
4.1	75	43	0.05	10	101018 0410	6,30
4.2	75	43	0.05	10	101018 0420	4,74
4.3	80	47	0.05	10	101018 0430	5,45
4.4	80	47	0.05	10	101018 0440	6,30
4.5	80	47	0.05	10	101018 0450	5,30
4.6	80	47	0.05	10	101018 0460	7,05
4.7	80	47	0.05	10	101018 0470	7,35
4.8	86	52	0.05	10	101018 0480	5,95
4.9	86	52	0.05	10	101018 0490	7,50
5.0	86	52	0.05	10	101018 0500	5,10
5.1	86	52	0.08	10	101018 0510	5,95
5.2	86	52	0.08	10	101018 0520	5,65
5.3	86	52	0.08	10	101018 0530	6,75
5.4	93	57	0.08	10	101018 0540	9,05
5.5	93	57	0.08	10	101018 0550	6,10
5.6	93	57	0.08	10	101018 0560	9,15
5.7	93	57	0.08	10	101018 0570	15,40
5.8	93	57	0.08	10	101018 0580	6,50

1104

D mm	L mm	L1 mm	Feed f stainless steel mm/rev	☒	art.no.	€
5.9	93	57	0.08	10	101018 0590	9,15
6.0	93	57	0.08	10	101018 0600	6,55
6.1	101	63	0.08	1	101018 0610	8,85
6.2	101	63	0.08	1	101018 0620	8,40
6.3	101	63	0.08	1	101018 0630	7,80
6.4	101	63	0.08	1	101018 0640	9,15
6.5	101	63	0.08	1	101018 0650	7,80
6.6	101	63	0.08	1	101018 0660	9,60
6.7	101	63	0.08	1	101018 0670	10,-
6.8	109	69	0.08	1	101018 0680	8,70
6.9	109	69	0.08	1	101018 0690	10,85
7.0	109	69	0.08	1	101018 0700	8,85
7.1	109	69	0.08	1	101018 0710	12,60
7.2	109	69	0.08	1	101018 0720	13,15
7.3	109	69	0.08	1	101018 0730	13,45
7.4	109	69	0.08	1	101018 0740	12,80
7.5	109	69	0.08	1	101018 0750	9,75
7.6	117	75	0.08	1	101018 0760	17,65
7.7	117	75	0.08	1	101018 0770	15,05
7.8	117	75	0.08	1	101018 0780	13,95
7.9	117	75	0.08	1	101018 0790	17,65
8.0	117	75	0.08	1	101018 0800	10,85
8.1	117	75	0.11	1	101018 0810	13,15
8.2	117	75	0.11	1	101018 0820	13,40
8.3	117	75	0.11	1	101018 0830	14,15
8.4	117	75	0.11	1	101018 0840	15,65
8.5	117	75	0.11	1	101018 0850	11,60
8.6	125	81	0.11	1	101018 0860	15,40
8.7	125	81	0.11	1	101018 0870	16,45
8.8	125	81	0.11	1	101018 0880	17,25
8.9	125	81	0.11	1	101018 0890	22,20
9.0	125	81	0.11	1	101018 0900	14,-
9.1	125	81	0.11	1	101018 0910	16,55
9.2	125	81	0.11	1	101018 0920	18,45
9.3	125	81	0.11	1	101018 0930	18,15
9.4	125	81	0.11	1	101018 0940	20,20
9.5	125	81	0.11	1	101018 0950	14,70
9.6	133	87	0.11	1	101018 0960	18,65
9.7	133	87	0.11	1	101018 0970	20,90
9.8	133	87	0.11	1	101018 0980	19,15
9.9	133	87	0.11	1	101018 0990	21,60
10.0	133	87	0.11	1	101018 1000	17,35
10.2	133	87	0.11	1	101018 1020	21,70
10.5	133	87	0.11	1	101018 1050	18,35
11.0	142	94	0.11	1	101018 1100	23,-
11.5	142	94	0.11	1	101018 1150	24,90
11.8	142	94	0.11	1	101018 1180	29,40
12.0	151	101	0.11	1	101018 1200	27,60
13.0	151	101	0.14	1	101018 1300	55,-

1104

## ATORN® Twist drill, with 3 surface shank

HSS-E HSS-E DIN 338 Typ VA 135° 40° h8 5xD Z 2 i Vc/fz 368

- **3-facet grinding** on shank (from Ø 4 mm) for optimum transfer of force and secure hold in the drill chuck, no possibility of slippage
- Low force application when opening and closing in the drill chuck
- **Special surface treatment** in conjunction with relief grinding for maximum lubricant adhesion and for fast, reliable chip removal
- Designed especially for use on portable drilling machines

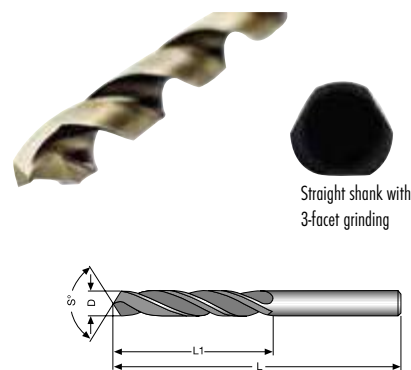
**also ideal for stainless steel**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		30	20		10	8						70	50	35					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D h8 mm	L mm	L1 mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
2.0	49	24	0.04	10 101076 0020	2,91
2.5	57	30	0.04	10 101076 0025	3,02
3.0	61	33	0.05	10 101076 0030	3,02
3.2	65	36	0.05	10 101076 0032	3,30
3.3	65	36	0.05	10 101076 0033	3,53
3.5	70	39	0.05	10 101076 0035	3,53
4.0	75	43	0.07	10 101076 0040	4,09
4.2	75	43	0.07	10 101076 0042	4,09
4.5	80	47	0.07	10 101076 0045	4,32
5.0	86	52	0.08	10 101076 0050	4,45
5.2	86	52	0.08	10 101076 0052	5,80
5.5	93	57	0.08	10 101076 0055	4,89
6.0	93	57	0.10	1 101076 0060	5,25
6.5	101	63	0.10	1 101076 0065	5,65
6.8	109	69	0.10	1 101076 0068	6,15
7.0	109	69	0.11	1 101076 0070	6,20
7.5	109	69	0.11	1 101076 0075	6,40
8.0	117	75	0.12	1 101076 0080	7,20
8.5	117	75	0.12	1 101076 0085	7,80
9.0	125	81	0.13	1 101076 0090	9,80
9.5	125	81	0.13	1 101076 0095	10,10
10.0	133	87	0.15	1 101076 0100	11,15
10.2	133	87	0.15	1 101076 0102	14,65
10.5	133	87	0.15	1 101076 0105	14,65
11.0	142	94	0.15	1 101076 0110	16,60
11.5	142	94	0.15	1 101076 0115	18,95
12.0	151	101	0.16	1 101076 0120	20,50
12.5	151	101	0.16	1 101076 0125	22,80
13.0	151	101	0.16	1 101076 0130	23,10

1104



Straight shank with 3-facet grinding



Ground sharp ...

... optimal chip control.

**ATORN®**  
Performance demands quality

## ATORN® Twist drill bit sets, with 3 surface shank

HSS-E
DIN 338
Typ VA
135°
40°
h8
5xD
Z 2
i Vc/fz
368

- **3-facet grinding** on shank (from Ø 4 mm) for optimum transfer of force and secure hold in the drill chuck, no possibility of slippage
- Low force application when opening and closing in the drill chuck
- **Special surface treatment** in conjunction with relief grinding for maximum lubricant adhesion and for fast, reliable chip removal
- Designed especially for use on portable drilling machines



101076 0003

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		30	20		10	8							70	50	35					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Number of drills	D mm	Contents	art.no.	€
6	2.0 - 8.0	6 pcs., Ø 2 3 4 5 6 8 mm	101076 0001	32,40
19	1.0 - 10.0	19 pcs., Ø 1 1.5 2 2.5 3 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10 mm	101076 0002	107,-
25	1.0 - 13.0	25 pcs., Ø 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10 10.5 11 11.5 12 12.5 13 mm	101076 0003	226,-

1104

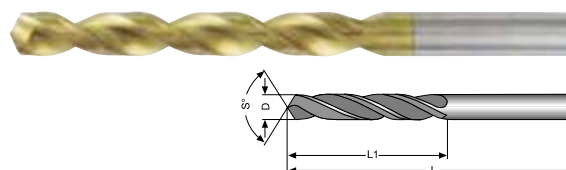
## ATORN® KSB-5D twist drill

HSS-E PM
DIN 338
118°
38°
h8
5xD
Z 2
TiN
i Vc/fz
369

- Self-centring
- Low wear on cutting edges
- Especially resistant to high temperatures
- Extended service life
- Excellent chip removal
- **Short chips**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		50	35	15	12	10		45	40	12	12	12	90	80	80	15	4		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
1.00	12	34	0.03	101095 0100	14,45
1.10	14	36	0.03	101095 0110	14,65
1.20	16	38	0.03	101095 0120	14,85
1.30	16	38	0.03	101095 0130	15,80
1.40	18	40	0.03	101095 0140	14,65
1.50	18	40	0.03	101095 0150	13,70
1.60	20	43	0.03	101095 0160	14,20
1.70	20	43	0.03	101095 0170	14,40
1.80	22	46	0.03	101095 0180	14,20
1.90	22	46	0.03	101095 0190	14,40
2.00	24	49	0.03	101095 0200	11,45

1106

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
2.10	24	49	0.03	101095 0210	13,30
2.20	27	53	0.04	101095 0220	14,65
2.30	27	53	0.04	101095 0230	14,65
2.40	30	57	0.04	101095 0240	15,10
2.50	30	57	0.04	101095 0250	12,65
2.60	30	57	0.04	101095 0260	16,-
2.70	33	61	0.04	101095 0270	14,85
2.80	33	61	0.04	101095 0280	16,40
2.90	33	61	0.04	101095 0290	14,40
3.00	33	61	0.04	101095 0300	10,80
3.10	36	65	0.04	101095 0310	11,20

1106

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3.20	36	65	0.04	101095 0320	11,20
3.30	36	65	0.05	101095 0330	11,-
3.40	39	70	0.05	101095 0340	11,-
3.50	39	70	0.05	101095 0350	11,20
3.60	39	70	0.05	101095 0360	11,70
3.70	39	70	0.06	101095 0370	12,20
3.80	43	75	0.06	101095 0380	12,65
3.90	43	75	0.06	101095 0390	12,90
4.00	43	75	0.06	101095 0400	12,40
4.10	43	75	0.06	101095 0410	13,50
4.20	43	75	0.07	101095 0420	13,50
4.30	47	80	0.07	101095 0430	14,20
4.40	47	80	0.07	101095 0440	14,40
4.50	47	80	0.07	101095 0450	14,40
4.60	47	80	0.08	101095 0460	15,10
4.70	47	80	0.08	101095 0470	15,60
4.80	52	86	0.08	101095 0480	16,-
4.90	52	86	0.08	101095 0490	16,-
5.00	52	86	0.08	101095 0500	16,40
5.10	52	86	0.09	101095 0510	17,30
5.20	52	86	0.09	101095 0520	17,50
5.30	52	86	0.09	101095 0530	17,90
5.40	57	93	0.09	101095 0540	18,55
5.50	57	93	0.1	101095 0550	18,55
5.60	57	93	0.1	101095 0560	29,10
5.70	57	93	0.1	101095 0570	29,50
5.80	57	93	0.1	101095 0580	30,70
5.90	57	93	0.1	101095 0590	30,70
6.00	57	93	0.11	101095 0600	21,-
6.10	63	101	0.11	101095 0610	32,20
6.20	63	101	0.11	101095 0620	32,60
6.30	63	101	0.11	101095 0630	33,30
6.40	63	101	0.12	101095 0640	34,-
6.50	63	101	0.12	101095 0650	22,70
6.60	63	101	0.12	101095 0660	35,30
6.70	63	101	0.12	101095 0670	36,30

1106

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
6.80	69	109	0.12	101095 0680	35,50
6.90	69	109	0.13	101095 0690	37,80
7.00	69	109	0.13	101095 0700	24,80
7.10	69	109	0.13	101095 0710	39,-
7.20	69	109	0.13	101095 0720	39,20
7.30	69	109	0.14	101095 0730	39,20
7.40	69	109	0.14	101095 0740	40,90
7.50	69	109	0.14	101095 0750	27,40
7.60	75	117	0.14	101095 0760	42,10
7.70	75	117	0.14	101095 0770	42,80
7.80	75	117	0.15	101095 0780	43,40
7.90	75	117	0.15	101095 0790	44,-
8.00	75	117	0.15	101095 0800	29,90
8.10	75	117	0.15	101095 0810	45,90
8.20	75	117	0.15	101095 0820	46,60
8.30	75	117	0.15	101095 0830	47,40
8.40	75	117	0.15	101095 0840	48,-
8.50	75	117	0.15	101095 0850	31,80
8.80	81	125	0.16	101095 0880	50,90
9.00	81	125	0.16	101095 0900	34,90
9.30	81	125	0.16	101095 0930	55,-
9.50	81	125	0.16	101095 0950	38,-
9.80	87	133	0.16	101095 0980	42,10
10.00	87	133	0.16	101095 1000	40,30
10.20	87	133	0.16	101095 1020	61,60
10.30	87	133	0.16	101095 1030	65,10
10.50	87	133	0.17	101095 1050	44,90
11.00	94	142	0.17	101095 1100	48,40
11.50	94	142	0.17	101095 1150	52,90
12.00	101	151	0.18	101095 1200	56,-
12.30	101	151	0.18	101095 1230	92,60
12.50	101	151	0.18	101095 1250	65,10
12.70	101	151	0.18	101095 1270	67,70
13.00	101	151	0.18	101095 1300	71,20
13.50	108	160	0.18	101095 1350	78,90
14.00	108	160	0.19	101095 1400	82,90

1106



Multifunctional ...

... with indexable insert.

**ATORN**<sup>®</sup>  
Performance demands quality

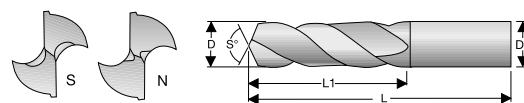
# EX-SUS-GDR twist drill bit

HSS-E V3
Typ VA
120°
130°
35°-40°
5xD
TiN
Vc/fz
365

- Large chip spaces, high toughness
- **Reduced heat build-up**
- Shank design: straight
- **From Ø 12.1 with driving plane in accordance with DIN 1835B**
- S° = point angle: ≤ 4 mm = 130°, > 4 mm = 120°
- Centring geometry: up to Ø 13 mm S version, from Ø 13.5 mm N version
- Available on request: Intermediate dimensions from Ø 2 to Ø 6 mm (in 0.01 mm increments)

material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Cu-alloy	ERP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc		
	●	○		●	●	○				●		●	●	●						
				15-20	13-18	8-12				6-8		63-100	32-63	25-50						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	L mm	L1 mm	D1 mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
2.0	56	24	3	0.07	114050 0200	12,50
2.1	56	24	3	0.07	114050 0210	14,70
2.2	59	27	3	0.07	114050 0220	14,70
2.3	59	27	3	0.07	114050 0230	14,70
2.4	62	30	3	0.07	114050 0240	14,70
2.5	62	30	3	0.11	114050 0250	13,90
2.6	62	30	3	0.11	114050 0260	14,70
2.7	65	33	3	0.11	114050 0270	14,70
2.8	65	33	3	0.11	114050 0280	14,70
2.9	65	33	3	0.11	114050 0290	14,70
3.0	65	33	3	0.11	114050 0300	14,70
3.1	68	36	4	0.11	114050 0310	16,50
3.2	68	36	4	0.11	114050 0320	16,50
3.3	68	36	4	0.11	114050 0330	16,50
3.4	71	39	4	0.11	114050 0340	16,50
3.5	71	39	4	0.13	114050 0350	16,50
3.6	71	39	4	0.13	114050 0360	18,-
3.7	71	39	4	0.13	114050 0370	18,-
3.8	75	43	4	0.13	114050 0380	18,-
3.9	75	43	4	0.13	114050 0390	18,-
4.0	75	43	4	0.13	114050 0400	18,-
4.1	87	43	6	0.13	114050 0410	21,40
4.2	87	43	6	0.13	114050 0420	20,20
4.3	91	47	6	0.13	114050 0430	21,40
4.4	91	47	6	0.13	114050 0440	21,40
4.5	91	47	6	0.15	114050 0450	21,40
4.6	91	47	6	0.15	114050 0460	24,20
4.7	91	47	6	0.15	114050 0470	24,20
4.8	96	52	6	0.15	114050 0480	24,20
4.9	96	52	6	0.15	114050 0490	24,20
5.0	96	52	6	0.15	114050 0500	27,-
5.1	96	52	6	0.15	114050 0510	27,-
5.2	96	52	6	0.15	114050 0520	27,-
5.3	96	52	6	0.15	114050 0530	28,50
5.4	101	57	6	0.15	114050 0540	28,50
5.5	101	57	6	0.16	114050 0550	27,-
5.6	101	57	6	0.16	114050 0560	30,70

1107

D h8 mm	L mm	L1 mm	D1 mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
5.7	101	57	6	0.16	114050 0570	30,70
5.8	101	57	6	0.16	114050 0580	30,70
5.9	101	57	6	0.16	114050 0590	30,70
6.0	101	57	6	0.16	114050 0600	29,20
6.1	107	63	8	0.16	114050 0610	35,60
6.2	107	63	8	0.16	114050 0620	35,60
6.3	107	63	8	0.16	114050 0630	35,60
6.4	107	63	8	0.16	114050 0640	35,60
6.5	107	63	8	0.16	114050 0650	35,60
6.6	107	63	8	0.16	114050 0660	36,50
6.7	107	63	8	0.16	114050 0670	36,50
6.8	113	69	8	0.16	114050 0680	36,50
6.9	113	69	8	0.16	114050 0690	36,50
7.0	113	69	8	0.16	114050 0700	36,50
7.1	113	69	8	0.20	114050 0710	38,40
7.2	113	69	8	0.20	114050 0720	38,40
7.3	113	69	8	0.20	114050 0730	38,40
7.4	113	69	8	0.20	114050 0740	38,40
7.5	113	69	8	0.20	114050 0750	38,40
7.6	119	75	8	0.20	114050 0760	40,20
7.7	119	75	8	0.20	114050 0770	40,20
7.8	119	75	8	0.20	114050 0780	40,20
7.9	119	75	8	0.20	114050 0790	40,20
8.0	119	75	8	0.20	114050 0800	40,20
8.1	125	75	10	0.20	114050 0810	43,70
8.2	125	75	10	0.20	114050 0820	43,70
8.3	125	75	10	0.20	114050 0830	43,70
8.4	125	75	10	0.20	114050 0840	43,70
8.5	125	75	10	0.20	114050 0850	43,70
8.6	131	81	10	0.20	114050 0860	46,20
8.7	131	81	10	0.20	114050 0870	46,20
8.8	131	81	10	0.20	114050 0880	46,20
8.9	131	81	10	0.20	114050 0890	46,20
9.0	131	81	10	0.20	114050 0900	46,20
9.1	131	81	10	0.24	114050 0910	50,30
9.2	131	81	10	0.24	114050 0920	50,30
9.3	131	81	10	0.24	114050 0930	50,30

1107



D h8 mm	L mm	L1 mm	D1 mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	art.no.	€
9.4	131	81	10	0.24	114050 0940	50,30
9.5	131	81	10	0.24	114050 0950	50,30
9.6	137	87	10	0.24	114050 0960	55,20
9.7	137	87	10	0.24	114050 0970	55,20
9.8	137	87	10	0.24	114050 0980	55,20
9.9	137	87	10	0.24	114050 0990	55,20
10.0	137	87	10	0.24	114050 1000	55,20
10.1	144	87	12	0.24	114050 1010	68,20
10.2	144	87	12	0.24	114050 1020	68,20
10.3	144	87	12	0.24	114050 1030	68,20
10.4	144	87	12	0.24	114050 1040	68,20
10.5	144	87	12	0.24	114050 1050	68,20
10.6	144	87	12	0.24	114050 1060	74,30
10.7	151	94	12	0.24	114050 1070	74,30
10.8	151	94	12	0.24	114050 1080	74,30
10.9	151	94	12	0.24	114050 1090	74,30
11.0	151	94	12	0.24	114050 1100	74,30
11.1	151	94	12	0.29	114050 1110	80,20
11.2	151	94	12	0.29	114050 1120	80,20
11.3	151	94	12	0.29	114050 1130	80,20
11.4	151	94	12	0.29	114050 1140	80,20
11.5	151	94	12	0.29	114050 1150	80,20
11.6	151	94	12	0.29	114050 1160	86,70
11.7	151	94	12	0.29	114050 1170	86,70
11.8	151	94	12	0.29	114050 1180	86,70
11.9	158	101	12	0.29	114050 1190	86,70

1107

D h8 mm	L mm	L1 mm	D1 mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	art.no.	€
12.0	158	101	12	0.29	114050 1200	86,70
12.1	158	101	16	0.29	114050 1210	98,90
12.2	158	101	16	0.29	114050 1220	98,90
12.3	158	101	16	0.29	114050 1230	98,90
12.4	158	101	16	0.29	114050 1240	98,90
12.5	158	101	16	0.29	114050 1250	98,90
12.6	158	101	16	0.29	114050 1260	104,50
12.7	158	101	16	0.29	114050 1270	104,50
12.8	158	101	16	0.29	114050 1280	104,50
12.9	158	101	16	0.29	114050 1290	104,50
13.0	158	101	16	0.29	114050 1300	104,50
13.5	166	106	16	0.33	114050 1350	135,60
14.0	166	106	16	0.33	114050 1400	135,60
14.5	169	109	16	0.33	114050 1450	149,40
15.0	169	109	16	0.33	114050 1500	156,10
15.5	172	112	16	0.36	114050 1550	167,70
16.0	172	112	16	0.36	114050 1600	167,70
16.5	181	115	20	0.36	114050 1650	175,30
17.0	181	115	20	0.36	114050 1700	175,30
17.5	184	118	20	0.40	114050 1750	192,30
18.0	184	118	20	0.40	114050 1800	192,30
18.5	188	122	20	0.40	114050 1850	211,40
19.0	188	122	20	0.40	114050 1900	219,30
19.5	191	125	20	0.43	114050 1950	226,40
20.0	191	125	20	0.43	114050 2000	226,40

1107



# DRILLING THREADING MILLING



OSG  
Catalogue VI  
1024 pages  
Art.no. 019900 0208

Overview of all free manufacturers' catalogues  
on page 16/17

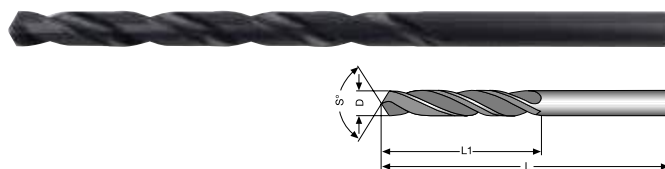
# ATORN® Twist drill bit

HSS
DIN 340
Typ N
118°
30°
h8
10xD
Z 2
Vap.
Vc/fz 366

- For deep bores (multiple chip removal)
- vapour-treated from Ø 2.4 mm, point thinning from Ø ≥ 1 mm
- Profile-ground to meet the highest demands for process reliability
- Pilot hole recommended

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		●	○		○			●	○			○	○	○	○				
		30	20		10			25	25			60	40	50	10				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	☒	art.no.	€
0.60	15	35	0.01	10	101060 0060	6,55
0.80	29	46	0.01	10	101060 0080	4,98
1.00	33	56	0.02	10	101060 0100	4,05
1.10	37	60	0.02	10	101060 0110	4,22
1.20	41	65	0.02	10	101060 0120	4,03
1.25	41	65	0.02	10	101060 0125	6,20
1.30	41	65	0.02	10	101060 0130	3,66
1.40	45	70	0.02	10	101060 0140	3,42
1.50	45	70	0.02	10	101060 0150	2,94
1.60	50	76	0.02	10	101060 0160	3,05
1.70	50	76	0.02	10	101060 0170	3,05
1.80	53	80	0.02	10	101060 0180	3,05
1.90	53	80	0.02	10	101060 0190	3,05
2.00	56	85	0.05	10	101060 0200	2,05
2.10	56	85	0.05	10	101060 0210	2,42
2.20	59	90	0.05	10	101060 0220	2,42
2.30	59	90	0.05	10	101060 0230	2,42
2.40	62	95	0.05	10	101060 0240	2,42
2.50	62	95	0.06	10	101060 0250	2,14
2.60	62	95	0.06	10	101060 0260	2,62
2.70	66	100	0.06	10	101060 0270	2,69
2.80	66	100	0.06	10	101060 0280	2,69
2.90	66	100	0.06	10	101060 0290	2,70
3.00	66	100	0.06	10	101060 0300	2,19
3.10	69	106	0.08	10	101060 0310	2,70
3.20	69	106	0.08	10	101060 0320	2,32
3.30	69	106	0.08	10	101060 0330	2,62
3.40	73	112	0.08	10	101060 0340	2,87
3.50	73	112	0.08	10	101060 0350	2,52
3.60	73	112	0.08	10	101060 0360	2,78
3.70	73	112	0.08	10	101060 0370	2,95
3.80	78	119	0.08	10	101060 0380	2,95
3.90	78	119	0.08	10	101060 0390	3,20
4.00	78	119	0.10	10	101060 0400	2,79
4.10	78	119	0.10	10	101060 0410	2,84
4.20	78	119	0.10	10	101060 0420	2,84
4.30	82	126	0.10	10	101060 0430	3,58
4.40	82	126	0.10	10	101060 0440	3,73
4.50	82	126	0.10	10	101060 0450	3,18
4.60	82	126	0.10	10	101060 0460	3,91

1104

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	☒	art.no.	€
4.70	82	126	0.10	10	101060 0470	3,98
4.80	87	132	0.10	10	101060 0480	3,77
4.90	87	132	0.10	10	101060 0490	3,73
5.00	87	132	0.10	10	101060 0500	3,52
5.10	87	132	0.10	10	101060 0510	3,73
5.20	87	132	0.10	10	101060 0520	3,88
5.30	87	132	0.10	10	101060 0530	4,07
5.40	91	139	0.10	10	101060 0540	5,15
5.50	91	139	0.10	10	101060 0550	4,08
5.60	91	139	0.10	10	101060 0560	5,25
5.70	91	139	0.10	10	101060 0570	5,10
5.80	91	139	0.10	10	101060 0580	4,09
5.90	91	139	0.10	10	101060 0590	5,30
6.00	91	139	0.10	10	101060 0600	4,42
6.10	97	148	0.10	1	101060 0610	5,50
6.20	97	148	0.10	1	101060 0620	4,61
6.30	97	148	0.13	1	101060 0630	5,65
6.40	97	148	0.13	1	101060 0640	5,80
6.50	97	148	0.13	1	101060 0650	4,73
6.60	97	148	0.13	1	101060 0660	5,90
6.70	97	148	0.13	1	101060 0670	5,75
6.80	102	156	0.13	1	101060 0680	6,95
6.90	102	156	0.13	1	101060 0690	7,90
7.00	102	156	0.13	1	101060 0700	5,65
7.10	102	156	0.13	1	101060 0710	10,75
7.20	102	156	0.13	1	101060 0720	7,60
7.30	102	156	0.13	1	101060 0730	9,40
7.40	102	156	0.13	1	101060 0740	12,35
7.50	102	156	0.13	1	101060 0750	6,70
7.60	102	156	0.13	1	101060 0760	8,15
7.70	109	165	0.13	1	101060 0770	8,60
7.80	109	165	0.13	1	101060 0780	8,15
7.90	109	165	0.13	1	101060 0790	8,60
8.00	109	165	0.16	1	101060 0800	6,75
8.10	109	165	0.16	1	101060 0810	8,95
8.20	109	165	0.16	1	101060 0820	8,15
8.30	109	165	0.16	1	101060 0830	9,85
8.40	109	165	0.16	1	101060 0840	8,95
8.50	109	165	0.16	1	101060 0850	7,95
8.60	115	175	0.16	1	101060 0860	10,65

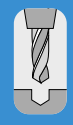
1104

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
8.70	115	175	0.16	1	101060 0870	10,60
8.80	115	175	0.16	1	101060 0880	10,65
8.90	115	175	0.16	1	101060 0890	19,75
9.00	115	175	0.18	1	101060 0900	8,35
9.10	115	175	0.18	1	101060 0910	13,25
9.20	115	175	0.18	1	101060 0920	18,15
9.30	115	175	0.18	1	101060 0930	18,25
9.40	115	175	0.18	1	101060 0940	14,75
9.50	115	175	0.18	1	101060 0950	10,10
9.60	121	184	0.18	1	101060 0960	10,95
9.70	121	184	0.18	1	101060 0970	12,55
9.80	121	184	0.18	1	101060 0980	13,40
9.90	121	184	0.18	1	101060 0990	16,95
10.00	121	184	0.20	1	101060 1000	9,90

1104

D mm	L1 mm	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
10.20	121	184	0.20	1	101060 1020	12,55
10.25	121	184	0.20	1	101060 1025	15,10
10.50	121	184	0.20	1	101060 1050	14,30
11.00	128	197	0.20	1	101060 1100	14,85
11.50	128	197	0.20	1	101060 1150	16,45
12.00	134	205	0.20	1	101060 1200	18,70
12.50	134	205	0.20	1	101060 1250	18,70
13.00	134	205	0.20	1	101060 1300	19,50
13.50	140	214	0.20	1	101060 1350	24,50
14.00	140	214	0.20	1	101060 1400	24,30
14.50	144	220	0.20	1	101060 1450	34,30
15.00	144	220	0.20	1	101060 1500	30,20
15.50	149	227	0.20	1	101060 1550	36,10
16.00	149	227	0.25	1	101060 1600	36,20

1104



### ATORN® Twist drill bit

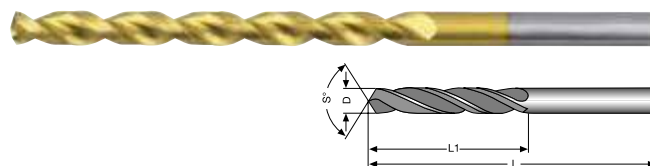
HSS
DIN 340
Typ TLP
130°
38°
h8
10xD
Z 2
TiN
i Vc/fz 369

- For deep bores (no chip removal)
- **Wide chip flutes for better chip removal**
- Point thinning from Ø > 1 mm
- Profile-ground to meet the highest demands for process reliability
- **Pilot hole recommended**

**Deep bore profile**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○				●	●				●	●	●	○			
		30	20	15				30	20				60	40	45	10			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
1.00	33	56	0.03	10	101061 0100	11,30
1.10	37	60	0.03	10	101061 0110	12,85
1.20	41	65	0.03	10	101061 0120	11,75
1.30	41	65	0.03	10	101061 0130	12,20
1.40	45	70	0.03	10	101061 0140	10,90
1.50	45	70	0.03	10	101061 0150	9,45
1.60	50	76	0.03	10	101061 0160	8,95
1.70	50	76	0.03	10	101061 0170	8,95
1.80	53	80	0.03	10	101061 0180	8,95
1.90	53	80	0.03	10	101061 0190	8,55
2.00	56	85	0.03	10	101061 0200	8,35
2.10	56	85	0.03	10	101061 0210	9,45
2.20	59	90	0.04	10	101061 0220	9,65
2.30	59	90	0.04	10	101061 0230	9,65
2.40	62	95	0.04	10	101061 0240	10,05
2.50	62	95	0.04	10	101061 0250	8,55
2.60	62	95	0.04	10	101061 0260	10,05
2.70	66	100	0.04	10	101061 0270	10,25
2.80	66	100	0.04	10	101061 0280	10,25

1104

D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
2.90	66	100	0.04	10	101061 0290	10,25
3.00	66	100	0.04	10	101061 0300	8,55
3.10	69	106	0.04	10	101061 0310	11,75
3.20	69	106	0.04	10	101061 0320	9,85
3.30	69	106	0.05	10	101061 0330	11,30
3.40	73	112	0.05	10	101061 0340	12,20
3.50	73	112	0.05	10	101061 0350	10,25
3.60	73	112	0.05	10	101061 0360	13,45
3.70	73	112	0.06	10	101061 0370	12,40
3.80	78	119	0.06	10	101061 0380	12,85
3.90	78	119	0.06	10	101061 0390	13,05
4.00	78	119	0.06	10	101061 0400	11,10
4.10	78	119	0.06	10	101061 0410	13,90
4.20	78	119	0.07	10	101061 0420	12,85
4.30	82	126	0.07	10	101061 0430	13,45
4.40	82	126	0.07	10	101061 0440	13,90
4.50	82	126	0.07	10	101061 0450	13,05
4.70	82	126	0.08	10	101061 0470	14,30
4.80	87	132	0.08	10	101061 0480	14,75

1104

Continued on next page >>>

D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
4.90	87	132	0.08	10	101061 0490	14,30
5.00	87	132	0.08	10	101061 0500	13,70
5.10	87	132	0.09	10	101061 0510	15,60
5.20	87	132	0.09	10	101061 0520	16,90
5.30	87	132	0.09	10	101061 0530	17,70
5.40	91	139	0.09	10	101061 0540	17,70
5.50	91	139	0.1	10	101061 0550	16,20
5.60	91	139	0.1	10	101061 0560	17,70
5.70	91	139	0.1	10	101061 0570	18,35
5.80	91	139	0.1	10	101061 0580	20,80
5.90	91	139	0.1	10	101061 0590	18,35
6.00	91	139	0.11	1	101061 0600	16,90
6.10	97	148	0.11	1	101061 0610	23,90
6.20	97	148	0.11	1	101061 0620	23,30
6.30	97	148	0.11	1	101061 0630	23,90
6.40	97	148	0.12	1	101061 0640	23,90

1104

D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
6.50	97	148	0.12	1	101061 0650	18,65
6.60	97	148	0.12	1	101061 0660	25,-
6.70	97	148	0.12	1	101061 0670	25,-
6.80	102	156	0.12	1	101061 0680	28,40
7.00	102	156	0.13	1	101061 0700	25,-
7.50	102	156	0.14	1	101061 0750	26,90
8.00	109	165	0.15	1	101061 0800	31,70
8.50	109	165	0.15	1	101061 0850	32,90
9.00	115	175	0.16	1	101061 0900	29,90
9.50	115	175	0.16	1	101061 0950	46,10
10.00	121	184	0.16	1	101061 1000	36,80
10.20	121	184	0.16	1	101061 1020	43,60
10.50	121	184	0.16	1	101061 1050	59,50
11.00	128	197	0.16	1	101061 1100	49,60
11.50	128	197	0.16	1	101061 1150	82,40
12.00	134	205	0.16	1	101061 1200	61,10

1104

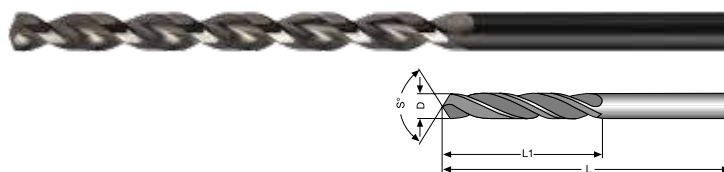
### ATORN® Twist drill bit



- Wide chip flutes
- Profile-ground, chamfers nitrided from a diameter of 2.4 mm
- High wear-resistance
- Recommended in cases of poor chip removal
- **Pilot hole recommended**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based			aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		40	20	10	12	10		30	25	6	6	6	70	50	45	10				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.




D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
1.00	33	56	0.03	10	101063 0100	6,40
1.10	37	60	0.03	10	101063 0110	7,40
1.20	41	65	0.03	10	101063 0120	6,65
1.30	41	65	0.03	10	101063 0130	6,80
1.40	45	70	0.03	10	101063 0140	6,20
1.50	45	70	0.03	10	101063 0150	5,25
1.60	50	76	0.03	10	101063 0160	5,-
1.70	50	76	0.03	10	101063 0170	4,96
1.80	53	80	0.03	10	101063 0180	4,89
1.90	53	80	0.03	10	101063 0190	4,85
2.00	56	85	0.03	10	101063 0200	4,56
2.10	56	85	0.03	10	101063 0210	5,25
2.20	59	90	0.04	10	101063 0220	5,30
2.30	59	90	0.04	10	101063 0230	5,40
2.40	62	95	0.04	10	101063 0240	5,60
2.50	62	95	0.04	10	101063 0250	4,73
2.60	62	95	0.04	10	101063 0260	5,60
2.70	66	100	0.04	10	101063 0270	5,65


1104

D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	☒	art.no.	€
2.80	66	100	0.04	10	101063 0280	5,65
2.90	66	100	0.04	10	101063 0290	5,75
3.00	66	100	0.04	10	101063 0300	4,72
3.10	69	106	0.04	10	101063 0310	6,70
3.20	69	106	0.04	10	101063 0320	5,50
3.30	69	106	0.05	10	101063 0330	6,50
3.40	73	112	0.05	10	101063 0340	6,80
3.50	73	112	0.05	10	101063 0350	5,65
3.60	73	112	0.05	10	101063 0360	7,50
3.70	73	112	0.06	10	101063 0370	7,-
3.80	78	119	0.06	10	101063 0380	7,20
3.90	78	119	0.06	10	101063 0390	7,30
4.00	78	119	0.06	10	101063 0400	6,30
4.10	78	119	0.06	10	101063 0410	7,60
4.20	78	119	0.07	10	101063 0420	7,20
4.30	82	126	0.07	10	101063 0430	8,05
4.40	82	126	0.07	10	101063 0440	12,20
4.50	82	126	0.07	10	101063 0450	7,30

1104

D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev		art.no.	€
4.60	82	126	0.08	10	101063 0460	9,90
4.70	82	126	0.08	10	101063 0470	8,35
4.80	87	132	0.08	10	101063 0480	8,25
4.90	87	132	0.08	10	101063 0490	7,90
5.00	87	132	0.08	10	101063 0500	7,65
5.10	87	132	0.09	10	101063 0510	7,90
5.20	87	132	0.09	10	101063 0520	9,50
5.30	87	132	0.09	10	101063 0530	9,90
5.40	91	139	0.09	10	101063 0540	12,60
5.50	91	139	0.1	10	101063 0550	9,20
5.60	91	139	0.1	10	101063 0560	10,15
5.70	91	139	0.1	10	101063 0570	10,15
5.80	91	139	0.1	10	101063 0580	11,65
5.90	91	139	0.1	10	101063 0590	10,40
6.00	91	139	0.11	10	101063 0600	9,50
6.10	97	148	0.11	1	101063 0610	13,40
6.20	97	148	0.11	1	101063 0620	13,10
6.30	97	148	0.11	1	101063 0630	15,85
6.40	97	148	0.12	1	101063 0640	14,25
6.50	97	148	0.12	1	101063 0650	10,40
6.60	97	148	0.12	1	101063 0660	13,80
6.70	97	148	0.12	1	101063 0670	16,05
6.80	102	156	0.12	1	101063 0680	15,75
6.90	102	156	0.13	1	101063 0690	16,25
7.00	102	156	0.13	1	101063 0700	12,25
7.10	102	156	0.13	1	101063 0710	16,95
7.20	102	156	0.13	1	101063 0720	16,65
7.30	102	156	0.14	1	101063 0730	15,65
7.40	102	156	0.14	1	101063 0740	21,-

1104

D mm	L1 mm	L mm	Feed f steel < 700 N/mm <sup>2</sup> mm/rev		art.no.	€
7.50	102	156	0.14	1	101063 0750	14,95
7.60	109	165	0.14	1	101063 0760	22,-
7.70	109	165	0.14	1	101063 0770	21,-
7.80	109	165	0.15	1	101063 0780	18,45
7.90	109	165	0.15	1	101063 0790	23,10
8.00	109	165	0.15	1	101063 0800	14,-
8.10	109	165	0.15	1	101063 0810	21,20
8.20	109	165	0.15	1	101063 0820	19,05
8.30	109	165	0.15	1	101063 0830	23,60
8.40	109	165	0.15	1	101063 0840	22,-
8.50	109	165	0.15	1	101063 0850	18,45
9.00	115	175	0.16	1	101063 0900	16,65
9.50	115	175	0.16	1	101063 0950	26,-
9.80	121	184	0.16	1	101063 0980	34,80
10.00	121	184	0.16	1	101063 1000	20,50
10.20	121	184	0.16	1	101063 1020	29,30
10.50	121	184	0.16	1	101063 1050	39,80
11.00	128	197	0.16	1	101063 1100	33,20
11.50	128	197	0.16	1	101063 1150	55,10
12.00	134	205	0.16	1	101063 1200	40,60
12.50	134	205	0.18	1	101063 1250	42,20
13.00	134	205	0.18	1	101063 1300	43,70
13.50	140	214	0.18	1	101063 1350	44,40
14.00	140	214	0.19	1	101063 1400	45,70
14.50	144	220	0.19	1	101063 1450	58,-
15.00	144	220	0.19	1	101063 1500	59,10
15.50	149	227	0.2	1	101063 1550	78,70
16.00	149	227	0.2	1	101063 1600	83,20

1104



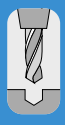


# ATORN® Twist drill bit

HSS-E
DIN 340
Typ VA
130°
35°
h8
10xD
Z 2
Vc/tz 369

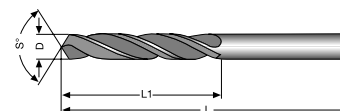
**Stainless steel**

- For deep bores (multiple chip removal)
- Point thinning from  $\varnothing \geq 1$  mm
- Increased wear-resistance with special geometry for machining stainless steel
- Pilot hole recommended



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	super alloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		30	20	10	15	10				7	6	6	70	50	45				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	Feed f stainless steel mm/rev	☒	art.no.	€
1.00	33	56	0.03	10	101062 0100	8,55
1.10	37	60	0.03	10	101062 0110	9,45
1.20	41	65	0.03	10	101062 0120	9,45
1.30	41	65	0.03	10	101062 0130	9,45
1.40	45	70	0.03	10	101062 0140	9,45
1.50	45	70	0.03	10	101062 0150	8,55
1.60	50	76	0.03	10	101062 0160	9,55
1.70	50	76	0.03	10	101062 0170	9,55
1.80	53	80	0.03	10	101062 0180	9,55
1.90	53	80	0.03	10	101062 0190	9,55
2.00	56	85	0.03	10	101062 0200	7,85
2.10	56	85	0.03	10	101062 0210	8,70
2.20	59	90	0.04	10	101062 0220	8,70
2.30	59	90	0.04	10	101062 0230	8,70
2.40	62	95	0.04	10	101062 0240	8,70
2.50	62	95	0.04	10	101062 0250	8,-
2.60	62	95	0.04	10	101062 0260	8,70
2.70	66	100	0.04	10	101062 0270	8,70
2.80	66	100	0.04	10	101062 0280	9,35
2.90	66	100	0.04	10	101062 0290	9,35
3.00	66	100	0.04	10	101062 0300	8,-
3.10	69	106	0.04	10	101062 0310	9,35
3.20	69	106	0.04	10	101062 0320	9,35
3.30	69	106	0.04	10	101062 0330	9,35
3.40	73	112	0.05	10	101062 0340	9,35
3.50	73	112	0.05	10	101062 0350	9,05
3.60	73	112	0.05	10	101062 0360	9,55
3.70	73	112	0.05	10	101062 0370	9,55
3.80	78	119	0.05	10	101062 0380	9,55
3.90	78	119	0.05	10	101062 0390	9,55
4.00	78	119	0.05	10	101062 0400	9,45
4.10	78	119	0.05	10	101062 0410	10,10
4.20	78	119	0.05	10	101062 0420	10,10
4.30	82	126	0.06	10	101062 0430	11,25
4.40	82	126	0.06	10	101062 0440	11,25
4.50	82	126	0.06	10	101062 0450	10,90
4.70	82	126	0.06	10	101062 0470	11,80
4.80	87	132	0.06	10	101062 0480	11,80

1104

D mm	L1 mm	L mm	Feed f stainless steel mm/rev	☒	art.no.	€
4.90	87	132	0.06	10	101062 0490	11,80
5.00	87	132	0.06	10	101062 0500	11,-
5.10	87	132	0.07	10	101062 0510	12,20
5.20	87	132	0.07	10	101062 0520	12,20
5.30	87	132	0.07	10	101062 0530	12,20
5.40	91	139	0.07	10	101062 0540	12,20
5.50	91	139	0.07	10	101062 0550	12,15
5.60	91	139	0.07	10	101062 0560	13,60
5.70	91	139	0.07	10	101062 0570	13,60
5.80	91	139	0.07	10	101062 0580	13,60
5.90	91	139	0.08	10	101062 0590	13,35
6.00	91	139	0.08	10	101062 0600	12,75
6.10	97	148	0.08	1	101062 0610	14,50
6.20	97	148	0.08	1	101062 0620	14,50
6.30	97	148	0.08	1	101062 0630	14,50
6.40	97	148	0.08	1	101062 0640	14,50
6.50	97	148	0.08	1	101062 0650	13,20
6.60	97	148	0.08	1	101062 0660	15,20
6.70	97	148	0.08	1	101062 0670	15,20
6.80	102	156	0.09	1	101062 0680	17,25
7.00	102	156	0.09	1	101062 0700	15,65
7.50	102	156	0.09	1	101062 0750	13,15
7.70	109	165	0.1	1	101062 0770	15,50
7.80	109	165	0.1	1	101062 0780	15,50
8.00	109	165	0.1	1	101062 0800	15,10
8.10	109	165	0.1	1	101062 0810	17,30
8.20	109	165	0.1	1	101062 0820	17,30
8.40	109	165	0.1	1	101062 0840	17,30
8.50	109	165	0.11	1	101062 0850	14,-
9.00	115	175	0.11	1	101062 0900	15,60
9.50	115	175	0.12	1	101062 0950	17,85
9.80	121	184	0.12	1	101062 0980	23,50
10.00	121	184	0.12	1	101062 1000	23,40
10.20	121	184	0.12	1	101062 1020	25,10
10.50	121	184	0.13	1	101062 1050	27,60
11.00	128	195	0.13	1	101062 1100	34,20
11.50	128	195	0.13	1	101062 1150	34,30
12.00	134	205	0.14	1	101062 1200	35,70

1104

# ATORN® Deep hole drill bit

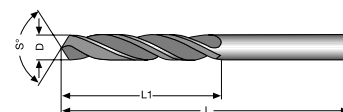
HSS
DIN 1869
Typ TLP
130°
38°
h8
>10xD
Z 2
i Vc/tz
370

- For extremely deep bores, 15xD to 25xD
- Flat slot shape for increased chip space, leading to less frequent chip removal in particularly deep holes
- Point thinning from Ø ≥ 2 mm
- Slots bare
- Nitrided chamfers from Ø 2.5 mm
- Pilot hole recommended

**Deep bore profile**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si			<55 HRc	<60 HRc	≥60 HRc
		●	○	○				●	●				●	●	●				
		25	10	10				20	20				50	40	45				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
2.00	85	125	0.05	101070 0036	13,65
2.50	95	140	0.05	101070 0037	13,65
3.00	100	150	0.06	101070 0001	14,95
3.00	130	190	0.06	101070 0002	19,90
3.50	115	165	0.07	101070 0003	14,95
3.50	145	210	0.07	101070 0004	20,20
4.00	120	175	0.09	101070 0005	15,35
4.00	150	220	0.09	101070 0006	21,60
4.00	190	280	0.09	101070 0007	27,40
4.50	125	185	0.1	101070 0008	16,60
4.50	160	235	0.10	101070 0009	22,80
5.00	135	195	0.12	101070 0010	17,40
5.00	170	245	0.12	101070 0011	22,80
5.00	210	315	0.12	101070 0012	33,-
5.50	140	205	0.13	101070 0013	19,15
5.50	180	260	0.13	101070 0014	28,50
6.00	140	205	0.14	101070 0015	19,15
6.00	180	260	0.14	101070 0016	27,70

1104

D mm	L1 mm	L mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
6.00	225	330	0.14	101070 0017	37,90
6.50	150	215	0.16	101070 0039	25,90
6.50	190	275	0.16	101070 0018	32,-
6.80	155	225	0.16	101070 0019	33,70
7.00	155	225	0.17	101070 0020	27,40
7.00	200	290	0.17	101070 0021	34,80
7.50	155	225	0.17	101070 0022	30,90
7.50	200	290	0.17	101070 0023	40,90
8.00	165	240	0.2	101070 0024	33,70
8.00	210	305	0.2	101070 0025	40,70
8.00	265	390	0.2	101070 0026	60,70
8.50	165	240	0.21	101070 0027	43,70
8.50	210	305	0.21	101070 0028	63,10
9.00	175	250	0.21	101070 0029	46,40
9.00	220	320	0.21	101070 0030	61,90
10.00	185	265	0.22	101070 0032	48,30
10.00	235	340	0.22	101070 0033	66,-
10.00	295	430	0.22	101070 0034	96,20

1104

## Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com

# TDXL high-performance deep hole drill

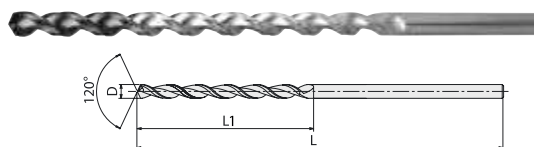
HSS-E
Werk-norm
Typ TLP
120°
40°
10xD
15xD
20xD
TiAlN
*i* Vc/tz 370

- Flat flute for increased chip space, drilling without chip removal
- Bore depths of 10xD, 15xD and 20xD
- New chip flute structure for enhanced chip removal, polished wave-shaped flute
- Newly developed point thinning for lower torque, axial force and friction
- New heat and wear-resistant WXL coating with a very low friction coefficient
- **Cutting material: HSS-E, WXL-coated**
- Shank tolerance h7
- Use with water-soluble emulsion recommended
- **Without internal cooling**
- **Pilot hole recommended**

**Drilling without chip removal**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 20-24	● 18-22	● 12-16				● 18-24	● 16-20											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



## 10xD

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1.6	75	26	0.02	101099 0016	23,80
1.8	75	26	0.03	101099 0018	23,80
2.0	75	26	0.03	101099 0020	22,10
2.1	75	33	0.03	101099 0021	26,-
2.2	75	33	0.03	101099 0022	26,-
2.3	75	33	0.03	101099 0023	26,-
2.4	75	33	0.04	101099 0024	26,-
2.5	75	33	0.04	101099 0025	24,80
2.6	90	40	0.04	101099 0026	26,-
2.7	90	40	0.04	101099 0027	29,80
2.8	90	40	0.04	101099 0028	29,80
2.9	90	40	0.04	101099 0029	29,80
3.0	90	40	0.05	101099 0030	28,70
3.1	100	45	0.05	101099 0031	33,70
3.2	100	45	0.05	101099 0032	33,70
3.3	100	45	0.05	101099 0033	33,70
3.4	100	50	0.05	101099 0034	38,80
3.5	100	50	0.05	101099 0035	32,10
3.6	100	50	0.05	101099 0036	33,70
3.7	100	50	0.06	101099 0037	33,70
3.8	100	50	0.06	101099 0038	37,90
3.9	100	50	0.06	101099 0039	37,90
4.0	100	50	0.06	101099 0040	36,10
4.1	115	55	0.06	101099 0041	37,90
4.2	115	55	0.06	101099 0042	37,90
4.3	115	60	0.06	101099 0043	42,90
4.4	115	60	0.07	101099 0044	42,90
4.5	115	60	0.07	101099 0045	40,90
4.6	115	60	0.07	101099 0046	42,90
4.7	115	60	0.07	101099 0047	48,90
4.8	115	65	0.07	101099 0048	48,90
4.9	115	65	0.07	101099 0049	50,10
5.0	115	65	0.08	101099 0050	45,70
5.1	128	70	0.08	101099 0051	48,90
5.2	128	70	0.08	101099 0052	48,90
5.3	128	70	0.08	101099 0053	48,90
5.4	128	78	0.08	101099 0054	65,30

1107

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
5.5	128	78	0.08	101099 0055	52,20
5.6	128	78	0.08	101099 0056	69,50
5.7	128	78	0.09	101099 0057	69,50
5.8	128	78	0.09	101099 0058	69,50
5.9	128	78	0.09	101099 0059	69,50
6.0	128	78	0.09	101099 0060	58,80
6.1	140	78	0.09	101099 0061	95,70
6.2	140	87	0.09	101099 0062	79,10
6.3	140	87	0.09	101099 0063	95,70
6.4	140	87	0.10	101099 0064	95,70
6.5	140	87	0.10	101099 0065	66,20
6.6	140	87	0.10	101099 0066	79,10
6.7	140	87	0.10	101099 0067	79,10
6.8	140	90	0.10	101099 0068	79,10
6.9	140	90	0.10	101099 0069	79,10
7.0	140	90	0.11	101099 0070	75,10
7.1	155	100	0.11	101099 0071	101,90
7.2	155	100	0.11	101099 0072	101,90
7.3	155	100	0.11	101099 0073	101,90
7.4	155	100	0.11	101099 0074	101,90
7.5	155	100	0.11	101099 0075	84,70
7.6	155	105	0.11	101099 0076	115,60
7.7	155	105	0.12	101099 0077	115,60
7.8	155	105	0.12	101099 0078	115,60
7.9	155	105	0.12	101099 0079	115,60
8.0	155	105	0.12	101099 0080	96,50
8.1	165	110	0.12	101099 0081	125,-
8.2	165	110	0.12	101099 0082	125,-
8.3	165	110	0.12	101099 0083	125,-
8.4	165	110	0.13	101099 0084	125,-
8.5	165	110	0.13	101099 0085	108,60
8.6	165	115	0.13	101099 0086	147,80
8.7	165	115	0.13	101099 0087	147,80
8.8	165	115	0.13	101099 0088	147,80
8.9	165	115	0.13	101099 0089	147,80
9.0	165	115	0.14	101099 0090	123,30
9.1	190	125	0.14	101099 0091	160,30

1107

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
9.2	190	125	0.14	101099 0092	160,30
9.3	190	125	0.14	101099 0093	160,30
9.4	190	125	0.14	101099 0094	160,30
9.5	190	125	0.14	101099 0095	139,50
9.6	190	130	0.14	101099 0096	175,70
9.7	190	130	0.15	101099 0097	175,70
9.8	190	130	0.15	101099 0098	175,70
9.9	190	130	0.15	101099 0099	175,70
10.0	190	130	0.15	101099 0100	157,-
10.1	205	140	0.15	101099 0101	196,50
10.2	205	140	0.15	101099 0102	196,50
10.3	205	140	0.15	101099 0103	196,50
10.4	205	140	0.16	101099 0104	196,50
10.5	205	140	0.16	101099 0105	178,40
10.6	205	145	0.16	101099 0106	219,-

1107

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
10.7	205	145	0.16	101099 0107	219,-
10.8	205	145	0.16	101099 0108	219,-
10.9	205	145	0.16	101099 0109	219,-
11.0	205	145	0.17	101099 0110	202,50
11.1	215	155	0.17	101099 0111	224,30
11.2	215	155	0.17	101099 0112	224,30
11.3	215	155	0.17	101099 0113	224,30
11.4	215	155	0.17	101099 0114	224,30
11.5	215	155	0.17	101099 0115	213,70
11.6	215	155	0.17	101099 0116	227,70
11.7	215	155	0.18	101099 0117	227,70
11.8	215	155	0.18	101099 0118	227,70
11.9	215	155	0.18	101099 0119	227,70
12.0	215	155	0.18	101099 0120	224,50

1107

## 15xD

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1.6	70	30	0.02	101100 0016	28,-
1.8	75	34	0.03	101100 0018	28,-
2	80	36	0.03	101100 0020	26,-
2.1	80	38	0.03	101100 0021	30,70
2.2	80	40	0.03	101100 0022	30,70
2.3	85	42	0.03	101100 0023	30,70
2.4	85	44	0.04	101100 0024	30,70
2.5	85	46	0.04	101100 0025	29,40
2.6	100	48	0.04	101100 0026	30,70
2.7	100	50	0.04	101100 0027	35,30
2.8	100	50	0.04	101100 0028	35,30
2.9	105	54	0.04	101100 0029	35,30
3	105	54	0.05	101100 0030	33,60
3.1	110	56	0.05	101100 0031	39,40
3.2	110	58	0.05	101100 0032	39,40
3.3	110	60	0.05	101100 0033	39,40
3.4	115	62	0.05	101100 0034	45,80
3.5	115	64	0.05	101100 0035	37,80
3.6	115	66	0.05	101100 0036	39,40
3.7	120	68	0.06	101100 0037	39,40
3.8	120	70	0.06	101100 0038	44,60
3.9	120	70	0.06	101100 0039	44,60
4	120	72	0.06	101100 0040	42,60
4.1	135	74	0.06	101100 0041	44,60
4.2	135	76	0.06	101100 0042	44,60
4.3	140	78	0.06	101100 0043	50,40
4.4	140	80	0.07	101100 0044	50,40
4.5	140	82	0.07	101100 0045	48,-
4.6	145	84	0.07	101100 0046	50,40
4.7	145	86	0.07	101100 0047	57,40
4.8	145	86	0.07	101100 0048	57,40
4.9	150	88	0.07	101100 0049	58,70
5	150	90	0.08	101100 0050	53,60
5.1	150	92	0.08	101100 0051	57,40

1107

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
5.2	155	94	0.08	101100 0052	57,40
5.3	155	96	0.08	101100 0053	57,40
5.4	155	98	0.08	101100 0054	76,70
5.5	155	100	0.08	101100 0055	61,20
5.6	160	102	0.08	101100 0056	81,90
5.7	165	104	0.09	101100 0057	81,90
5.8	165	106	0.09	101100 0058	81,90
6	170	108	0.09	101100 0060	69,20
6.2	170	112	0.09	101100 0062	92,80
6.3	175	114	0.09	101100 0063	112,30
6.5	200	118	0.10	101100 0065	78,30
6.6	200	120	0.10	101100 0066	92,80
6.8	200	124	0.10	101100 0068	92,80
6.9	200	126	0.10	101100 0069	92,80
7	200	126	0.11	101100 0070	88,30
7.1	200	128	0.11	101100 0071	142,70
7.5	205	136	0.11	101100 0075	99,80
8	215	144	0.12	101100 0080	113,20
8.1	215	146	0.12	101100 0081	143,40
8.2	220	148	0.12	101100 0082	143,40
8.5	225	154	0.13	101100 0085	127,90
8.6	225	156	0.13	101100 0086	225,80
8.8	230	160	0.13	101100 0088	225,80
9	230	162	0.14	101100 0090	145,10
9.3	240	168	0.14	101100 0093	207,80
9.5	240	172	0.14	101100 0095	164,30
9.7	245	176	0.15	101100 0097	258,90
9.8	245	178	0.15	101100 0098	228,-
10	250	180	0.15	101100 0100	184,70
10.5	270	190	0.16	101100 0105	209,70
11	280	200	0.17	101100 0110	238,20
11.5	290	208	0.17	101100 0115	266,40
11.8	295	214	0.18	101100 0118	369,-
12	300	216	0.18	101100 0120	284,50

1107

Continued on next page &gt;&gt;&gt;

## 20XD

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1.6	85	38	0.02	101101 0016	33,-
1.8	85	42	0.03	101101 0018	33,-
2	85	46	0.03	101101 0020	31,30
2.1	90	50	0.03	101101 0021	38,30
2.2	90	52	0.03	101101 0022	38,30
2.3	95	54	0.03	101101 0023	38,30
2.4	95	56	0.04	101101 0024	38,30
2.5	100	58	0.04	101101 0025	36,-
2.6	110	60	0.04	101101 0026	38,30
2.7	115	64	0.04	101101 0027	43,50
2.8	115	66	0.04	101101 0028	43,50
2.9	120	68	0.04	101101 0029	43,50
3	120	70	0.05	101101 0030	41,10
3.1	125	72	0.05	101101 0031	48,70
3.2	125	74	0.05	101101 0032	48,70
3.3	125	76	0.05	101101 0033	48,70
3.4	130	80	0.05	101101 0034	56,-
3.5	130	82	0.05	101101 0035	45,80
3.7	135	86	0.06	101101 0037	49,10
3.8	140	88	0.06	101101 0038	55,30
4	140	92	0.06	101101 0040	52,60
4.1	155	96	0.06	101101 0041	66,60
4.2	155	98	0.06	101101 0042	55,30
4.3	160	100	0.06	101101 0043	62,50

1107

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
4.5	165	104	0.07	101101 0045	59,50
4.6	165	106	0.07	101101 0046	71,90
4.8	170	112	0.07	101101 0048	71,90
5	175	116	0.08	101101 0050	68,10
5.1	180	118	0.08	101101 0051	72,40
5.2	180	120	0.08	101101 0052	72,40
5.5	185	128	0.08	101101 0055	76,70
5.7	190	132	0.09	101101 0057	101,50
5.8	200	134	0.09	101101 0058	101,50
6	200	138	0.09	101101 0060	87,50
6.3	200	146	0.09	101101 0063	142,30
6.5	225	150	0.10	101101 0065	99,10
6.8	225	158	0.10	101101 0068	118,40
6.9	230	160	0.10	101101 0069	118,40
7	230	162	0.11	101101 0070	112,60
7.5	245	174	0.11	101101 0075	127,90
8	255	184	0.12	101101 0080	145,60
8.1	255	188	0.12	101101 0081	180,90
8.2	260	190	0.12	101101 0082	180,90
8.5	265	196	0.13	101101 0085	166,30
9	275	208	0.14	101101 0090	187,90
10	300	230	0.15	101101 0100	243,50
11	350	254	0.17	101101 0110	315,-
12	350	276	0.18	101101 0120	396,80

1107

TOOL  
**WORN-OUT.**  
THAT WON'T  
**STOP YOU**

**BECAUSE YOU ARE ALWAYS PREPARED:  
SARA®GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

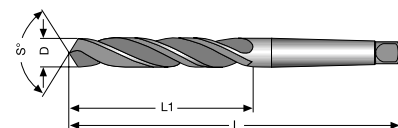
# ATORN® Twist drill with MT shank

HSS
DIN 345
Typ N
118°
30°
h8
5xD
Z 2
Vap.
Vc/fz 366

- Point thinning from Ø 14.25 mm
- MT shank
- Vapour-treated, resulting in lower welding tendency and better chip removal

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		30	20		10			25	25			45	50	40	10				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	Shank	Feed f steel < 700 N/mm² mm/rev	art.no.	€
5.00	52	133	MT 1	0.11	101505 0050	19,65
6.00	57	138	MT 1	0.12	101505 0060	20,20
6.80	69	150	MT 1	0.13	101505 0068	31,90
7.00	69	150	MT 1	0.12	101505 0070	19,65
8.00	75	156	MT 1	0.12	101505 0080	18,95
8.50	75	156	MT 1	0.13	101505 0085	21,40
9.00	81	162	MT 1	0.13	101505 0090	20,90
9.50	81	162	MT 1	0.14	101505 0095	23,30
10.00	87	168	MT 1	0.22	101505 0100	21,20
10.20	87	168	MT 1	0.22	101505 0102	31,30
10.50	87	168	MT 1	0.23	101505 0105	21,90
11.00	94	175	MT 1	0.23	101505 0110	22,90
11.50	94	175	MT 1	0.24	101505 0115	26,60
11.75	94	175	MT 1	0.24	101505 0117	30,60
11.80	94	175	MT 1	0.24	101505 0118	31,40
12.00	101	182	MT 1	0.24	101505 0120	23,60
12.10	101	182	MT 1	0.24	101505 0121	30,50
12.20	101	182	MT 1	0.24	101505 0122	31,10
12.50	101	182	MT 1	0.25	101505 0125	24,80
12.75	101	182	MT 1	0.25	101505 0127	31,-
13.00	101	182	MT 1	0.25	101505 0130	26,-
13.50	108	189	MT 1	0.26	101505 0135	29,20
13.75	108	189	MT 1	0.26	101505 0137	33,30
14.00	108	189	MT 1	0.26	101505 0140	27,30
14.25	114	212	MT 2	0.26	101505 0142	41,10
14.50	114	212	MT 2	0.27	101505 0145	28,40
14.75	114	212	MT 2	0.27	101505 0147	43,40
15.00	114	212	MT 2	0.27	101505 0150	30,60
15.25	120	218	MT 2	0.27	101505 0152	40,40
15.50	120	218	MT 2	0.28	101505 0155	32,60
15.75	120	218	MT 2	0.28	101505 0157	36,90
16.00	120	218	MT 2	0.28	101505 0160	32,60
16.25	125	223	MT 2	0.28	101505 0163	49,30
16.50	125	223	MT 2	0.28	101505 0165	35,20
16.75	125	223	MT 2	0.29	101505 0167	40,40
17.00	125	223	MT 2	0.29	101505 0170	36,70
17.25	130	228	MT 2	0.29	101505 0172	45,80
17.50	130	228	MT 2	0.29	101505 0175	37,50
17.75	130	228	MT 2	0.29	101505 0177	46,-
18.00	130	228	MT 2	0.3	101505 0180	39,20

1104

D mm	L1 mm	L mm	Shank	Feed f steel < 700 N/mm² mm/rev	art.no.	€
18.50	135	233	MT 2	0.3	101505 0185	42,40
18.75	135	233	MT 2	0.3	101505 0187	49,30
19.00	135	233	MT 2	0.3	101505 0190	42,20
19.50	140	238	MT 2	0.31	101505 0195	48,90
19.75	140	238	MT 2	0.31	101505 0197	54,90
20.00	140	238	MT 2	0.31	101505 0200	44,90
20.50	145	243	MT 2	0.32	101505 0205	47,20
21.00	145	243	MT 2	0.32	101505 0210	50,20
21.50	150	248	MT 2	0.32	101505 0215	58,-
21.75	150	248	MT 2	0.33	101505 0217	65,50
22.00	150	248	MT 2	0.33	101505 0220	55,90
22.50	155	253	MT 2	0.33	101505 0225	61,10
23.00	155	253	MT 2	0.33	101505 0230	66,-
23.50	155	276	MT 3	0.34	101505 0235	65,50
24.00	160	281	MT 3	0.34	101505 0240	69,10
24.50	160	281	MT 3	0.35	101505 0245	72,-
24.75	160	281	MT 3	0.35	101505 0247	98,90
25.00	160	281	MT 3	0.35	101505 0250	76,-
25.50	165	286	MT 3	0.35	101505 0255	78,80
26.00	165	286	MT 3	0.35	101505 0260	87,10
26.50	165	286	MT 3	0.36	101505 0265	84,10
27.00	170	291	MT 3	0.36	101505 0270	86,50
27.50	170	291	MT 3	0.36	101505 0275	89,90
28.00	170	291	MT 3	0.36	101505 0280	96,-
28.50	175	296	MT 3	0.37	101505 0285	118,50
29.00	175	296	MT 3	0.37	101505 0290	105,-
29.50	175	296	MT 3	0.37	101505 0295	107,-
30.00	175	296	MT 3	0.37	101505 0300	105,-
30.50	180	301	MT 3	0.37	101505 0305	127,50
30.75	180	301	MT 3	0.37	101505 0307	143,-
31.00	180	301	MT 3	0.38	101505 0310	123,50
31.50	180	301	MT 3	0.28	101505 0315	141,-
32.00	185	334	MT 4	0.38	101505 0320	131,50
32.50	185	334	MT 4	0.38	101505 0325	150,50
33.00	185	334	MT 4	0.38	101505 0330	140,50
33.50	185	334	MT 4	0.28	101505 0335	156,-
34.00	190	339	MT 4	0.39	101505 0340	164,50
34.50	190	339	MT 4	0.28	101505 0345	182,-
35.00	190	339	MT 4	0.39	101505 0350	166,-
35.50	190	339	MT 4	0.28	101505 0355	199,50

1104

Continued on next page >>>



D mm	L1 mm	L mm	Shank	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	art.no.	€
36.00	195	344	MT 4	0.28	101505 0360	181,-
36.50	195	344	MT 4	0.28	101505 0365	203,-
37.00	195	344	MT 4	0.28	101505 0370	196,50
38.00	200	349	MT 4	0.41	101505 0380	210,-
38.50	200	349	MT 4	0.28	101505 0385	256,-
39.00	200	349	MT 4	0.28	101505 0390	232,-
39.50	200	349	MT 4	0.28	101505 0395	287,-
40.00	200	349	MT 4	0.41	101505 0400	236,-
40.50	205	354	MT 4	0.28	101505 0405	380,-
41.00	205	354	MT 4	0.28	101505 0410	253,-

1104

D mm	L1 mm	L mm	Shank	Feed f steel < 700 N/mm <sup>2</sup> mm/rev	art.no.	€
41.50	205	354	MT 4	0.28	101505 0415	440,-
42.00	205	354	MT 4	0.28	101505 0420	278,-
42.50	205	354	MT 4	0.28	101505 0425	236,-
43.00	210	359	MT 4	0.28	101505 0430	294,-
44.00	210	359	MT 4	0.28	101505 0440	311,-
45.00	210	359	MT 4	0.44	101505 0450	323,-
46.00	215	364	MT 4	0.28	101505 0460	334,-
48.00	220	369	MT 4	0.28	101505 0480	370,-
50.00	220	369	MT 4	0.46	101505 0500	395,-

1104

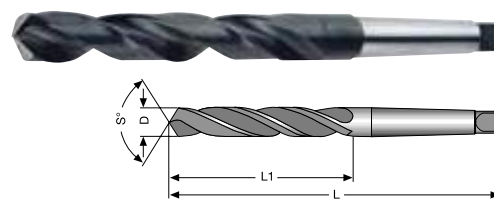
### ATORN® Twist drill with MT shank

HSS-E
DIN 345
Typ N
118°
30°
h8
5xD
Z 2
Vap.
i Vc/tz
370

- Point thinning from Ø 12.0 mm
- Morse taper shank
- **Vapour-treated for reduced welding tendencies and better chip removal**
- Higher wear resistance

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	ERP/EPF/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		30	25	15	15	12		35	30			60	50	45				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	L mm	L1 mm	Shank	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
12.00	182	101	MT 1	0.28	101507 0120	45,20
12.50	182	101	MT 1	0.31	101507 0125	46,80
13.00	182	101	MT 1	0.31	101507 0130	49,20
13.50	189	108	MT 1	0.31	101507 0135	60,10
14.00	189	108	MT 1	0.31	101507 0140	53,40
14.50	212	114	MT 2	0.31	101507 0145	59,50
15.00	212	114	MT 2	0.31	101507 0150	62,10
15.50	218	120	MT 2	0.31	101507 0155	62,60
15.75	218	120	MT 2	0.31	101507 0157	71,70
16.00	218	120	MT 2	0.31	101507 0160	65,10
16.50	223	125	MT 2	0.35	101507 0165	68,20
17.00	223	125	MT 2	0.35	101507 0170	68,20
17.50	228	130	MT 2	0.35	101507 0175	66,20
18.00	228	130	MT 2	0.35	101507 0180	71,20
18.50	233	135	MT 2	0.35	101507 0185	75,80
19.00	233	135	MT 2	0.35	101507 0190	75,30
19.50	238	140	MT 2	0.35	101507 0195	90,60
20.00	238	140	MT 2	0.35	101507 0200	80,90
20.50	243	145	MT 2	0.35	101507 0205	87,50
21.00	243	145	MT 2	0.35	101507 0210	95,60
21.50	248	150	MT 2	0.35	101507 0215	125,50
22.00	248	150	MT 2	0.35	101507 0220	110,-
22.50	253	155	MT 2	0.35	101507 0225	172,-
23.00	253	155	MT 2	0.35	101507 0230	124,50

1104

D h8 mm	L mm	L1 mm	Shank	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
23.50	276	155	MT3	0.35	101507 0235	135,50
24.00	281	160	MT3	0.35	101507 0240	144,50
24.50	281	160	MT3	0.35	101507 0245	153,-
25.00	281	160	MT3	0.35	101507 0250	144,50
25.50	286	165	MT3	0.35	101507 0255	186,50
26.00	286	165	MT3	0.35	101507 0260	170,-
26.50	286	165	MT3	0.35	101507 0265	199,50
27.00	291	170	MT3	0.35	101507 0270	187,50
27.50	291	170	MT3	0.35	101507 0275	209,-
28.00	291	170	MT3	0.35	101507 0280	214,-
28.50	296	175	MT3	0.35	101507 0285	239,-
29.00	296	175	MT3	0.35	101507 0290	219,-
29.50	296	175	MT3	0.35	101507 0295	219,-
30.00	296	175	MT3	0.35	101507 0300	204,-
30.50	301	180	MT3	0.35	101507 0305	341,-
31.00	301	180	MT3	0.35	101507 0310	285,-
31.50	301	180	MT3	0.35	101507 0315	331,-
32.00	334	185	MT 4	0.35	101507 0320	295,-
32.50	334	185	MT 4	0.35	101507 0325	495,-
33.00	334	185	MT 4	0.35	101507 0330	301,-
33.50	334	185	MT 4	0.35	101507 0335	499,-
34.00	339	190	MT 4	0.35	101507 0340	316,-
35.00	339	190	MT 4	0.35	101507 0350	331,-

1104

**ATORN® Twist drill with MT shank**

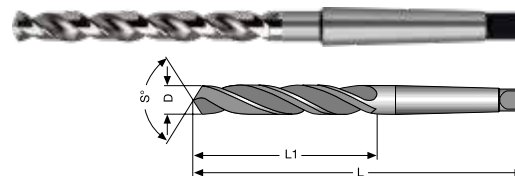
HSS-E
DIN 345
Typ VA
130°
40°
h8
5xD
Z 2
Vc/tz 366

**Stainless steel**

- Profile-ground
- Morse taper shank
- **For machining stainless steel**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		30	20	10	12	10	6			7	6	70	50	40				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	L mm	L1 mm	Shank	Feed f stainless steel austenitic mm/rev	art.no.	€
12.5	182	101	MT 1	0.18	101605 0125	47,70
13.0	182	101	MT 1	0.18	101605 0130	50,10
13.5	189	108	MT 1	0.19	101605 0135	61,50
14.0	189	108	MT 1	0.19	101605 0140	54,50
14.5	212	114	MT 2	0.20	101605 0145	61,10
15.0	212	114	MT 2	0.20	101605 0150	64,30
15.5	218	120	MT 2	0.21	101605 0155	64,50
16.0	218	120	MT 2	0.21	101605 0160	66,60
16.5	223	125	MT 2	0.21	101605 0165	68,90
17.0	223	125	MT 2	0.22	101605 0170	68,90
17.5	228	130	MT 2	0.22	101605 0175	67,10

1104

D h8 mm	L mm	L1 mm	Shank	Feed f stainless steel austenitic mm/rev	art.no.	€
18.0	228	130	MT 2	0.23	101605 0180	72,-
18.5	233	135	MT 2	0.23	101605 0185	77,30
19.0	233	135	MT 2	0.23	101605 0190	76,40
19.5	238	140	MT 2	0.24	101605 0195	91,90
20.0	238	140	MT 2	0.24	101605 0200	82,-
20.5	243	145	MT 2	0.25	101605 0205	89,90
21.0	243	145	MT 2	0.25	101605 0210	97,70
21.5	248	150	MT 2	0.25	101605 0215	129,50
22.0	248	150	MT 2	0.26	101605 0220	113,50
22.5	253	155	MT 2	0.26	101605 0225	141,50
23.0	253	155	MT 2	0.26	101605 0230	129,-

1104

**RIGHT ACROSS EUROPE.**  
**WE MANAGE THAT FOR YOU**  
**WITHIN 24 HOURS:**  
**24-HOUR DELIVERY**  
**THROUGHOUT EUROPE**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE

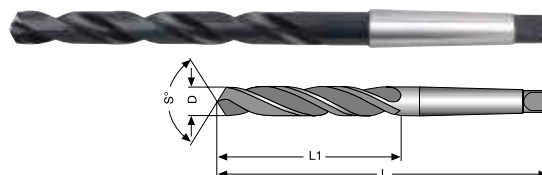
## ATORN® Twist drill bit (drilling bush), with MT shank

HSS
DIN 341
Typ N
118°
30°
h8
10xD
Z 2
Vap.
Vc/fz 371

- Special geometry
- **For drilling through drill guide bushes**
- In comparison to DIN 345, the spiral length is extended by the height of the drill guide bush so that the effective drilling depth is not reduced
- Morse taper shank
- **Vapour-treated**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●					○	○				○	○	○					
		25	20					25	20				50	40	45					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	L mm	L1 mm	Shank	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
10.0	197	116	MT 1	0.23	101601 0100	30,30
10.2	197	116	MT 1	0.23	101601 0102	36,30
10.5	197	116	MT 1	0.23	101601 0105	30,80
11.0	206	125	MT 1	0.23	101601 0110	31,90
11.5	206	125	MT 1	0.23	101601 0115	31,90
12.0	215	134	MT 1	0.23	101601 0120	31,90
12.5	215	134	MT 1	0.23	101601 0125	32,40
13.0	215	134	MT 1	0.23	101601 0130	32,40
13.5	223	142	MT 1	0.23	101601 0135	35,80
14.0	223	142	MT 1	0.23	101601 0140	36,40
14.5	245	147	MT 2	0.23	101601 0145	45,60
15.0	245	147	MT 2	0.23	101601 0150	45,50
15.5	251	153	MT 2	0.23	101601 0155	45,50
16.0	251	153	MT 2	0.23	101601 0160	47,20
16.5	257	159	MT 2	0.35	101601 0165	49,60
17.0	257	159	MT 2	0.35	101601 0170	49,10
17.5	263	165	MT 2	0.35	101601 0175	56,50
18.0	263	165	MT 2	0.35	101601 0180	56,30
18.5	269	171	MT 2	0.35	101601 0185	62,70
19.0	269	171	MT 2	0.35	101601 0190	62,10
20.0	275	177	MT 2	0.35	101601 0200	67,70
20.5	282	184	MT 2	0.35	101601 0205	84,70
21.0	282	184	MT 2	0.35	101601 0210	77,30
21.5	282	184	MT 2	0.35	101601 0215	92,-
22.0	289	191	MT 2	0.35	101601 0220	84,50
22.5	296	198	MT 2	0.35	101601 0225	101,-
23.0	296	198	MT 2	0.35	101601 0230	87,60

D h8 mm	L mm	L1 mm	Shank	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
24.0	327	206	MT3	0.35	101601 0240	108,50
25.0	327	206	MT3	0.35	101601 0250	109,50
26.0	335	214	MT3	0.45	101601 0260	124,50
27.0	343	222	MT3	0.45	101601 0270	141,-
28.0	343	222	MT3	0.45	101601 0280	149,50
29.0	351	230	MT3	0.45	101601 0290	173,-
30.0	351	230	MT3	0.45	101601 0300	170,50
31.0	360	239	MT3	0.45	101601 0310	219,-
32.0	397	248	MT 4	0.45	101601 0320	224,-
33.0	397	248	MT 4	0.45	101601 0330	230,-
34.0	406	257	MT 4	0.45	101601 0340	288,-
35.0	406	257	MT 4	0.45	101601 0350	281,-
36.0	416	267	MT 4	0.45	101601 0360	248,-
37.0	416	267	MT 4	0.45	101601 0370	365,-
38.0	426	277	MT 4	0.45	101601 0380	344,-
39.0	426	277	MT 4	0.45	101601 0390	375,-
40.0	426	277	MT 4	0.45	101601 0400	375,-
41.0	436	287	MT 4	0.56	101601 0410	460,-
42.0	436	287	MT 4	0.56	101601 0420	460,-
43.0	447	298	MT 4	0.56	101601 0430	485,-
44.0	447	298	MT 4	0.56	101601 0440	485,-
45.0	447	298	MT 4	0.56	101601 0450	485,-
47.0	459	310	MT 4	0.56	101601 0470	619,-
48.0	470	321	MT 4	0.56	101601 0480	639,-
49.0	470	321	MT 4	0.56	101601 0490	649,-
50.0	470	321	MT 4	0.56	101601 0500	619,-

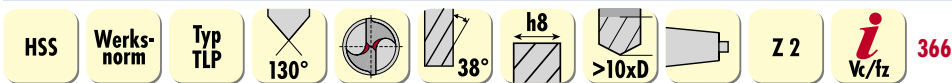
1104

# Machine tap

Page 231



# ATORN® Deep hole drill with MT shank

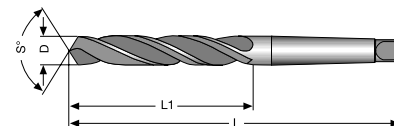


- Extra-long, for deep bores
- **Wide chip flutes for better chip removal**
- Morse taper shank
- **Pilot hole recommended**

**Deep bore profile**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		22	14	6	7	6		20	20	5			50	40	30					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	L mm	L1 mm	Series	Shank	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
8.0	181	100	0	MT 1	0.15	101700 0800	46,-
8.0	265	165	1	MT 1	0.15	101700 0801	60,70
8.0	330	210	2	MT 1	0.15	101700 0802	94,-
8.0	500	420	3	MT 1	0.15	101700 0803	98,70
9.0	188	107	0	MT 1	0.16	101700 0900	51,30
9.0	275	175	1	MT 1	0.16	101700 0901	70,90
9.0	345	220	2	MT 1	0.16	101700 0902	102,-
9.0	500	420	3	MT 1	0.16	101700 0903	107,-
10.0	197	116	0	MT 1	0.16	101700 1000	52,40
10.0	285	185	1	MT 1	0.16	101700 1001	72,60
10.0	360	235	2	MT 1	0.16	101700 1002	103,50
10.0	500	420	3	MT 1	0.16	101700 1003	123,50
11.0	206	125	0	MT 1	0.17	101700 1100	66,30
11.0	300	195	1	MT 1	0.17	101700 1101	84,10
11.0	500	420	3	MT 1	0.17	101700 1103	135,-
12.0	215	134	0	MT 1	0.18	101700 1200	69,90
12.0	310	205	1	MT 1	0.18	101700 1201	94,30
12.0	395	260	2	MT 1	0.18	101700 1202	145,50
12.0	500	420	3	MT 1	0.18	101700 1203	144,-
13.0	215	134	0	MT 1	0.18	101700 1300	73,-
13.0	310	205	1	MT 1	0.18	101700 1301	98,10
13.0	395	260	2	MT 1	0.18	101700 1302	151,50
14.0	223	142	0	MT 1	0.19	101700 1400	73,-
14.0	325	220	1	MT 1	0.19	101700 1401	110,-
14.0	410	275	2	MT 1	0.19	101700 1402	163,50
14.0	500	420	3	MT 1	0.19	101700 1403	174,50
14.0	600	500	4	MT 1	0.19	101700 1404	242,-
15.0	245	147	0	MT 2	0.19	101700 1500	81,20
15.0	340	220	1	MT 2	0.19	101700 1501	120,50

D h8 mm	L mm	L1 mm	Series	Shank	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
15.0	425	275	2	MT 2	0.19	101700 1502	166,-
15.0	600	500	4	MT 2	0.19	101700 1504	283,-
16.0	251	153	0	MT 2	0.20	101700 1600	91,-
16.0	355	230	1	MT 2	0.20	101700 1601	125,-
16.0	445	295	2	MT 2	0.20	101700 1602	169,50
16.0	500	400	3	MT 2	0.20	101700 1603	206,-
16.0	600	500	4	MT 2	0.20	101700 1604	304,-
17.0	257	159	0	MT 2	0.21	101700 1700	102,-
17.0	355	230	1	MT 2	0.21	101700 1701	129,-
18.0	263	165	0	MT 2	0.21	101700 1800	106,-
18.0	370	245	1	MT 2	0.21	101700 1801	142,-
18.0	465	310	2	MT 2	0.21	101700 1802	203,-
18.0	500	400	3	MT 2	0.21	101700 1803	226,-
18.0	600	500	4	MT 2	0.21	101700 1804	349,-
20.0	275	177	0	MT 2	0.22	101700 2000	129,-
20.0	385	260	1	MT 2	0.22	101700 2001	182,-
20.0	490	325	2	MT 2	0.22	101700 2002	250,-
20.0	500	400	3	MT 2	0.22	101700 2003	250,-
20.0	600	500	4	MT 2	0.22	101700 2004	349,-
21.0	282	184	0	MT 2	0.23	101700 2100	156,50
21.0	385	260	1	MT 2	0.23	101700 2101	210,-
21.0	600	500	4	MT 2	0.23	101700 2104	355,-
22.0	405	270	1	MT 2	0.23	101700 2201	220,-
22.0	600	500	4	MT 2	0.23	101700 2204	355,-
24.0	440	290	1	MT3	0.24	101700 2401	288,-
24.0	600	475	4	MT3	0.24	101700 2404	370,-
25.0	327	206	0	MT3	0.25	101700 2500	216,-
25.0	600	475	4	MT3	0.25	101700 2504	385,-

1104

1104

**Over 200,000 tools available online!**  
Register online now!

**www.saratools.com**



# ATORN® Core drill with MT shank

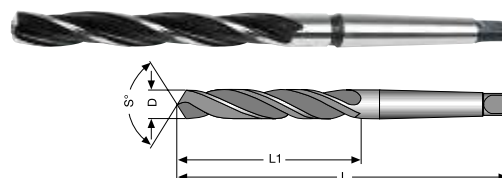
HSS
DIN 343
Typ N
120°
25°
h8
Z 3
Vc/fz 371

**3 cutting edges**

- **MT shank with driving pin lugs in accordance with DIN 228**
- Robust drill with strong core for optimum guidance in the bore hole
- **For drilling pre-drilled, pre-cast or pre-punched holes**
- The sturdy design and 3 cutting edges correct alignment inaccuracies and roundness issues in prefabricated holes
- **Also available with straight shank where required**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 30	● 25					○ 15				○ 30		○ 20					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8	L	L1	Pre-drill min. Ø	Shank	Feed f	art.no.	€
mm	mm	mm	mm		steel < 1000 N/mm² mm/rev		
7.80	156	75	5.6	MT 1	0.10	101515 0780	58,50
8.00	156	75	5.6	MT 1	0.10	101515 0800	62,10
8.80	162	81	6.3	MT 1	0.12	101515 0880	65,60
9.80	168	87	7.0	MT 1	0.12	101515 0980	58,50
10.00	168	87	7.0	MT 1	0.12	101515 1000	68,20
10.75	175	94	7.7	MT 1	0.12	101515 1075	75,80
11.00	175	94	7.7	MT 1	0.12	101515 1100	69,20
11.75	182	101	8.4	MT 1	0.12	101515 1175	61,60
12.00	182	101	8.4	MT 1	0.12	101515 1200	75,80
12.75	182	101	9.1	MT 1	0.12	101515 1275	75,80
13.00	182	101	9.1	MT 1	0.12	101515 1300	59,-
13.75	189	108	9.8	MT 1	0.12	101515 1375	68,70
14.00	189	108	9.8	MT 1	0.12	101515 1400	88,-
14.75	212	114	10.5	MT 2	0.18	101515 1475	76,80
15.00	212	114	10.5	MT 2	0.18	101515 1500	80,90
15.75	218	120	11.2	MT 2	0.18	101515 1575	78,90
16.00	218	120	11.2	MT 2	0.18	101515 1600	97,20
16.75	223	125	11.9	MT 2	0.18	101515 1675	84,-
17.00	223	125	11.9	MT 2	0.18	101515 1700	92,10
17.75	228	130	12.6	MT 2	0.18	101515 1775	86,-
18.00	228	130	12.6	MT 2	0.18	101515 1800	104,-
18.70	233	135	13.3	MT 2	0.18	101515 1870	115,50
19.00	233	135	13.3	MT 2	0.18	101515 1900	90,60
19.70	238	140	14.0	MT 2	0.18	101515 1970	96,20
20.00	238	140	14.0	MT 2	0.18	101515 2000	85,-
20.70	243	145	14.6	MT 2	0.22	101515 2070	121,-
21.00	243	145	14.6	MT 2	0.22	101515 2100	113,50

D h8	L	L1	Pre-drill min. Ø	Shank	Feed f	art.no.	€
mm	mm	mm	mm		steel < 1000 N/mm² mm/rev		
21.70	248	150	15.3	MT 2	0.22	101515 2170	121,-
22.00	248	150	15.3	MT 2	0.22	101515 2200	113,50
22.70	253	155	16.0	MT 2	0.22	101515 2270	130,-
23.00	253	155	16.0	MT 2	0.22	101515 2300	125,50
23.70	281	160	16.6	MT3	0.22	101515 2370	121,-
24.00	281	160	16.6	MT3	0.22	101515 2400	118,-
24.70	281	160	17.3	MT3	0.22	101515 2470	142,50
25.00	281	160	17.3	MT3	0.22	101515 2500	125,50
25.70	286	165	18.0	MT3	0.22	101515 2570	145,50
26.00	286	165	18.0	MT3	0.22	101515 2600	141,50
26.70	291	170	18.6	MT3	0.22	101515 2670	171,-
27.70	291	170	19.3	MT3	0.22	101515 2770	175,-
28.00	291	170	19.3	MT3	0.22	101515 2800	148,50
28.70	296	175	20.0	MT3	0.22	101515 2870	172,50
29.70	296	175	20.5	MT3	0.22	101515 2970	178,50
30.00	296	175	20.5	MT3	0.22	101515 3000	187,50
30.60	301	180	21.0	MT3	0.22	101515 3060	230,-
31.60	334	185	22.0	MT 4	0.22	101515 3160	263,-
32.00	334	185	22.0	MT 4	0.22	101515 3200	193,50
33.00	334	185	23.0	MT 4	0.22	101515 3300	220,-
33.60	339	190	24.0	MT 4	0.22	101515 3360	290,-
34.60	339	190	25.0	MT 4	0.22	101515 3460	293,-
37.60	349	200	26.5	MT 4	0.22	101515 3760	270,-
38.00	349	200	26.5	MT 4	0.22	101515 3800	270,-
39.60	349	200	28.0	MT 4	0.22	101515 3960	287,-
40.00	349	200	28.0	MT 4	0.22	101515 4000	289,-

1105

1105



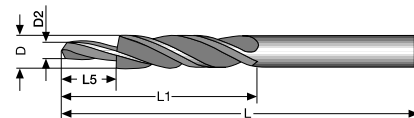
... with brainpower.

**ATORN®**  
Performance demands quality

## ATORN® Step drills

HSS
DIN 8378
DIN 8374
DIN 8376
118°
29°
Vap.
i Vc/fz
366

- Cone-shaped shell
- **Vapour-treated**
- Point thinning in accordance with DIN 1412 type A
- Ø tolerance h8, other design features in accordance with DIN 1414
- **Note:** The cutting speed is determined by the large diameter, while the feed rate is determined by the small diameter for core drilling



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	G6/G15	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●					●	○											
		25	20					25	20											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

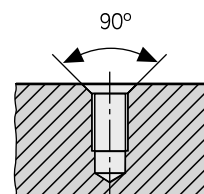
### 90° through-hole countersink

- For thread core drilling in accordance with DIN 336
- For through-holes in accordance with DIN EN 20273



for thread	D h9 mm	D2 h8 mm	L5 mm	L1 mm	L mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
M 3	3.4	2.5	8.8	39	70	0.03	102101 0030	23,30
M 4	4.5	3.3	11.4	47	80	0.04	102101 0040	25,50
M 5	5.5	4.2	13.6	57	93	0.05	102101 0050	26,20
M 6	6.6	5	16.5	63	101	0.07	102101 0060	29,50
M 8	9.0	6.8	21	81	125	0.08	102101 0080	33,70
M 10	11.0	8.5	25.5	94	142	0.10	102101 0100	43,20

1105



DIN 8378

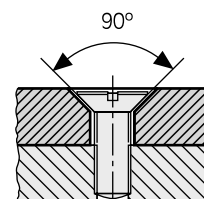
### 90° fine countersink

- For through-holes in accordance with DIN EN 20273
- For 90° countersunk screw heads



for thread	D h9 mm	D2 h8 mm	L5 mm	L1 mm	L mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
M 3	6.0	3.2	9	63	101	0.03	102102 0030	27,70
M 4	8.0	4.3	11	75	117	0.04	102102 0040	32,10
M 5	10.0	5.3	13	87	133	0.05	102102 0050	40,30
M 6	11.5	6.4	15	94	142	0.07	102102 0060	45,-
M 8	15.0	8.4	19	114	169	0.08	102102 0080	75,20
M 10	19.0	10.5	23	135	198	0.10	102102 0100	115,50

1105



DIN 8374

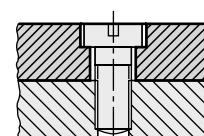
### 180° countersink

- For through-holes in accordance with DIN EN 20273
- For 180° countersunk screw heads in accordance with DIN 974-1
- For screws in accordance with DIN 6912, 7513, 7984



for thread	D h9 mm	D2 h8 mm	L5 mm	L1 mm	L mm	Feed f steel < 700 N/mm² mm/rev	art.no.	€
M 3	6.0	3.4	9	57	93	0.03	102103 0030	29,80
M 4	8.0	4.5	11	75	117	0.04	102103 0040	31,60
M 5	10.0	5.5	13	87	133	0.05	102103 0050	38,10
M 6	11.0	6.6	15	94	142	0.07	102103 0060	44,-
M 8	15.0	9	19	114	169	0.08	102103 0080	55,90
M 10	18.0	11	23	130	191	0.10	102103 0100	115,-

1105



DIN 8376



## SARA® STEP step drill

HSS
Werks-norm
TiN

- **For burr-free drilling and reaming of sheet metal, pipes and sections and one-sided deburring in a single operation**
- The exact bore diameter results from the cylindrical graduation, the ground section of each step deburrs the next smaller bore diameter
- Point thinning in accordance with DIN 1412 C
- Especially suitable for use on hand drills when drilling thin materials
- **Corner breakers for double-sided deburring** (up to 1.5 mm sheets)
- No need for pre-drilling or centre punching even with curved surfaces
- **Straight shank with 3 driving planes prevents "slipping" in the chuck**
- Laser scaling of bore diameters and rotational speed data
- **Note:** material thickness suitable up to 5 mm

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		●	●	○	○			●	○			○	○	○					

### Single

No.	D mm	L mm	Number of steps	D1 mm	Blank		TiN	
					art.no.	€	art.no.	€
1	4.0 - 12.0	79	9	6	102650 0001	23,60	102652 0001	29,40
2	6.0 - 20.0	71	8	9	102650 0002	31,80	102652 0002	51,40
3	6.0 - 30.0	100	13	10	102650 0003	57,-	102652 0003	64,10
					1137		1137	



102650 0003



102652 0003



102651 0001

102653 0001

### Sets

Contents	Blank		TiN	
	art.no.	€	art.no.	€
Step drill bit No. 1-3 (1 of each)	102651 0001	133,50	102653 0001	157,-
	1137		1137	

## SARA® TS cone drill bit

HSS
Werks-norm
TiN
Vap.

- **For burr-free drilling and reaming of sheet metal, pipes and sections**
- Cylindrically ground / milled chip flute for absolutely smooth running and high cutting power
- **Straight shank with 3 driving planes prevents "slipping" in the chuck**
- Laser scaling of bore diameters and rotational speed data

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		●	●	●	○			●	●			○	○	○					

### Single

No.	D mm	L mm	D1 mm	Vapour-treated		TiN	
				art.no.	€	art.no.	€
0	3.0 - 14.0	58	6	102660 0314	14,35	102665 0314	25,90
1	8.0 - 20.0	66	8	102660 0820	22,30	102665 0820	33,80
2	16.0 - 30.5	77	9	102660 1630	46,40	102665 1630	57,50
3	26.0 - 40.0	90	9	102660 2640	73,80	102665 2640	109,-
4	36.0 - 50.0	87	9	102660 3650	97,20	102665 3650	178,-
6	40.0 - 61.0	90	10	102660 0430	32,70	102665 0430	63,10
				1137		1137	



102660 1630



102665 1630



102661 0001

102666 0001

### Sets

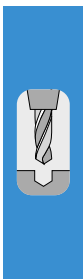
Contents	Vapour-treated		TiN	
	art.no.	€	art.no.	€
Cone drill bit No. 0, 1 and 2 incl. cutting paste	102661 0001	88,-	102666 0001	132,50
	1137		1137	

**EUROBOOR Core drills**  
FOR PROFESSIONALS BY PROFESSIONALS



- **Strong HSS core drill**
- Super-fast drilling times and longer service life
- Guaranteed core removal
- **5 to 10 times longer service life than with a traditional twist drill bit**
- **No pre-drilling required**
- Surface is smooth and burr-free
- **Precise centring by means of guide pin**
- Other versions up to Ø 130 mm and various cutting material qualities (e.g. HSS-Co8) available on request

**Ideal for machines with low drive power**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	○		○	○		○	○				●	○						

**Core drills**

- Weldon shank Ø 19.05 mm

D mm	art.no.	Cutting depth 30 mm €	art.no.	Cutting depth 55 mm €
12.0	100601 0120	22,30	100602 0120	33,50
13.0	100601 0130	22,30	100602 0130	33,50
14.0	100601 0140	22,30	100602 0140	31,40
15.0	100601 0150	22,30	100602 0150	31,40
16.0	100601 0160	23,80	100602 0160	32,70
17.0	100601 0170	25,40	100602 0170	33,50
18.0	100601 0180	25,40	100602 0180	36,50
19.0	100601 0190	26,10	100602 0190	37,20
20.0	100601 0200	26,90	100602 0200	38,70
21.0	100601 0210	28,30	100602 0210	41,70
22.0	100601 0220	29,10	100602 0220	43,20
23.0	100601 0230	30,50	100602 0230	44,-
24.0	100601 0240	32,70	100602 0240	46,20
25.0	100601 0250	33,50	100602 0250	48,50
26.0	100601 0260	34,90	100602 0260	49,90
		1150	1150	

D mm	art.no.	Cutting depth 30 mm €	art.no.	Cutting depth 55 mm €
27.0	100601 0270	35,70	100602 0270	52,90
28.0	100601 0280	37,20	100602 0280	55,-
29.0	100601 0290	38,-	100602 0290	57,-
30.0	100601 0300	41,70	100602 0300	61,10
31.0	100601 0310	46,90	100602 0310	63,10
32.0	100601 0320	49,90	100602 0320	65,60
33.0	100601 0330	52,90	100602 0330	68,20
34.0	100601 0340	57,-	100602 0340	73,30
35.0	100601 0350	63,10	100602 0350	75,80
40.0	100601 0400	74,30	100602 0400	94,60
45.0	100601 0450	91,60	100602 0450	125,50
50.0	100601 0500	109,-	100602 0500	157,-
55.0	100601 0550	129,50	100602 0550	180,50
60.0	100601 0600	144,50	100602 0600	209,-
		1150	1150	



**Ejectors (centring pins)**

Description	art.no.	Cutting depth 30 mm €	art.no.	Cutting depth 55 mm €
Ejector pin, Ø 12-60 mm	100603 0070	9,40	100603 0090	13,80
		1150	1150	



**7-pcs. set**

- For 30 mm cut depth

Contents	art.no.	€
1 ejector pin and 2 core drill bits in each size, Ø 14, 18, 22 mm	100601 1007	171,-
		1150



**Holding fixtures**

- Internal coolant supply (ICS)

Description	art.no.	€
Industrial holding fixture MT 2 with internal cooling, Weldon Ø 19.05 mm	100605 0020	127,50
Industrial holding fixture MT 3 with internal cooling, Weldon Ø 19.05 mm	100605 0030	148,50
		1150



## SARA® Carbide-tipped twist drill bit



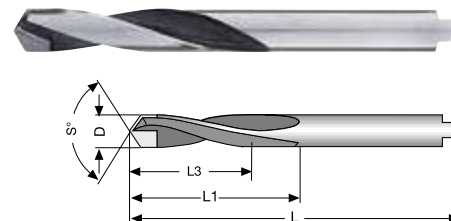
- With driving pin in accordance with DIN 1809 for use in collets
- HSS shank
- **Cutting element: carbide K10**
- Solid carbide cutting edges with four-facet grinding
- Self-centring
- Intermediate dimensions available on request

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●	○			●	●	●	○	●		
		30-60	25-50	15-30				50-70	30-50	25-35			40-150	40-150	40-100	20-100	6-10		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D h8 mm	L mm	L1 mm	L3 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2.0	45	18	12	0.02	5 110501 0020	13,20
3.0	50	20	16	0.02	5 110501 0030	11,55
3.2	56	25	21	0.02	5 110501 0032	13,15
3.5	56	25	20	0.02	5 110501 0035	11,50
4.0	56	25	20	0.02	5 110501 0040	11,55
4.2	63	28	23	0.02	5 110501 0042	13,95
4.5	63	28	22	0.02	5 110501 0045	11,90
5.0	63	28	22	0.03	5 110501 0050	11,90
5.5	71	32	25	0.03	5 110501 0055	13,05
6.0	71	32	25	0.03	5 110501 0060	13,30
6.5	71	32	24	0.03	1 110501 0065	15,20
7.0	80	40	31	0.04	1 110501 0070	15,20
7.5	80	40	31	0.04	1 110501 0075	16,80
8.0	80	40	30	0.04	1 110501 0080	16,90
8.5	90	50	40	0.04	1 110501 0085	19,15
9.0	90	50	39	0.04	1 110501 0090	19,15
9.5	90	50	39	0.04	1 110501 0095	20,90
10.0	100	56	44	0.04	1 110501 0100	20,60
10.5	100	56	44	0.05	1 110501 0105	25,50
11.0	100	56	42	0.05	1 110501 0110	25,50
12.0	112	63	47	0.05	1 110501 0120	29,70
13.0	112	63	47	0.05	1 110501 0130	35,30
14.0	125	71	54	0.05	1 110501 0140	47,-
15.0	125	71	53	0.06	1 110501 0150	54,20
16.0	140	80	60	0.06	1 110501 0160	62,10

1108








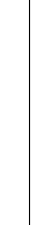






THE COMPLETE  
**MACHINING RANGE**

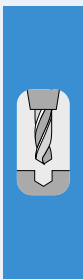







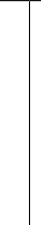






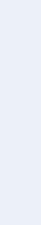
**PALBIT**  
Machining tools  
411 pages  
Art.no. 019900 0315






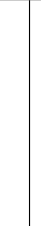






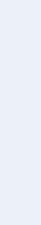
Overview of all free manufacturers' catalogues on page 16/17














## Overview of solid carbide twist drill bits


















Sorting by drilling depth and shank design	Factory standard													
														
Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	SARA®	
Drilling depth														
ISO	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	
Diameter range [mm]	1 - 5	5 - 20	5 - 20	2 - 20	2 - 20	2 - 20	2 - 20	2 - 20	2 - 20	2 - 20	2 - 12	2 - 12	2 - 12	3 - 20
Type	A									extra long	extra long	extra long		
Point angle	60°	90°	120°	90°	120°	142°	90°	120°	142°	90°	120°	142°	90°	
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	
Coating							TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	
Item number	100501....	100520....	100530....	100570....	100571....	100572....	100580....	100581....	100582....	100583....	100584....	100585....	100540....	
Catalogue page	111	111	111	112	112	112	112	112	112	113	113	113	113	



Sorting by drilling depth and shank design	Factory standard											DIN 6539	
													
Brand	SARA®	SARA®				ATORN®						ATORN®	ATORN®
Drilling depth						3 x D	2 x D	5 x D	12 x D	20 x D	30 x D	3 x D	3 x D
ISO	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H
Diameter range [mm]	3 - 20	3 - 20	3 - 20	3 - 20	3 - 20	0,1 - 3,0	0,7 - 2	0,7 - 2	1 - 2	1 - 2	1 - 2	0,5 - 16,0	0,5 - 16
Type			HYP-LDS	HYP-LDS	HYP-LDS		ADO-MICRO	ADO-MICRO	ADO-MICRO	ADO-MICRO	ADO-MICRO	N	N
Point angle	120°	142°	90°	120°	142°	118°, 130°	140°	135°	135°	135°	135°	118°	118°
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN				TiAlN	IchAda	IchAda	IchAda	IchAda	IchAda		TiN
Item number	100550....	100560....	100590....	100592....	100594....	111550....	111721....	111722....	111723....	111724....	111725....	111005....	111008....
Catalogue page	113	113	114	114	114	115	116	116	117	117	117	118	118

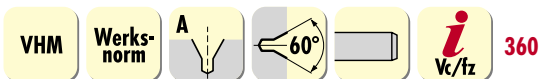
Sorting by drilling depth and shank design	DIN 6537										Factory standard		Similar to DIN 338
													
Brand	ATORN®	SARA®	ATORN®	ATORN®	SARA®	ATORN®	ATORN®		ATORN®	ATORN®		ATORN®	ATORN®
Drilling depth	3 x D	3 x D	3 x D	3 x D	3 x D, IC	3 x D, IC	3 x D, IC	3 x D	3 x D, IC	3 x D, IC	3 x D, IC	3 x D	5 x D
ISO	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	M S	M S	P M K S N H	P K H	P M K S N H
Diameter range [mm]	0,5 - 16	1 - 20	1 - 20	3 - 20	3 - 20	1 - 20	3 - 20	3 - 20	3 - 20	3 - 20	2,8 - 20	1 - 20	1 - 13
Type	N	U	U	U	U	U	U	HYP-HPO	Ultra-M	Ultra-M	VA	HARD	N
Point angle	118°	140°	140°	140°	140°	140°	140°	140°	140°	140°	140°	140°	118°
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiNplus	TiAlNplus	TiAlNplus	TiNplus	TiAlNplus	TiAlNplus	TiAlN	TiAlN	TiAlN	TiAlN	TiAlSiN	
Item number	111009....	111503....	111562....	111563....	111507....	111564....	111565....	111628....	111545....	111549....	111613....	111535....	111010....
Catalogue page	118	120	122	122	124	125	125	127	128	128	130	131	133

	Similar to DIN 338		DIN 6537								Factory standard	DIN 6537	Factory standard	
Sorting by drilling depth and shank design														
	Brand	ATORN®	ATORN®	ATORN®	ATORN®	SARA®	ATORN®	ATORN®		ATORN®	ATORN®		SARA®	ATORN®
	Drilling depth	5 x D	5 x D	5 x D	5 x D	5 x D, IC	5 x D, IC	5 x D, IC	5 x D	5 x D, IC	5 x D, IC	5 x D, IC	5 x D, IC	5 x D, IC
	ISO	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K S N H	M S	M S	P M K S N	M S N	N
	Diameter range [mm]	1 - 13	1 - 13	1 - 20	3 - 20	1 - 20	1 - 20	3 - 20	3 - 20	3 - 20	3 - 20	2,78 - 20	3 - 20	2,5 - 20
	Type	N	N	U	U	U	U	U	HYP-HPO	VA	VA	VA	ALU	ALU
	Point angle	118°	118°	140°	140°	140°	140°	140°	140°	140°	140°	140°	140°	135°
	Cutting material	VHM	VHM	VHM	VHM	VHM	VHM	VHM	VHM	VHM	VHM	VHM	VHM	VHM
	Coating	TiN	TiAlN	TiAlNplus	TiAlNplus	TiNplus	TiAlNplus	TiAlNplus	TiAlN	TiAlN	TiAlN	TiAlN	ZrN	TiB2
	Item number	111011....	111012....	111566....	111567....	111512....	111568....	111569....	111629....	111547....	111551....	111615....	111410....	111400....
	Catalogue page	133	133	135	135	137	139	139	141	143	143	144	146	148

	Factory standard													
Sorting by drilling depth and shank design														
	Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®				
	Drilling depth	5 x D	5 x D, IC	8 x D, IC	12 x D, IC	5 x D, IC	16 x D, IC	20 x D, IC	25 x D, IC	30 x D, IC	Pilot drill bit	Deep-hole drill bit, IC	15 x D	20 x D
	ISO	P K H	P K H	P M K S N H	P M K N H	P M K S N H	P M K	P M K	P M K	P M K	P M K	P M K	P M K	P M K
	Diameter range [mm]	2 - 18	1 - 20	3 - 20	3 - 20	2,02 - 12,02	3 - 12	2 - 12	3 - 12	2 - 12	3.03 - 12.03	2 - 12	3 - 12	3 - 12
	Type	HARD	HARD	U	TLP	PLT	TLP	TLP	TLP	TLP	PLT	TLP	ADO	ADO
	Point angle	140°	140°	140°	140°	140°	135°	135°	135°	135°	160°	140°	140°	140°
	Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	VHM	VHM
	Coating	TiAlSiN	TiAlSiN	TiAlNplus	TiAlNplus	TiAlNplus	TiAlNplus	TiAlNplus	TiAlNplus	TiAlNplus	WDI	WDI	EgiAs	EgiAs
	Item number	111536....	111537....	111570....	111572....	111573....	111574....	111575....	111576....	111577....	111726....	111715....	111716....	111717....
	Catalogue page	149	149	151	152	153	154	155	156	157	158	158	160	161

	Factory standard						DIN 6539	Factory standard				DIN 338	Factory standard	
Sorting by drilling depth and shank design														
	Brand					ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
	Drilling depth	30 x D	40 x D	50 x D	2 x D	3 x D, IC	5 x D, IC	5 x D	VHM-Bohrer, Z3	Drill reamer, IC	Drill reamer	3 x D	5 x D	Step drill bit
	ISO	P M K	P M K	P M K	P K N H	P M K N H	P M K N H	P M K	P M K S N	P K	N	N	N	P M K S N H
	Diameter range [mm]	3 - 10	3 - 10	3 - 8	2 - 20	3 - 20	3 - 20	3 - 20	3 - 16	3.98 - 20	2 - 12	3 - 12	2,4 - 16	for M3-M12
	Type	ADO	ADO	ADO	N	Flat	N	High Feed	N	N	CFK/GFK	CFK/GFK	CFK/GFK	CFK/GFK
	Point angle	140°	140°	140°	180°	180°	180°	135°	150°	140°	90°	90°	90°	90°/180°
	Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
	Coating	EgiAs	EgiAs	EgiAs	EgiAs	TiAlN	TiAlN	TiAlN	TiN	TiAlN	DLC	Solid carbide	Solid carbide	TiAlN
	Item number	111718....	111719....	111720....	111711....	111709....	111710....	111585....	111014....	111701....	111815....	111810....	111805....	102202....
	Catalogue page	162	163	164	164	166	167	169	170	171	171	172	172	173

## ATORN® Centring drills



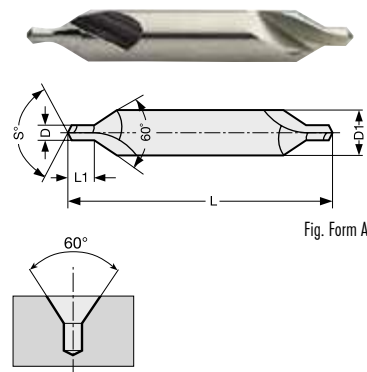
- For centring holes without protected centre DIN 332 A
- Spiral-fluted, bare surface
- Precision-ground version, high true-running accuracy
- With application of the workpiece to the centre point over a large surface area
- Suitable for heavy workpieces when using revolving centre points

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si		<55 HRc	<60 HRc	≥60 HRc	
		●	●	●	○	○	○	●	●	○	○	○	●	●	●		○		
		60-80	50-60	25-40	20-30	20-30	15-25	50-60	35-50	20-30	20-25	20-25	100-150	70-90	70-90		20-35		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D k12 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
1	3.15	31.5	1.3 - 1.9	0.06	<b>100501 0100</b>	<b>39,40</b>
1.25	3.15	31.5	1.6 - 2.2	0.06	100501 0125	39,40
1.6	4	35.5	2.0 - 2.8	0.06	100501 0160	41,20
2	5	40	2.5 - 3.3	0.06	100501 0200	46,-
2.5	6.3	45	3.1 - 4.1	0.06	100501 0250	51,70
3.15	8	50	3.9 - 4.9	0.07	100501 0315	62,50
4	10	56	5.0 - 6.2	0.07	100501 0400	74,70
5	12.5	63	6.3 - 7.5	0.07	100501 0500	111,50

1179



## ATORN® NC spotting drill bits



- S° = point angle 90° or 120°
- Spiral-fluted
- **Cutting material: solid carbide K10**
- For fast drilling on NC/CNC machines and machining centres with precise positioning

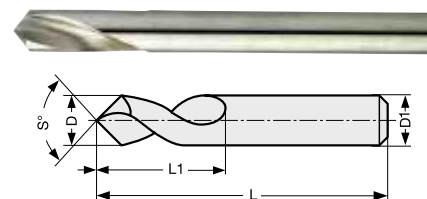
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si		<55 HRc	<60 HRc	≥60 HRc	
		●	●	●	○	○		●	●	○	○		●	●	●		○		
		60-100	55-75	30-50	25-50	25-50		80-100	60-90	30-35	25-35		100-180	100-180	90-120		25-30		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D h6 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	90°		120°	
					art.no.	€	art.no.	€
5	5	62	14	0.07	<b>100520 0500</b>	<b>25,90</b>	<b>100530 0500</b>	<b>25,90</b>
6	6	66	16	0.13	100520 0600	26,90	100530 0600	26,90
8	8	79	21	0.13	100520 0800	37,50	100530 0800	37,50
10	10	89	25	0.20	100520 1000	53,10	100530 1000	53,10
12	12	102	30	0.20	100520 1200	68,90	100530 1200	68,90
16	16	115	37.5	0.27	100520 1600	126,50	100530 1600	126,50
20	20	131	45	0.27	100520 2000	226,-	100530 2000	226,-

1179

1179





## ATORN® NC spotting drill

NEW

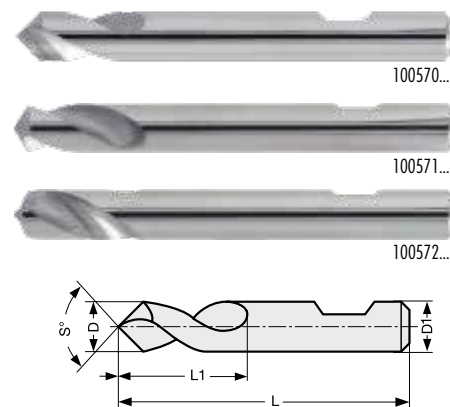
VHM Werks-norm 90° 120° 142° DIN 6535 HB Vc/tz 361

- S° = 90°, 120° and 142° point angle
- Straight shank with clamping surface in accordance with DIN6535-HB (from Ø 6mm)
- **Cutting material: SC, uncoated**
- Spot drilling and countersinking on NC and CNC machines
- 142° point angle version for spot drilling for the next twist drill operation

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		60-100	55-75	30-50	25-50	25-50		80-90	70-90	35-40			150-200	100-180	110-140				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	90°		120°		142°	
					art.no.	€	art.no.	€	art.no.	€
2	2	32	6	0.07	100570 0200	21,10	100571 0200	21,10	100572 0200	21,10
3	3	46	12	0.07	100570 0300	21,10	100571 0300	21,10	100572 0300	21,10
4	4	55	12	0.07	100570 0400	22,80	100571 0400	22,80	100572 0400	22,80
5	5	62	14	0.07	100570 0500	23,60	100571 0500	23,60	100572 0500	23,60
6	6	66	20	0.13	100570 0600	24,60	100571 0600	24,60	100572 0600	24,60
8	8	79	25	0.13	100570 0800	34,40	100571 0800	34,40	100572 0800	34,40
10	10	89	25	0.20	100570 1000	48,90	100571 1000	48,90	100572 1000	48,90
12	12	102	30	0.20	100570 1200	63,10	100571 1200	63,10	100572 1200	63,10
16	16	115	35	0.27	100570 1600	117,-	100571 1600	117,-	100572 1600	117,-
20	20	131	40	0.27	100570 2000	209,-	100571 2000	209,-	100572 2000	209,-
					1179		1179		1179	



## ATORN® NC spotting drill

NEW

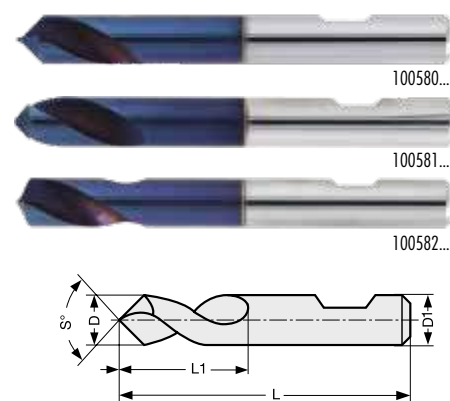
VHM Werks-norm 90° 120° 142° DIN 6535 HB TiAlN Vc/tz 361

- S° = 90°, 120° and 142° point angle
- Straight shank with clamping surface in accordance with DIN6535-HB (from Ø 6mm)
- **Cutting material: SC, TiAlN-coated**
- Spot drilling and countersinking on NC and CNC machines
- 142° point angle version for spot drilling for the next twist drill operation

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		60-100	55-75	30-50	25-50	25-50		80-90	70-90	35-40			150-200	100-180	110-140				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	90°		120°		142°	
					art.no.	€	art.no.	€	art.no.	€
2	2	32	6	0.07	100580 0200	27,10	100581 0200	27,10	100582 0200	27,10
3	3	46	12	0.07	100580 0300	27,10	100581 0300	27,10	100582 0300	27,10
4	4	55	12	0.07	100580 0400	34,90	100581 0400	34,90	100582 0400	34,90
5	5	62	14	0.07	100580 0500	36,20	100581 0500	36,20	100582 0500	36,20
6	6	66	20	0.13	100580 0600	37,-	100581 0600	37,-	100582 0600	37,-
8	8	79	25	0.13	100580 0800	46,50	100581 0800	46,50	100582 0800	46,50
10	10	89	25	0.20	100580 1000	61,60	100581 1000	61,60	100582 1000	61,60
12	12	102	30	0.20	100580 1200	78,90	100581 1200	78,90	100582 1200	78,90
16	16	115	35	0.27	100580 1600	136,50	100581 1600	136,50	100582 1600	136,50
20	20	131	40	0.27	100580 2000	245,-	100581 2000	245,-	100582 2000	245,-
					1179		1179		1179	



### ATORN® NC spotting drill, extra-long

VHM Werks-norm 90° 120° 142° DIN 6535 HB TiAlN i Vc/fz 361

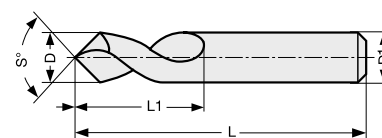
- S° = 90°, 120° and 142° point angle
- Straight shank with clamping surface in accordance with DIN6535-HB (from Ø 6mm)
- **long version for bridging protruding contours**
- **Cutting material: SC, TiAlN-coated**
- Spot drilling and countersinking on NC and CNC machines

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		60-100	55-75	30-50	25-50	25-50		80-90	70-90	35-40		150-200	100-180	110-140				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	90°		120°		142°	
					art.no.	€	art.no.	€	art.no.	€
2	2	75	6	0.07	100583 0200	31,20	100584 0200	31,20	100585 0200	31,20
3	3	80	12	0.07	100583 0300	31,20	100584 0300	31,20	100585 0300	31,20
4	4	100	12	0.07	100583 0400	40,10	100584 0400	40,10	100585 0400	40,10
5	5	120	14	0.07	100583 0500	47,-	100584 0500	47,-	100585 0500	47,-
6	6	140	20	0.13	100583 0600	50,-	100584 0600	50,-	100585 0600	50,-
8	8	140	25	0.13	100583 0800	68,70	100584 0800	68,70	100585 0800	68,70
10	10	170	25	0.20	100583 1000	83,40	100584 1000	83,40	100585 1000	83,40
12	12	170	30	0.20	100583 1200	107,-	100584 1200	107,-	100585 1200	107,-
16	16	200	35	0.27	100583 1600	184,50	100584 1600	184,50	100585 1600	184,50
20	20	200	40	0.27	100583 2000	326,-	100584 2000	326,-	100585 2000	326,-
					1179		1179		1179	



### SARA® NC spotting drill bits

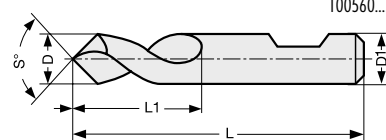
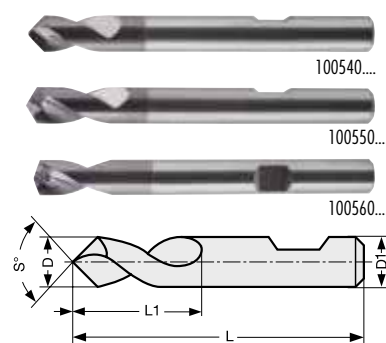
VHM Werks-norm 90° 120° 142° DIN 6535 HB TiAlN i Vc/fz 361

- S° = point angle 90°, 120° and 142°
- Straight shank with clamping surface in accordance with DIN6535-HB (from Ø 6 mm)
- **Cutting material: ultra-superfine grain solid carbide, TiAlN-coated**
- Spot drilling and countersinking on NC and CNC machines
- 142° point angle version for spot drilling for the next twist drill operation

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		60-100	55-75	30-50	25-50	25-50	20-35	80-90	70-90	35-40	30-40	30-40	150-200	100-180	110-140			25-30

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	90°		120°		142°	
					art.no.	€	art.no.	€	art.no.	€
3	3	38	8	0.07	100540 0300	28,40	100550 0300	28,40	100560 0300	28,40
4	4	50	10	0.07	100540 0400	28,40	100550 0400	28,40	100560 0400	28,40
5	5	50	13	0.07	100540 0500	28,40	100550 0500	28,40	100560 0500	28,40
6	6	57	13	0.13	100540 0600	38,60	100550 0600	38,60	100560 0600	38,60
8	8	63	19	0.13	100540 0800	48,30	100550 0800	48,30	100560 0800	48,30
10	10	66	20	0.20	100540 1000	66,40	100550 1000	66,40	100560 1000	66,40
12	12	73	22	0.20	100540 1200	80,90	100550 1200	80,90	100560 1200	80,90
16	16	82	24	0.27	100540 1600	143,50	100550 1600	143,50	100560 1600	143,50
20	20	92	30	0.27	100540 2000	239,-	100550 2000	239,-	100560 2000	239,-
					1167		1167		1167	



# NC spotting drill bits HYP-LDS

VHM    Werks-norm    90°    120°    142°    20°    h6    DIN 6535 HA    i Vc/fz    362

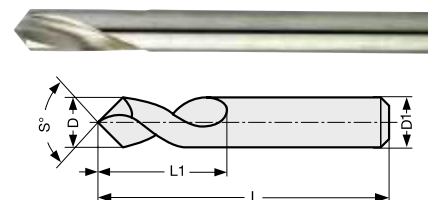
- For centring and chamfering
- Uncoated
- For steel and cast materials



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		63-80	40-63	32-50	20-28	20-28		63-100	63-100	20-25	20-25		80-160	80-160	80-140					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	90°		120°		142°	
					art.no.	€	art.no.	€	art.no.	€
3	3	35	8	0.06	100590 0300	12,-	100592 0300	12,-	100594 0300	12,-
4	4	40	10	0.08	100590 0400	14,50	100592 0400	14,50	100594 0400	14,50
6	6	50	16	0.09	100590 0600	20,-	100592 0600	20,-	100594 0600	20,-
8	8	60	23	0.12	100590 0800	26,25	100592 0800	26,25	100594 0800	26,25
10	10	70	24	0.14	100590 1000	41,75	100592 1000	41,75	100594 1000	41,75
12	12	70	25	0.17	100590 1200	57,-	100592 1200	57,-	100594 1200	57,-
16	16	80	30	0.22	100590 1600	103,-	100592 1600	103,-	100594 1600	103,-
20	20	100	35	0.27	100590 2000	181,-	100592 2000	181,-	100594 2000	181,-
					1107		1107		1107	



## ATORN® Solid carbide high-performance drill bit TiAlNplus HPC

INFO

The new ATORN TiAlNplus HPC solid carbide drill bit range covers a variety of materials. Thanks to the modern cutting material and innovative, newly-developed geometry the tools offer enormous capacity. What's more, they come in a variety of different materials with maximum process reliability and efficiency. You can benefit from the enormous breadth and depth of this range.

- Features:**
- 25 % longer service life compared with competitors
  - Wide range of applications (steel, stainless steel, cast iron and aluminium)
  - Newly developed TiAlNplus coating



Significantly increased service life and reduced process temperature

High wear-resistance combined with maximum toughness

Low cutting forces

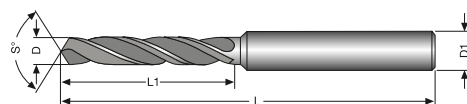
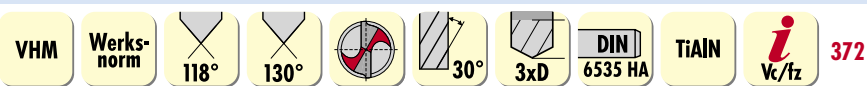
Perfect concentricity

Minimised breakages

Perfect chip removal

Low friction

# ATORN® Solid carbide micro drill bit



- $S^\circ = 130^\circ$  point angle,  $118^\circ$  up to a diameter of 0.35 mm
- **Cutting material: ultra-fine grain solid carbide**
- Tolerance D = 0.004 mm

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Co-alloy	GNP/EPF/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	○	●	○	●	●	○	○	○	○	○	○				
		50-75	50-70	20-25	20-35	20-35	20-35	60-100	60-80	10-30	10-30	10-20	150-220	100-160	80-130	60-95			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
0.10	3.0	38	1.0	0.01	111550 0010	31,10
0.15	3.0	38	2.0	0.01	111550 0015	27,80
0.20	3.0	38	2.5	0.01	111550 0020	24,10
0.25	3.0	38	4.0	0.01	111550 0025	16,30
0.30	3.0	38	5.5	0.01	111550 0030	16,30
0.35	3.0	38	5.5	0.01	111550 0035	16,30
0.40	3.0	38	6.0	0.01	111550 0040	16,30
0.45	3.0	38	6.0	0.01	111550 0045	16,30
0.50	3.0	38	6.0	0.01	111550 0050	16,30
0.55	3.0	38	8.0	0.01	111550 0055	16,30
0.60	3.0	38	8.0	0.01	111550 0060	16,30
0.65	3.0	38	8.0	0.01	111550 0065	16,30
0.70	3.0	38	8.0	0.01	111550 0070	16,30
0.75	3.0	38	8.0	0.01	111550 0075	16,30
0.80	3.0	38	8.0	0.01	111550 0080	16,30
0.85	3.0	38	8.0	0.01	111550 0085	16,30
0.90	3.0	38	8.0	0.01	111550 0090	16,30
0.95	3.0	38	8.0	0.01	111550 0095	16,30
0.97	3.0	38	8.0	0.02	111550 0097	16,30
0.98	3.0	38	8.0	0.02	111550 0098	16,30
0.99	3.0	38	8.0	0.02	111550 0099	16,30
1.00	3.0	38	10.0	0.02	111550 0100	16,30
1.01	3.0	38	10.0	0.02	111550 0101	16,30
1.02	3.0	38	10.0	0.03	111550 0102	16,30
1.03	3.0	38	10.0	0.03	111550 0103	16,30
1.05	3.0	38	10.0	0.03	111550 0105	16,30
1.10	3.0	38	10.0	0.03	111550 0110	16,30
1.15	3.0	38	10.0	0.03	111550 0115	16,30
1.20	3.0	38	10.0	0.03	111550 0120	16,30
1.25	3.0	38	10.0	0.03	111550 0125	16,30
1.30	3.0	38	10.0	0.03	111550 0130	16,30
1.35	3.0	38	10.0	0.03	111550 0135	16,30
1.40	3.0	38	10.0	0.03	111550 0140	16,30
1.45	3.0	38	10.0	0.03	111550 0145	16,30
1.47	3.0	38	10.0	0.03	111550 0147	16,30
1.48	3.0	38	10.0	0.03	111550 0148	16,30
1.49	3.0	38	10.0	0.03	111550 0149	16,30
1.50	3.0	38	12.0	0.03	111550 0150	16,30
1.51	3.0	38	12.0	0.03	111550 0151	16,30
1.52	3.0	38	12.0	0.03	111550 0152	16,30
1.53	3.0	38	12.0	0.03	111550 0153	16,30
1.55	3.0	38	12.0	0.03	111550 0155	16,30

1154

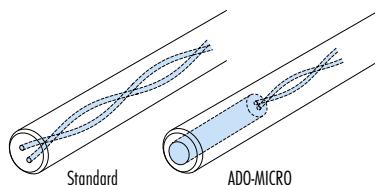
D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1.60	3.0	38	12.0	0.03	111550 0160	16,30
1.65	3.0	38	12.0	0.03	111550 0165	16,30
1.70	3.0	38	12.0	0.03	111550 0170	16,30
1.75	3.0	38	12.0	0.03	111550 0175	16,30
1.80	3.0	38	12.0	0.03	111550 0180	16,30
1.85	3.0	38	12.0	0.03	111550 0185	16,30
1.90	3.0	38	12.0	0.03	111550 0190	16,30
1.95	3.0	38	12.0	0.03	111550 0195	16,30
1.97	3.0	38	12.0	0.03	111550 0197	16,30
1.98	3.0	38	12.0	0.03	111550 0198	16,30
1.99	3.0	38	12.0	0.03	111550 0199	16,30
2.00	3.0	38	12.0	0.05	111550 0200	16,50
2.01	3.0	38	12.0	0.05	111550 0201	16,50
2.02	3.0	38	12.0	0.05	111550 0202	16,50
2.03	3.0	38	12.0	0.05	111550 0203	16,50
2.05	3.0	38	12.0	0.05	111550 0205	16,50
2.10	3.0	38	12.0	0.05	111550 0210	16,50
2.15	3.0	38	12.0	0.05	111550 0215	16,50
2.20	3.0	38	12.0	0.05	111550 0220	16,70
2.25	3.0	38	12.0	0.05	111550 0225	16,70
2.30	3.0	38	12.0	0.05	111550 0230	16,70
2.35	3.0	38	12.0	0.05	111550 0235	16,70
2.40	3.0	38	12.0	0.05	111550 0240	16,70
2.45	3.0	38	12.0	0.05	111550 0245	16,70
2.50	3.0	38	12.0	0.05	111550 0250	16,70
2.51	3.0	38	12.0	0.06	111550 0251	16,70
2.52	3.0	38	12.0	0.06	111550 0252	16,70
2.53	3.0	38	12.0	0.06	111550 0253	16,70
2.55	3.0	38	12.0	0.06	111550 0255	20,80
2.60	3.0	38	12.0	0.06	111550 0260	20,80
2.65	3.0	38	12.0	0.06	111550 0265	20,80
2.70	3.0	38	12.0	0.06	111550 0270	20,80
2.75	3.0	38	12.0	0.06	111550 0275	20,80
2.80	3.0	38	12.0	0.06	111550 0280	20,80
2.85	3.0	38	12.0	0.06	111550 0285	20,80
2.90	3.0	38	12.0	0.06	111550 0290	20,80
2.95	3.0	38	12.0	0.06	111550 0295	20,80
2.96	3.0	38	12.0	0.06	111550 0296	20,80
2.97	3.0	38	12.0	0.06	111550 0297	20,80
2.98	3.0	38	12.0	0.06	111550 0298	20,80
2.99	3.0	38	12.0	0.06	111550 0299	20,80
3.00	3.0	38	12.0	0.06	111550 0300	20,80

1154

# Solid carbide high-performance drill bit ADO-MICRO

VHM Werks-norm Typ TLP 140° 135° 30° 2xD 5xD 12xD 20xD 30xD DIN 6535 HA TiAlN Vc/fz 379

- 2xD, 5xD: 0.7-2mm, 12xD, 20xD, 30xD: 1-2mm
- **SC material, IchAda coating**
- Double guide chamfers for a high degree of stability
- Internal coolant supply with a hollow shank increases the flow rate



Deep-hole bores with minimal diameters

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CF/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		20-60	20-60	20-40	20-60	20-60	20-45	20-60	30-50	40-60	5-15	5-15	30-70	20-60	20-60		20-40		

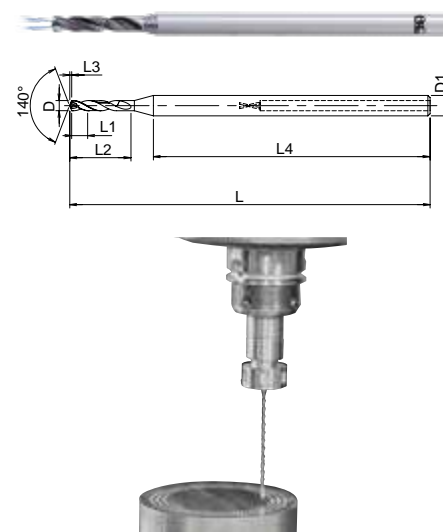
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## ADO-MICRO 2xD

- Point angle 140°
- Cutting tolerance: +0.001 to +0.010mm

D mm	L1 mm	L2 mm	L3 mm	L4 mm	L mm	D1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
0.7	1.4	4.2	0.1	38.5	47	3	0.014	111721 0070	93,20
0.75	1.5	4.5	0.1	38.3	47	3	0.014	111721 0075	93,20
0.8	1.6	4.8	0.1	41.1	50	3	0.014	111721 0080	93,20
0.85	1.7	5.1	0.2	40.9	50	3	0.014	111721 0085	93,20
0.9	1.8	5.4	0.2	40.7	50	3	0.014	111721 0090	93,20
0.95	1.9	5.7	0.2	40.5	50	3	0.014	111721 0095	93,20
1	2	6	0.2	42.8	53	3	0.02	111721 0100	82,70
1.1	2.2	6.6	0.2	42.4	53	3	0.02	111721 0110	82,70
1.2	2.4	7.2	0.2	41.9	53	3	0.02	111721 0120	82,70
1.3	2.6	7.8	0.2	41.5	53	3	0.02	111721 0130	82,70
1.4	2.8	8.4	0.3	41.1	53	3	0.02	111721 0140	82,70
1.5	3	9	0.3	40.7	53	3	0.03	111721 0150	82,70
1.6	3.2	9.6	0.3	40.3	53	3	0.03	111721 0160	82,70
1.7	3.4	10.2	0.3	39.9	53	3	0.03	111721 0170	82,70
1.8	3.6	10.8	0.3	39.5	53	3	0.03	111721 0180	82,70
1.9	3.8	11.4	0.3	39	53	3	0.03	111721 0190	82,70
2	4	12	0.4	43.6	58	3	0.04	111721 0200	82,70

1107

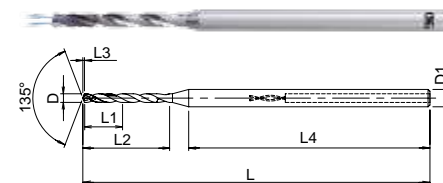


## ADO-MICRO 5xD

- Point angle 135°
- Cutting tolerance: 0 to -0.009mm

D mm	L1 mm	L2 mm	L3 mm	L4 mm	L mm	D1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
0.7	3.5	7	0.1	35.7	47	3	0.014	111722 0070	105,70
0.75	3.8	7.5	0.2	35.3	47	3	0.014	111722 0075	105,70
0.8	4	8	0.2	37.9	50	3	0.014	111722 0080	105,70
0.85	4.3	8.5	0.2	37.5	50	3	0.014	111722 0085	105,70
0.9	4.5	9	0.2	37.1	50	3	0.014	111722 0090	105,70
0.95	4.8	9.5	0.2	36.7	50	3	0.014	111722 0095	105,70
1	5	10	0.2	40.8	55	3	0.02	111722 0100	93,70
1.1	5.5	11	0.2	40	55	3	0.02	111722 0110	93,70
1.2	6	12	0.2	44.1	60	3	0.02	111722 0120	93,70
1.3	6.5	13	0.3	43.3	60	3	0.02	111722 0130	93,70
1.4	7	14	0.3	42.5	60	3	0.02	111722 0140	93,70
1.5	7.5	15	0.3	41.7	60	3	0.03	111722 0150	93,70
1.6	8	16	0.3	40.9	60	3	0.03	111722 0160	93,70
1.7	8.5	17	0.4	40.1	60	3	0.03	111722 0170	93,70
1.8	9	18	0.4	44.3	65	3	0.03	111722 0180	93,70
1.9	9.5	19	0.4	43.4	6	3	0.03	111722 0190	93,70
2	10	20	0.4	42.6	65	3	0.04	111722 0200	93,70

1107

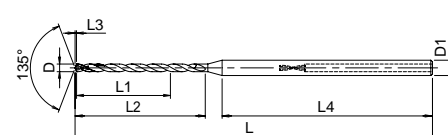


**ADO-MICRO 12xD**

- Point angle 135°
- Cutting tolerance: 0 to -0.009mm

D mm	L1 mm	L2 mm	L3 mm	L4 mm	L mm	D1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1	12	17	0.2	38.8	60	3	0.02	<b>111723 0100</b>	<b>126,50</b>
1.1	13.2	18.7	0.2	42.3	65	3	0.02	111723 0110	126,50
1.2	14.4	20.4	0.2	40.7	65	3	0.02	111723 0120	126,50
1.3	14.4	20.4	0.3	40.1	65	3	0.02	111723 0130	126,50
1.4	16.8	23.8	0.3	42.7	70	3	0.02	111723 0140	126,50
1.5	18	25.5	0.3	41.2	70	3	0.03	111723 0150	126,50
1.6	19.2	27.2	0.3	39.7	70	3	0.03	111723 0160	126,50
1.7	20.4	28.9	0.4	41.2	73	3	0.03	111723 0170	126,50
1.8	21.6	30.6	0.4	39.7	73	3	0.03	111723 0180	126,50
1.9	22.8	32.3	0.4	38.1	73	3	0.03	111723 0190	126,50
2	24	34	0.4	40.6	77	3	0.04	111723 0200	126,50

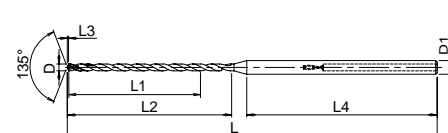
1107

**ADO-MICRO 20xD**

- Point angle 135°
- Cutting tolerance: 0 to -0.009mm

D mm	L1 mm	L2 mm	L3 mm	L4 mm	L mm	D1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1	20	24	0.2	39.8	68	3	0.02	<b>111724 0100</b>	<b>176,70</b>
1.1	22	26.4	0.2	44.6	75	3	0.02	111724 0110	176,70
1.2	24	28.8	0.2	42.3	75	3	0.02	111724 0120	176,70
1.3	26	31.2	0.3	40.1	75	3	0.02	111724 0130	176,70
1.4	28	33.6	0.3	43.9	81	3	0.02	111724 0140	176,70
1.5	30	36	0.3	41.7	81	3	0.03	111724 0150	176,70
1.6	32	38.4	0.3	39.5	81	3	0.03	111724 0160	176,70
1.7	34	40.8	0.4	44.3	88	3	0.03	111724 0170	176,70
1.8	36	43.2	0.4	42.1	88	3	0.03	111724 0180	176,70
1.9	38	45.6	0.4	39.8	88	3	0.03	111724 0190	176,70
2	40	48	0.4	44.6	95	3	0.04	111724 0200	176,70

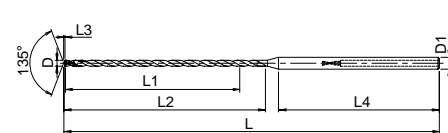
1107

**ADO-MICRO 30xD**

- Point angle 135°
- Cutting tolerance: 0 to -0.009mm

D mm	L1 mm	L2 mm	L3 mm	L4 mm	L mm	D1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1	30	34	0.2	38.8	77	3	0.02	<b>111725 0100</b>	<b>232,70</b>
1.1	33	37.4	0.2	44.6	86	3	0.02	111725 0110	232,70
1.2	36	40.8	0.2	41.3	86	3	0.02	111725 0120	232,70
1.3	39	44.2	0.3	38.1	86	3	0.02	111725 0130	232,70
1.4	42	47.6	0.3	43.9	95	3	0.02	111725 0140	232,70
1.5	45	51	0.3	40.7	95	3	0.03	111725 0150	232,70
1.6	48	54.4	0.3	43.5	101	3	0.03	111725 0160	232,70
1.7	51	57.8	0.4	40.3	101	3	0.03	111725 0170	232,70
1.8	54	61.2	0.4	43.1	107	3	0.03	111725 0180	232,70
1.9	57	64.6	0.4	39.8	107	3	0.03	111725 0190	232,70
2	60	68	0.4	41.6	112	3	0.04	111725 0200	232,70

1107





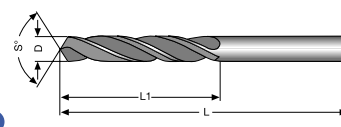
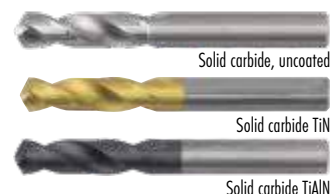
# ATORN® Solid carbide twist drill bit

VHM
DIN 6539
Typ N
118°
32°
3xD
TiN
TiAlN
i Vc/tz
372
373

- Robust twist drill bit for automated units/revolving lathes
- Facet-ground

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
111005....	●	80	50-70	50	25	25		80-90	70-80	15-20			150-200	120-150	70-120		○			20
111008....	●	79-92	58-79	58	27	27		83-98	92	17-23			240	150	136-205		○			23
111009....	●	91-104	78-91	78	32	32		104-117	91-104	20-26	○	20	260	156	140-210		○			26

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€	TiN art.no.	€	TiAlN art.no.	€
0.5	20	3	0.02	111005 0005	5,30	111008 0005	7,75	111009 0005	8,30
0.6	21	3.5	0.02	111005 0006	5,30	111008 0006	7,75	111009 0006	8,30
0.7	23	4.5	0.02	111005 0007	5,30	111008 0007	7,75	111009 0007	8,30
0.8	24	5	0.02	111005 0008	5,30	111008 0008	7,75	111009 0008	8,30
0.9	25	5.5	0.02	111005 0009	5,30	111008 0009	7,75	111009 0009	8,30
1	26	6	0.03	111005 0010	5,30	111008 0010	7,75	111009 0010	8,30
1.1	28	7	0.03	111005 0011	5,30	111008 0011	7,75	111009 0011	8,30
1.2	30	8	0.03	111005 0012	5,30	111008 0012	7,75	111009 0012	8,30
1.3	30	8	0.03	111005 0013	5,30	111008 0013	7,75	111009 0013	8,30
1.4	32	9	0.05	111005 0014	5,30	111008 0014	7,75	111009 0014	8,30
1.5	32	9	0.05	111005 0015	5,30	111008 0015	7,75	111009 0015	8,30
1.6	34	10	0.06	111005 0016	5,30	111008 0016	7,75	111009 0016	8,30
1.7	34	10	0.06	111005 0017	5,30	111008 0017	7,75	111009 0017	8,30
1.8	36	11	0.06	111005 0018	5,30	111008 0018	7,75	111009 0018	8,30
1.9	36	11	0.06	111005 0019	5,30	111008 0019	7,75	111009 0019	8,30
2	38	12	0.06	111005 0020	5,90	111008 0020	8,45	111009 0020	10,-
2.1	38	12	0.07	111005 0021	5,90	111008 0021	8,45	111009 0021	10,-
2.2	40	13	0.07	111005 0022	5,90	111008 0022	8,45	111009 0022	10,-
2.3	40	13	0.07	111005 0023	5,90	111008 0023	8,45	111009 0023	10,-
2.4	43	14	0.07	111005 0024	5,90	111008 0024	8,45	111009 0024	10,-
2.5	43	14	0.07	111005 0025	5,90	111008 0025	8,45	111009 0025	10,-
2.6	43	14	0.08	111005 0026	5,90	111008 0026	8,45	111009 0026	10,-
2.7	46	16	0.08	111005 0027	8,10	111008 0027	10,55	111009 0027	11,25
2.8	46	16	0.08	111005 0028	8,10	111008 0028	10,55	111009 0028	11,25
2.9	46	16	0.08	111005 0029	8,10	111008 0029	10,55	111009 0029	11,25
3	46	16	0.09	111005 0030	8,10	111008 0030	10,55	111009 0030	11,25
3.1	49	18	0.09	111005 0031	8,50	111008 0031	11,65	111009 0031	13,95
3.2	49	18	0.09	111005 0032	8,50	111008 0032	11,65	111009 0032	13,95
3.3	49	18	0.09	111005 0033	8,50	111008 0033	11,65	111009 0033	13,95
3.4	52	20	0.09	111005 0034	9,05	111008 0034	12,45	111009 0034	15,25
3.5	52	20	0.09	111005 0035	9,05	111008 0035	12,45	111009 0035	15,25
3.6	52	20	0.09	111005 0036	9,80	111008 0036	13,60	111009 0036	16,05
3.7	52	20	0.09	111005 0037	9,80	111008 0037	13,60	111009 0037	16,05
3.8	55	22	0.09	111005 0038	10,40	111008 0038	14,70	111009 0038	17,30
3.9	55	22	0.09	111005 0039	10,40	111008 0039	14,70	111009 0039	17,30
4	55	22	0.09	111005 0040	10,40	111008 0040	14,70	111009 0040	17,30
4.1	55	22	0.09	111005 0041	11,-	111008 0041	15,50	111009 0041	17,80
4.2	55	22	0.09	111005 0042	11,-	111008 0042	15,50	111009 0042	17,80
4.3	58	24	0.09	111005 0043	11,55	111008 0043	16,25	111009 0043	18,35
4.4	58	24	0.09	111005 0044	11,55	111008 0044	16,25	111009 0044	18,35
4.5	58	24	0.09	111005 0045	11,55	111008 0045	16,25	111009 0045	18,35
4.6	58	24	0.09	111005 0046	11,55	111008 0046	16,25	111009 0046	18,35
4.7	58	24	0.09	111005 0047	12,50	111008 0047	17,70	111009 0047	19,95
				1154		1154		1154	

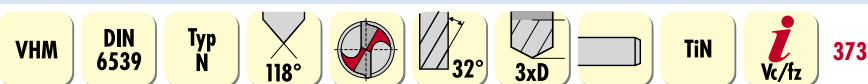
D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	TiN		TiAlN			
				art.no.	€	art.no.	€		
4.8	62	26	0.09	111005 0048	12,50	111008 0048	17,70	111009 0048	19,95
4.9	62	26	0.09	111005 0049	12,50	111008 0049	17,70	111009 0049	19,95
5	62	26	0.09	111005 0050	12,50	111008 0050	17,70	111009 0050	19,95
5.1	62	26	0.09	111005 0051	12,50	111008 0051	17,70	111009 0051	19,95
5.2	62	26	0.09	111005 0052	16,25	111008 0052	22,60	111009 0052	24,70
5.3	62	26	0.09	111005 0053	16,25	111008 0053	22,60	111009 0053	24,70
5.4	66	28	0.09	111005 0054	16,25	111008 0054	22,60	111009 0054	24,70
5.5	66	28	0.10	111005 0055	16,25	111008 0055	22,60	111009 0055	24,70
5.6	66	28	0.10	111005 0056	17,20	111008 0056	24,20	111009 0056	26,90
5.7	66	28	0.10	111005 0057	17,20	111008 0057	24,20	111009 0057	26,90
5.8	66	28	0.10	111005 0058	17,20	111008 0058	24,20	111009 0058	26,90
5.9	66	28	0.10	111005 0059	17,20	111008 0059	24,20	111009 0059	26,90
6	66	28	0.10	111005 0060	17,20	111008 0060	24,20	111009 0060	26,90
6.1	70	31	0.10	111005 0061	20,80	111008 0061	29,20	111009 0061	32,70
6.2	70	31	0.10	111005 0062	20,80	111008 0062	29,20	111009 0062	32,70
6.3	70	31	0.10	111005 0063	20,80	111008 0063	29,20	111009 0063	32,70
6.4	70	31	0.10	111005 0064	20,80	111008 0064	29,20	111009 0064	32,70
6.5	70	31	0.11	111005 0065	20,80	111008 0065	29,20	111009 0065	32,70
6.6	70	31	0.11	111005 0066	24,30	111008 0066	34,40	111009 0066	37,60
6.7	70	31	0.11	111005 0067	24,30	111008 0067	34,40	111009 0067	37,60
6.8	74	34	0.11	111005 0068	24,30	111008 0068	34,40	111009 0068	37,60
6.9	74	34	0.11	111005 0069	24,30	111008 0069	34,40	111009 0069	37,60
7	74	34	0.11	111005 0070	24,30	111008 0070	34,40	111009 0070	37,60
7.1	74	34	0.11	111005 0071	29,30	111008 0071	40,90	111009 0071	42,60
7.2	74	34	0.11	111005 0072	29,30	111008 0072	40,90	111009 0072	42,60
7.3	74	34	0.11	111005 0073	29,30	111008 0073	40,90	111009 0073	42,60
7.4	74	34	0.11	111005 0074	29,30	111008 0074	40,90	111009 0074	42,60
7.5	74	34	0.12	111005 0075	29,30	111008 0075	40,90	111009 0075	42,60
7.6	79	37	0.12	111005 0076	33,20	111008 0076	46,30	111009 0076	46,90
7.7	79	37	0.12	111005 0077	33,20	111008 0077	46,30	111009 0077	46,90
7.8	79	37	0.12	111005 0078	33,20	111008 0078	46,30	111009 0078	46,90
7.9	79	37	0.12	111005 0079	33,20	111008 0079	46,30	111009 0079	46,90
8	79	37	0.12	111005 0080	33,20	111008 0080	46,30	111009 0080	46,90
8.1	79	37	0.12	111005 0081	39,70	111008 0081	52,90	111009 0081	53,-
8.2	79	37	0.12	111005 0082	39,70	111008 0082	52,90	111009 0082	53,-
8.3	79	37	0.12	111005 0083	39,70	111008 0083	52,90	111009 0083	53,-
8.4	79	37	0.13	111005 0084	39,70	111008 0084	52,90	111009 0084	53,-
8.5	79	37	0.13	111005 0085	39,70	111008 0085	52,90	111009 0085	53,-
8.6	84	40	0.13	111005 0086	41,80	111008 0086	56,50	111009 0086	56,80
8.7	84	40	0.13	111005 0087	41,80	111008 0087	56,50	111009 0087	56,80
8.8	84	40	0.13	111005 0088	41,80	111008 0088	56,50	111009 0088	56,80
8.9	84	40	0.13	111005 0089	41,80	111008 0089	56,50	111009 0089	56,80
9	84	40	0.13	111005 0090	41,80	111008 0090	56,50	111009 0090	56,80
9.1	84	40	0.13	111005 0091	45,90	111008 0091	61,70	111009 0091	60,30
9.2	84	40	0.14	111005 0092	45,90	111008 0092	61,70	111009 0092	60,30
9.3	84	40	0.14	111005 0093	45,90	111008 0093	61,70	111009 0093	60,30
9.4	84	40	0.14	111005 0094	45,90	111008 0094	61,70	111009 0094	60,30
9.5	84	40	0.14	111005 0095	45,90	111008 0095	61,70	111009 0095	60,30
9.6	89	43	0.14	111005 0096	47,60	111008 0096	69,40	111009 0096	70,70
9.7	89	43	0.14	111005 0097	47,60	111008 0097	69,40	111009 0097	70,70
9.8	89	43	0.14	111005 0098	47,60	111008 0098	69,40	111009 0098	70,70
9.9	89	43	0.14	111005 0099	47,60	111008 0099	69,40	111009 0099	70,70
10	89	43	0.15	111005 0100	47,60	111008 0100	69,40	111009 0100	70,70
10.2	89	43	0.15	111005 0102	59,80	111008 0102	80,70	111009 0102	80,60
10.5	89	43	0.15	111005 0105	59,80	111008 0105	80,70	111009 0105	80,60
11	95	47	0.16	111005 0110	59,80	111008 0110	80,70	111009 0110	80,60
11.2	95	47	0.16	111005 0112	69,90	111008 0112	102,50	111009 0112	99,50
11.5	95	47	0.16	111005 0115	69,90	111008 0115	102,50	111009 0115	99,50
12	102	51	0.17	111005 0120	69,90	111008 0120	102,50	111009 0120	99,50
12.5	102	51	0.17	111005 0125	91,10	111008 0125	114,-	111009 0125	115,-
13	102	51	0.18	111005 0130	84,30	111008 0130	114,-	111009 0130	115,-
14	107	54	0.19	111005 0140	131,50	111008 0140	166,50	111009 0140	180,50
15	111	56	0.19	111005 0150	148,-	111008 0150	184,50	111009 0150	198,50
16	115	58	0.20	111005 0160	162,-	111008 0160	211,-	111009 0160	239,-

1154

1154

1154

## ATORN® Solid carbide twist drill bit set



- Set supplied in a case
- Diameter 1.0 to 10.0 mm in 1.0 mm increments
- Sturdy twist drill bits for automated units / capstan lathes

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/EPF/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●		●	●	○			●	●	●		○		
		79-92	58-79	58	27	27		83-98	92	17-23			240	150	136-205		23		

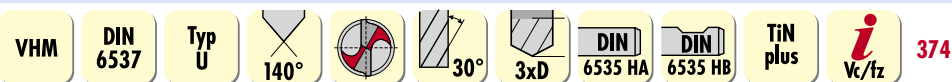
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Number of drills	art.no.	€
1.0 to 10.0 mm in 1.0 mm increments	10	111008 1001	314,-

1154

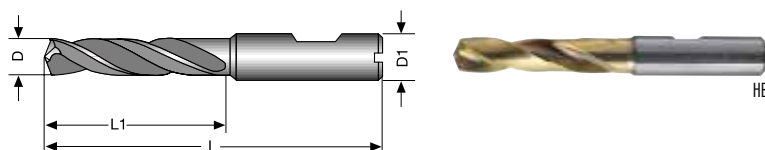
## SARA® TiNplus HPC 3D solid carbide high-performance drill bit without internal cooling



- Newly developed geometry with reinforced core and special point thinning
- **Solid carbide ultra-fine grain cutting material TiNplus** (TiAlN+TiN)
- Modern multi-layer hard coating for maximum service life and optimum chip transport
- High centring accuracy
- **For universal applications**
- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- Shank designs up to Ø 2.9 mm HA, from Ø 3.0 mm HB

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/EPF/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●	●	●	○	○			●	●	○		○	○	
		110-130	95-100	50-75	40-50	40	27	110-140	110	32-36	27	22	230	160	110		35-50	22-32	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
1	4	45	7	0.03	111503 0010	36,20
1.1	4	45	7	0.03	111503 0011	36,20
1.2	4	45	7	0.03	111503 0012	36,20
1.3	4	45	7	0.03	111503 0013	36,20
1.4	4	45	7	0.04	111503 0014	36,20
1.5	4	55	14	0.04	111503 0015	36,20
1.6	4	55	14	0.04	111503 0016	36,20
1.7	4	55	14	0.04	111503 0017	36,20
1.8	4	55	14	0.05	111503 0018	36,20
1.9	4	55	14	0.05	111503 0019	36,20
2	4	55	20	0.05	111503 0020	36,20
2.1	4	55	20	0.05	111503 0021	36,20
2.2	4	55	20	0.06	111503 0022	36,20
2.3	4	55	20	0.06	111503 0023	36,20

1156

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2.4	4	55	20	0.06	111503 0024	36,20
2.5	4	55	20	0.06	111503 0025	36,20
2.6	4	55	20	0.07	111503 0026	36,20
2.7	4	55	20	0.07	111503 0027	36,20
2.8	4	55	20	0.07	111503 0028	36,20
2.9	4	55	20	0.07	111503 0029	36,20
3	6	62	20	0.06	111503 0030	28,60
3.1	6	62	20	0.06	111503 0031	28,60
3.2	6	62	20	0.06	111503 0032	28,60
3.25	6	62	20	0.07	111503 0325	28,60
3.3	6	62	20	0.07	111503 0033	28,60
3.4	6	62	20	0.07	111503 0034	28,60
3.5	6	62	20	0.07	111503 0035	28,60
3.6	6	62	20	0.07	111503 0036	28,60

1156

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3.7	6	62	20	0.07	111503 0037	28,60
3.8	6	66	24	0.08	111503 0038	28,60
3.9	6	66	24	0.08	111503 0039	28,60
4	6	66	24	0.08	111503 0040	28,60
4.1	6	66	24	0.08	111503 0041	28,60
4.2	6	66	24	0.08	111503 0042	28,60
4.3	6	66	24	0.09	111503 0043	28,60
4.4	6	66	24	0.09	111503 0044	28,60
4.5	6	66	24	0.09	111503 0045	28,60
4.6	6	66	24	0.09	111503 0046	28,60
4.65	6	66	24	0.09	111503 0465	28,60
4.7	6	66	24	0.09	111503 0047	28,60
4.8	6	66	28	0.10	111503 0048	28,60
4.9	6	66	28	0.10	111503 0049	28,60
5	6	66	28	0.10	111503 0050	28,60
5.1	6	66	28	0.10	111503 0051	28,60
5.2	6	66	28	0.10	111503 0052	28,60
5.3	6	66	28	0.11	111503 0053	28,60
5.4	6	66	28	0.11	111503 0054	28,60
5.5	6	66	28	0.11	111503 0055	28,60
5.55	6	66	28	0.11	111503 0555	28,60
5.6	6	66	28	0.11	111503 0056	28,60
5.7	6	66	28	0.11	111503 0057	28,60
5.8	6	66	28	0.12	111503 0058	28,60
5.9	6	66	28	0.12	111503 0059	28,60
6	6	66	28	0.12	111503 0060	28,60
6.1	8	79	34	0.12	111503 0061	29,40
6.2	8	79	34	0.12	111503 0062	29,40
6.3	8	79	34	0.13	111503 0063	29,40
6.4	8	79	34	0.13	111503 0064	29,40
6.5	8	79	34	0.13	111503 0065	29,40
6.6	8	79	34	0.13	111503 0066	29,40
6.7	8	79	34	0.13	111503 0067	29,40
6.8	8	79	34	0.14	111503 0068	29,40
6.9	8	79	34	0.14	111503 0069	29,40
7	8	79	34	0.14	111503 0070	29,40
7.1	8	79	41	0.14	111503 0071	29,40
7.2	8	79	41	0.14	111503 0072	29,40
7.3	8	79	41	0.15	111503 0073	29,40
7.4	8	79	41	0.15	111503 0074	29,40
7.5	8	79	41	0.15	111503 0075	29,40
7.6	8	79	41	0.15	111503 0076	29,40
7.7	8	79	41	0.15	111503 0077	29,40
7.8	8	79	41	0.16	111503 0078	29,40
7.9	8	79	41	0.16	111503 0079	29,40
8	8	79	41	0.16	111503 0080	29,40
8.1	10	89	47	0.16	111503 0081	34,60
8.2	10	89	47	0.16	111503 0082	34,60

1156

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
8.3	10	89	47	0.17	111503 0083	34,60
8.4	10	89	47	0.17	111503 0084	34,60
8.5	10	89	47	0.17	111503 0085	34,60
8.6	10	89	47	0.17	111503 0086	34,60
8.7	10	89	47	0.17	111503 0087	34,60
8.8	10	89	47	0.18	111503 0088	34,60
8.9	10	89	47	0.18	111503 0089	34,60
9	10	89	47	0.18	111503 0090	34,60
9.1	10	89	47	0.18	111503 0091	34,60
9.2	10	89	47	0.18	111503 0092	34,60
9.3	10	89	47	0.19	111503 0093	34,60
9.4	10	89	47	0.19	111503 0094	34,60
9.5	10	89	47	0.19	111503 0095	34,60
9.6	10	89	47	0.19	111503 0096	34,60
9.7	10	89	47	0.19	111503 0097	34,60
9.8	10	89	47	0.20	111503 0098	34,60
9.9	10	89	47	0.20	111503 0099	34,60
10	10	89	47	0.20	111503 0100	34,60
10.2	12	102	55	0.20	111503 0102	48,20
10.3	12	102	55	0.21	111503 0103	48,20
10.5	12	102	55	0.21	111503 0105	48,20
10.8	12	102	55	0.22	111503 0108	48,20
11	12	102	55	0.22	111503 0110	48,20
11.2	12	102	55	0.22	111503 0112	48,20
11.5	12	102	55	0.23	111503 0115	48,20
11.8	12	102	55	0.24	111503 0118	48,20
12	12	102	55	0.24	111503 0120	48,20
12.5	14	107	60	0.25	111503 0125	67,90
12.8	14	107	60	0.26	111503 0128	67,90
13	14	107	60	0.26	111503 0130	67,90
13.5	14	107	60	0.27	111503 0135	67,90
13.8	14	107	60	0.28	111503 0138	67,90
14	14	107	60	0.28	111503 0140	67,90
14.2	16	115	65	0.28	111503 0142	87,40
14.5	16	115	65	0.29	111503 0145	87,40
14.8	16	115	65	0.30	111503 0148	87,40
15	16	115	65	0.30	111503 0150	87,40
15.5	16	115	65	0.31	111503 0155	87,40
15.8	16	115	65	0.32	111503 0158	87,40
16	16	115	65	0.32	111503 0160	87,40
16.5	18	123	73	0.33	111503 0165	139,50
17	18	123	73	0.34	111503 0170	139,50
17.5	18	123	73	0.35	111503 0175	139,50
18	18	123	73	0.36	111503 0180	139,50
18.5	20	131	79	0.37	111503 0185	168,-
19	20	131	79	0.38	111503 0190	168,-
19.5	20	131	79	0.39	111503 0195	168,-
20	20	131	79	0.40	111503 0200	168,-

1156



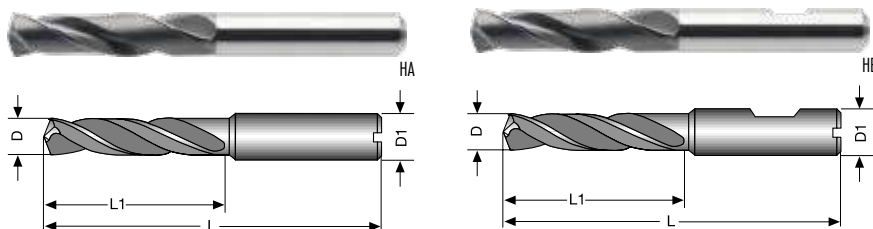
# ATORN® TiAlNplus HPC 3D solid carbide high-performance drill bit without internal cooling

VHM
DIN 6537
Typ U
140°
30°
3xD
DIN 6535 HA
DIN 6535 HB
TiAlNplus
i Vc/tz
375

- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **Cutting material: Solid carbide ultra-fine grain TiAlNplus**
- Efficient drilling in different materials
- Newly developed geometry in conjunction with a customised multilayer coating for enhanced performance
- Special cutting edge finishing reduces micro-nicks and increases service life

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		110-145	85-110	55-85	40	45	30	125-155	120	35-40	30	25	260	180	125		40-55	25-35	25

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7	D1 h6	L	L1	Feed f	HA	HB
mm	mm	mm	mm	steel < 1000 N/mm² mm/rev	art.no.	art.no.
1	4	45	7	0.03	111562 0100	45,-
1.1	4	45	7	0.03	111562 0110	45,-
1.2	4	45	7	0.03	111562 0120	45,-
1.3	4	45	7	0.03	111562 0130	45,-
1.4	4	45	7	0.04	111562 0140	45,-
1.5	4	55	14	0.04	111562 0150	45,-
1.6	4	55	14	0.04	111562 0160	45,-
1.7	4	55	14	0.04	111562 0170	45,-
1.8	4	55	14	0.05	111562 0180	45,-
1.9	4	55	14	0.05	111562 0190	45,-
2	4	55	20	0.05	111562 0200	45,-
2.1	4	55	20	0.05	111562 0210	45,-
2.2	4	55	20	0.06	111562 0220	45,-
2.3	4	55	20	0.06	111562 0230	45,-
2.4	4	55	20	0.06	111562 0240	45,-
2.5	4	55	20	0.06	111562 0250	45,-
2.6	4	55	20	0.07	111562 0260	45,-
2.7	4	55	20	0.07	111562 0270	45,-
2.8	4	55	20	0.07	111562 0280	45,-
2.9	4	55	20	0.07	111562 0290	45,-
3	6	62	20	0.08	111562 0300	111563 0300 45,-
3.1	6	62	20	0.08	111562 0310	111563 0310 45,-
3.2	6	62	20	0.08	111562 0320	111563 0320 45,-
3.25	6	62	20	0.08	111562 0325	111563 0325 45,-
3.3	6	62	20	0.08	111562 0330	111563 0330 45,-
3.4	6	62	20	0.09	111562 0340	111563 0340 45,-
3.5	6	62	20	0.09	111562 0350	111563 0350 45,-
3.6	6	62	20	0.09	111562 0360	111563 0360 45,-
3.7	6	62	20	0.09	111562 0370	111563 0370 45,-
3.8	6	66	24	0.10	111562 0380	111563 0380 45,-
3.9	6	66	24	0.10	111562 0390	111563 0390 45,-
4	6	66	24	0.10	111562 0400	111563 0400 45,-
4.1	6	66	24	0.10	111562 0410	111563 0410 46,20
4.2	6	66	24	0.11	111562 0420	111563 0420 46,20
4.3	6	66	24	0.11	111562 0430	111563 0430 46,20
4.4	6	66	24	0.11	111562 0440	111563 0440 46,20
4.5	6	66	24	0.11	111562 0450	111563 0450 46,20

D h7	D1 h6	L	L1	Feed f	HA	HB
mm	mm	mm	mm	steel < 1000 N/mm² mm/rev	art.no.	art.no.
4.6	6	66	24	0.12	111562 0460	111563 0460 46,20
4.65	6	66	24	0.12	111562 0465	111563 0465 46,20
4.7	6	66	24	0.12	111562 0470	111563 0470 46,20
4.8	6	66	28	0.12	111562 0480	111563 0480 46,20
4.9	6	66	28	0.12	111562 0490	111563 0490 46,20
5	6	66	28	0.13	111562 0500	111563 0500 46,20
5.1	6	66	28	0.13	111562 0510	111563 0510 46,20
5.2	6	66	28	0.13	111562 0520	111563 0520 46,20
5.3	6	66	28	0.13	111562 0530	111563 0530 46,20
5.4	6	66	28	0.14	111562 0540	111563 0540 46,20
5.5	6	66	28	0.14	111562 0550	111563 0550 46,20
5.55	6	66	28	0.14	111562 0555	111563 0555 46,20
5.6	6	66	28	0.14	111562 0560	111563 0560 46,20
5.65	6	66	28	0.14	111562 0565	111563 0565 46,20
5.7	6	66	28	0.14	111562 0570	111563 0570 46,20
5.8	6	66	28	0.15	111562 0580	111563 0580 46,20
5.9	6	66	28	0.15	111562 0590	111563 0590 46,20
6	6	66	28	0.15	111562 0600	111563 0600 46,20
6.1	8	79	34	0.15	111562 0610	111563 0610 46,80
6.2	8	79	34	0.16	111562 0620	111563 0620 46,80
6.3	8	79	34	0.16	111562 0630	111563 0630 46,80
6.4	8	79	34	0.16	111562 0640	111563 0640 46,80
6.5	8	79	34	0.16	111562 0650	111563 0650 46,80
6.6	8	79	34	0.17	111562 0660	111563 0660 46,80
6.7	8	79	34	0.17	111562 0670	111563 0670 46,80
6.8	8	79	34	0.17	111562 0680	111563 0680 46,80
6.9	8	79	34	0.17	111562 0690	111563 0690 46,80
7	8	79	34	0.18	111562 0700	111563 0700 46,80
7.1	8	79	41	0.18	111562 0710	111563 0710 46,80
7.2	8	79	41	0.18	111562 0720	111563 0720 46,80
7.3	8	79	41	0.18	111562 0730	111563 0730 46,80
7.4	8	79	41	0.19	111562 0740	111563 0740 46,80
7.5	8	79	41	0.19	111562 0750	111563 0750 46,80
7.55	8	79	41	0.19	111562 0755	111563 0755 46,80
7.6	8	79	41	0.19	111562 0760	111563 0760 46,80
7.65	8	79	41	0.19	111562 0765	111563 0765 46,80
7.7	8	79	41	0.19	111562 0770	111563 0770 46,80

1111

1111

1111

1111

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA art.no.	€	HB art.no.	€
7.8	8	79	41	0.20	111562 0780	46,80	111563 0780	46,80
7.9	8	79	41	0.20	111562 0790	46,80	111563 0790	46,80
8	8	79	41	0.20	111562 0800	46,80	111563 0800	46,80
8.1	10	89	47	0.20	111562 0810	52,90	111563 0810	52,90
8.2	10	89	47	0.21	111562 0820	52,90	111563 0820	52,90
8.3	10	89	47	0.21	111562 0830	52,90	111563 0830	52,90
8.4	10	89	47	0.21	111562 0840	52,90	111563 0840	52,90
8.5	10	89	47	0.21	111562 0850	52,90	111563 0850	52,90
8.6	10	89	47	0.22	111562 0860	52,90	111563 0860	52,90
8.7	10	89	47	0.22	111562 0870	52,90	111563 0870	52,90
8.8	10	89	47	0.22	111562 0880	52,90	111563 0880	52,90
8.9	10	89	47	0.22	111562 0890	52,90	111563 0890	52,90
9	10	89	47	0.23	111562 0900	52,90	111563 0900	52,90
9.1	10	89	47	0.23	111562 0910	52,90	111563 0910	52,90
9.2	10	89	47	0.23	111562 0920	52,90	111563 0920	52,90
9.3	10	89	47	0.23	111562 0930	52,90	111563 0930	52,90
9.4	10	89	47	0.24	111562 0940	52,90	111563 0940	52,90
9.5	10	89	47	0.24	111562 0950	52,90	111563 0950	52,90
9.6	10	89	47	0.24	111562 0960	52,90	111563 0960	52,90
9.7	10	89	47	0.24	111562 0970	52,90	111563 0970	52,90
9.8	10	89	47	0.25	111562 0980	52,90	111563 0980	52,90
9.9	10	89	47	0.25	111562 0990	52,90	111563 0990	52,90
10	10	89	47	0.25	111562 1000	52,90	111563 1000	52,90
10.1	12	102	55	0.25	111562 1010	78,40	111563 1010	78,40
10.2	12	102	55	0.26	111562 1020	78,40	111563 1020	78,40
10.3	12	102	55	0.26	111562 1030	78,40	111563 1030	78,40
10.4	12	102	55	0.26	111562 1040	78,40	111563 1040	78,40
10.5	12	102	55	0.26	111562 1050	78,40	111563 1050	78,40
10.6	12	102	55	0.27	111562 1060	78,40	111563 1060	78,40
10.7	12	102	55	0.27	111562 1070	78,40	111563 1070	78,40
10.8	12	102	55	0.27	111562 1080	78,40	111563 1080	78,40
10.9	12	102	55	0.27	111562 1090	78,40	111563 1090	78,40
11	12	102	55	0.28	111562 1100	78,40	111563 1100	78,40
11.1	12	102	55	0.28	111562 1110	78,40	111563 1110	78,40
11.2	12	102	55	0.28	111562 1120	78,40	111563 1120	78,40

1111

1111

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA art.no.	€	HB art.no.	€
11.3	12	102	55	0.28	111562 1130	78,40	111563 1130	78,40
11.4	12	102	55	0.29	111562 1140	78,40	111563 1140	78,40
11.5	12	102	55	0.29	111562 1150	78,40	111563 1150	78,40
11.6	12	102	55	0.29	111562 1160	78,40	111563 1160	78,40
11.7	12	102	55	0.29	111562 1170	78,40	111563 1170	78,40
11.8	12	102	55	0.30	111562 1180	78,40	111563 1180	78,40
11.9	12	102	55	0.30	111562 1190	78,40	111563 1190	78,40
12	12	102	55	0.30	111562 1200	78,40	111563 1200	78,40
12.2	14	107	60	0.31	111562 1220	104,-	111563 1220	104,-
12.5	14	107	60	0.31	111562 1250	104,-	111563 1250	104,-
12.8	14	107	60	0.32	111562 1280	104,-	111563 1280	104,-
13	14	107	60	0.33	111562 1300	104,-	111563 1300	104,-
13.1	14	107	60	0.33	111562 1310	104,-	111563 1310	104,-
13.5	14	107	60	0.34	111562 1350	104,-	111563 1350	104,-
13.8	14	107	60	0.35	111562 1380	104,-	111563 1380	104,-
14	14	107	60	0.35	111562 1400	104,-	111563 1400	104,-
14.2	16	115	65	0.36	111562 1420	130,50	111563 1420	130,50
14.4	16	115	65	0.36	111562 1440	130,50	111563 1440	130,50
14.5	16	115	65	0.36	111562 1450	130,50	111563 1450	130,50
14.8	16	115	65	0.37	111562 1480	130,50	111563 1480	130,50
15	16	115	65	0.38	111562 1500	130,50	111563 1500	130,50
15.1	16	115	65	0.38	111562 1510	130,50	111563 1510	130,50
15.2	16	115	65	0.38	111562 1520	130,50	111563 1520	130,50
15.5	16	115	65	0.39	111562 1550	130,50	111563 1550	130,50
15.8	16	115	65	0.40	111562 1580	130,50	111563 1580	130,50
16	16	115	65	0.40	111562 1600	130,50	111563 1600	130,50
16.5	18	123	73	0.41	111562 1650	199,50	111563 1650	199,50
17	18	123	73	0.43	111562 1700	199,50	111563 1700	199,50
17.5	18	123	73	0.44	111562 1750	199,50	111563 1750	199,50
18	18	123	73	0.45	111562 1800	199,50	111563 1800	199,50
18.5	20	131	79	0.46	111562 1850	249,-	111563 1850	249,-
18.9	20	131	79	0.47	111562 1890	249,-	111563 1890	249,-
19	20	131	79	0.48	111562 1900	249,-	111563 1900	249,-
19.5	20	131	79	0.49	111562 1950	249,-	111563 1950	249,-
20	20	131	79	0.50	111562 2000	249,-	111563 2000	249,-

1111

1111



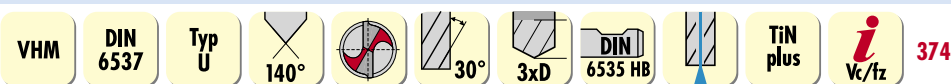
Drilling and turning ...

... with a single tool.

**ATORN**<sup>®</sup>  
Performance demands quality



# SARA® TiNplus HPC 3D solid carbide high-performance drill bit with internal cooling



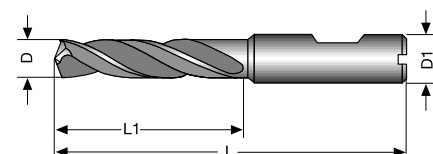
- Newly developed geometry with reinforced core and special point thinning
- **Solid carbide ultra-fine grain cutting material TiNplus** (TiAlN+TiN)
- Modern multi-layer hard coating for maximum service life and optimum chip transport
- High centring accuracy
- **For universal applications**
- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **With internal cooling**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		110-150	75-110	60-95	40	50	40	145	110	36-40	36	32	230-280	200	110	50	32		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



HB with coolant bore



D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	6	62	20	0.11	111507 0030	38,70
3.1	6	62	20	0.11	111507 0031	38,70
3.2	6	62	20	0.11	111507 0032	38,70
3.25	6	62	20	0.11	111507 0325	38,70
3.3	6	62	20	0.11	111507 0033	38,70
3.4	6	62	20	0.11	111507 0034	38,70
3.5	6	62	20	0.16	111507 0035	38,70
3.6	6	62	20	0.16	111507 0036	38,70
3.7	6	62	20	0.16	111507 0037	38,70
3.8	6	66	24	0.16	111507 0038	38,70
3.9	6	66	24	0.16	111507 0039	38,70
4	6	66	24	0.16	111507 0040	38,70
4.1	6	66	24	0.16	111507 0041	38,70
4.2	6	66	24	0.16	111507 0042	38,70
4.3	6	66	24	0.16	111507 0043	38,70
4.4	6	66	24	0.16	111507 0044	38,70
4.5	6	66	24	0.16	111507 0045	38,70
4.6	6	66	24	0.16	111507 0046	38,70
4.65	6	66	24	0.16	111507 0465	38,70
4.7	6	66	24	0.16	111507 0047	38,70
4.8	6	66	28	0.16	111507 0048	38,70
4.9	6	66	28	0.16	111507 0049	38,70
5	6	66	28	0.16	111507 0050	38,70
5.1	6	66	28	0.16	111507 0051	38,70
5.2	6	66	28	0.16	111507 0052	38,70
5.3	6	66	28	0.16	111507 0053	38,70
5.4	6	66	28	0.16	111507 0054	38,70
5.5	6	66	28	0.20	111507 0055	38,70
5.55	6	66	28	0.20	111507 0555	38,70
5.6	6	66	28	0.20	111507 0056	38,70
5.7	6	66	28	0.20	111507 0057	38,70
5.8	6	66	28	0.20	111507 0058	38,70
5.9	6	66	28	0.20	111507 0059	38,70
6	6	66	28	0.20	111507 0060	38,70
6.1	8	79	34	0.20	111507 0061	49,90
6.2	8	79	34	0.20	111507 0062	49,90

1156

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
6.3	8	79	34	0.20	111507 0063	49,90
6.4	8	79	34	0.20	111507 0064	49,90
6.5	8	79	34	0.20	111507 0065	49,90
6.6	8	79	34	0.20	111507 0066	49,90
6.7	8	79	34	0.20	111507 0067	49,90
6.8	8	79	34	0.20	111507 0068	49,90
6.9	8	79	34	0.20	111507 0069	49,90
7	8	79	34	0.20	111507 0070	49,90
7.1	8	79	41	0.25	111507 0071	49,90
7.2	8	79	41	0.25	111507 0072	49,90
7.3	8	79	41	0.25	111507 0073	49,90
7.4	8	79	41	0.25	111507 0074	49,90
7.5	8	79	41	0.25	111507 0075	49,90
7.6	8	79	41	0.25	111507 0076	49,90
7.7	8	79	41	0.25	111507 0077	49,90
7.8	8	79	41	0.25	111507 0078	49,90
7.9	8	79	41	0.25	111507 0079	49,90
8	8	79	41	0.25	111507 0080	49,90
8.1	10	89	47	0.25	111507 0081	58,90
8.2	10	89	47	0.25	111507 0082	58,90
8.3	10	89	47	0.25	111507 0083	58,90
8.4	10	89	47	0.25	111507 0084	58,90
8.5	10	89	47	0.25	111507 0085	58,90
8.6	10	89	47	0.25	111507 0086	58,90
8.7	10	89	47	0.25	111507 0087	58,90
8.8	10	89	47	0.25	111507 0088	58,90
8.9	10	89	47	0.25	111507 0089	58,90
9	10	89	47	0.25	111507 0090	58,90
9.1	10	89	47	0.32	111507 0091	58,90
9.2	10	89	47	0.32	111507 0092	58,90
9.3	10	89	47	0.32	111507 0093	58,90
9.4	10	89	47	0.32	111507 0094	58,90
9.5	10	89	47	0.32	111507 0095	58,90
9.6	10	89	47	0.32	111507 0096	58,90
9.7	10	89	47	0.32	111507 0097	58,90
9.8	10	89	47	0.32	111507 0098	58,90

1156

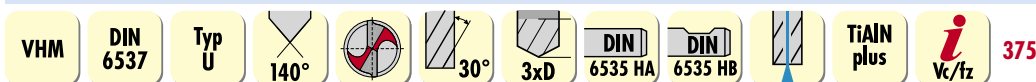
D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
9.9	10	89	47	0.32	111507 0099	58,90
10	10	89	47	0.32	111507 0100	58,90
10.2	12	102	55	0.32	111507 0102	86,50
10.3	12	102	55	0.32	111507 0103	86,50
10.5	12	102	55	0.32	111507 0105	86,50
10.8	12	102	55	0.32	111507 0108	86,50
11	12	102	55	0.32	111507 0110	86,50
11.2	12	102	55	0.32	111507 0112	86,50
11.5	12	102	55	0.32	111507 0115	86,50
11.8	12	102	55	0.32	111507 0118	86,50
12	12	102	55	0.32	111507 0120	86,50
12.5	14	107	60	0.32	111507 0125	114,50
12.8	14	107	60	0.32	111507 0128	114,50
13	14	107	60	0.32	111507 0130	114,50
13.5	14	107	60	0.32	111507 0135	114,50
13.8	14	107	60	0.32	111507 0138	114,50

1156

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
14	14	107	60	0.32	111507 0140	114,50
14.2	16	115	65	0.32	111507 0142	114,50
14.5	16	115	65	0.32	111507 0145	142,-
14.8	16	115	65	0.32	111507 0148	142,-
15	16	115	65	0.32	111507 0150	142,-
15.5	16	115	65	0.40	111507 0155	142,-
15.8	16	115	65	0.40	111507 0158	142,-
16	16	115	65	0.40	111507 0160	142,-
16.5	18	123	73	0.40	111507 0165	194,50
17	18	123	73	0.40	111507 0170	194,50
17.5	18	123	73	0.40	111507 0175	194,50
18	18	123	73	0.40	111507 0180	194,50
18.5	20	131	79	0.50	111507 0185	242,-
19	20	131	79	0.50	111507 0190	242,-
19.5	20	131	79	0.50	111507 0195	242,-
20	20	131	79	0.50	111507 0200	242,-

1156

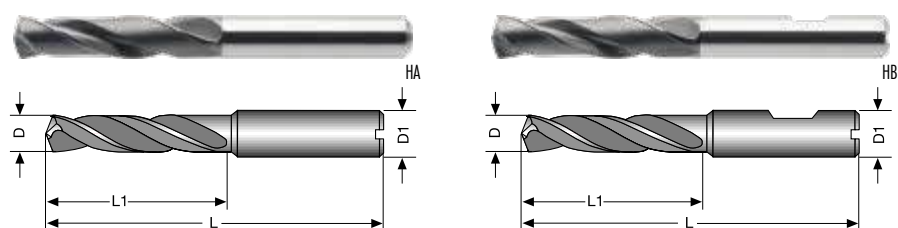
### ATORN® TiAlNplus HPC 3D solid carbide high-performance drill bit with internal cooling



- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **Cutting material: Solid carbide ultra-fine grain TiAlNplus**
- Efficient drilling in different materials
- Newly developed geometry in conjunction with a customised multilayer coating for enhanced performance
- Special cutting edge finishing reduces micro-nicks and increases service life
- **With internal cooling**

material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG			< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	○	○
	120-170	85-120	65-105	45	55	44	160	120	40-45	40	35	260-310	220	125			55	35	30

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA art.no.	€	HB art.no.	€
1	4	45	7	0.03	111564 0100	59,-		
1.1	4	45	7	0.03	111564 0110	59,-		
1.2	4	45	7	0.03	111564 0120	59,-		
1.3	4	45	7	0.03	111564 0130	59,-		
1.4	4	45	7	0.04	111564 0140	59,-		
1.5	4	55	14	0.04	111564 0150	59,-		
1.6	4	55	14	0.04	111564 0160	59,-		
1.7	4	55	14	0.04	111564 0170	59,-		
1.8	4	55	14	0.05	111564 0180	59,-		
1.9	4	55	14	0.05	111564 0190	59,-		
2	4	55	20	0.05	111564 0200	59,-		
2.1	4	55	20	0.05	111564 0210	59,-		
2.2	4	55	20	0.06	111564 0220	59,-		
2.3	4	55	20	0.06	111564 0230	59,-		
2.4	4	55	20	0.06	111564 0240	59,-		
2.5	4	55	20	0.06	111564 0250	59,-		

1111

1111

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA art.no.	€	HB art.no.	€
2.6	4	55	20	0.07	111564 0260	59,-		
2.7	4	55	20	0.07	111564 0270	59,-		
2.8	4	55	20	0.07	111564 0280	59,-		
2.9	4	55	20	0.07	111564 0290	59,-		
3	6	62	20	0.08	111564 0300	59,-	111565 0300	59,-
3.1	6	62	20	0.08	111564 0310	62,10	111565 0310	62,10
3.2	6	62	20	0.08	111564 0320	62,10	111565 0320	62,10
3.25	6	62	20	0.08	111564 0325	62,10	111565 0325	62,10
3.3	6	62	20	0.08	111564 0330	62,10	111565 0330	62,10
3.4	6	62	20	0.09	111564 0340	62,10	111565 0340	62,10
3.5	6	62	20	0.09	111564 0350	62,10	111565 0350	62,10
3.6	6	62	20	0.09	111564 0360	62,10	111565 0360	62,10
3.7	6	62	20	0.09	111564 0370	62,10	111565 0370	62,10
3.8	6	66	24	0.10	111564 0380	62,10	111565 0380	62,10
3.9	6	66	24	0.10	111564 0390	62,10	111565 0390	62,10
4	6	66	24	0.10	111564 0400	62,10	111565 0400	62,10

1111

1111

Continued on next page >>>

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA		HB	
					art.no.	€	art.no.	€
4.1	6	66	24	0.10	111564 0410	62,10	111565 0410	62,10
4.2	6	66	24	0.11	111564 0420	62,10	111565 0420	62,10
4.3	6	66	24	0.11	111564 0430	62,10	111565 0430	62,10
4.4	6	66	24	0.11	111564 0440	62,10	111565 0440	62,10
4.5	6	66	24	0.11	111564 0450	62,10	111565 0450	62,10
4.6	6	66	24	0.12	111564 0460	62,10	111565 0460	62,10
4.65	6	66	24	0.12	111564 0465	62,10	111565 0465	62,10
4.7	6	66	24	0.12	111564 0470	62,10	111565 0470	62,10
4.8	6	66	28	0.12	111564 0480	62,10	111565 0480	62,10
4.9	6	66	28	0.12	111564 0490	62,10	111565 0490	62,10
5	6	66	28	0.13	111564 0500	62,10	111565 0500	62,10
5.1	6	66	28	0.13	111564 0510	62,10	111565 0510	62,10
5.2	6	66	28	0.13	111564 0520	62,10	111565 0520	62,10
5.3	6	66	28	0.13	111564 0530	62,10	111565 0530	62,10
5.4	6	66	28	0.14	111564 0540	62,10	111565 0540	62,10
5.5	6	66	28	0.14	111564 0550	62,10	111565 0550	62,10
5.55	6	66	28	0.14	111564 0555	62,10	111565 0555	62,10
5.6	6	66	28	0.14	111564 0560	62,10	111565 0560	62,10
5.65	6	66	28	0.14	111564 0565	62,10	111565 0565	62,10
5.7	6	66	28	0.14	111564 0570	62,10	111565 0570	62,10
5.8	6	66	28	0.15	111564 0580	62,10	111565 0580	62,10
5.9	6	66	28	0.15	111564 0590	62,10	111565 0590	62,10
6	6	66	28	0.15	111564 0600	62,10	111565 0600	62,10
6.1	8	79	34	0.15	111564 0610	80,40	111565 0610	80,40
6.2	8	79	34	0.16	111564 0620	80,40	111565 0620	80,40
6.3	8	79	34	0.16	111564 0630	80,40	111565 0630	80,40
6.4	8	79	34	0.16	111564 0640	80,40	111565 0640	80,40
6.5	8	79	34	0.16	111564 0650	80,40	111565 0650	80,40
6.6	8	79	34	0.17	111564 0660	80,40	111565 0660	80,40
6.7	8	79	34	0.17	111564 0670	80,40	111565 0670	80,40
6.8	8	79	34	0.17	111564 0680	80,40	111565 0680	80,40
6.9	8	79	34	0.17	111564 0690	80,40	111565 0690	80,40
7	8	79	34	0.18	111564 0700	80,40	111565 0700	80,40
7.1	8	79	41	0.18	111564 0710	80,40	111565 0710	80,40
7.2	8	79	41	0.18	111564 0720	80,40	111565 0720	80,40
7.3	8	79	41	0.18	111564 0730	80,40	111565 0730	80,40
7.4	8	79	41	0.19	111564 0740	80,40	111565 0740	80,40
7.5	8	79	41	0.19	111564 0750	80,40	111565 0750	80,40
7.55	8	79	41	0.19	111564 0755	80,40	111565 0755	80,40
7.6	8	79	41	0.19	111564 0760	80,40	111565 0760	80,40
7.65	8	79	41	0.19	111564 0765	80,40	111565 0765	80,40
7.7	8	79	41	0.19	111564 0770	80,40	111565 0770	80,40
7.8	8	79	41	0.20	111564 0780	80,40	111565 0780	80,40
7.9	8	79	41	0.20	111564 0790	80,40	111565 0790	80,40
8	8	79	41	0.20	111564 0800	80,40	111565 0800	80,40
8.1	10	89	47	0.20	111564 0810	93,60	111565 0810	93,60
8.2	10	89	47	0.21	111564 0820	93,60	111565 0820	93,60
8.3	10	89	47	0.21	111564 0830	93,60	111565 0830	93,60
8.4	10	89	47	0.21	111564 0840	93,60	111565 0840	93,60
8.5	10	89	47	0.21	111564 0850	93,60	111565 0850	93,60
8.6	10	89	47	0.22	111564 0860	93,60	111565 0860	93,60
8.7	10	89	47	0.22	111564 0870	93,60	111565 0870	93,60
8.8	10	89	47	0.22	111564 0880	93,60	111565 0880	93,60
8.9	10	89	47	0.22	111564 0890	93,60	111565 0890	93,60
9	10	89	47	0.23	111564 0900	93,60	111565 0900	93,60
9.1	10	89	47	0.23	111564 0910	93,60	111565 0910	93,60
9.2	10	89	47	0.23	111564 0920	93,60	111565 0920	93,60
9.3	10	89	47	0.23	111564 0930	93,60	111565 0930	93,60

1111

1111

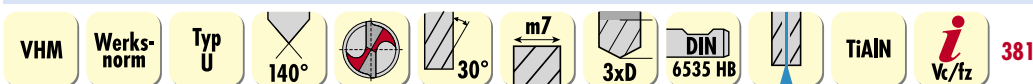
D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA		HB	
					art.no.	€	art.no.	€
9.4	10	89	47	0.24	111564 0940	93,60	111565 0940	93,60
9.5	10	89	47	0.24	111564 0950	93,60	111565 0950	93,60
9.6	10	89	47	0.24	111564 0960	93,60	111565 0960	93,60
9.7	10	89	47	0.24	111564 0970	93,60	111565 0970	93,60
9.8	10	89	47	0.25	111564 0980	93,60	111565 0980	93,60
9.9	10	89	47	0.25	111564 0990	93,60	111565 0990	93,60
10	10	89	47	0.25	111564 1000	93,60	111565 1000	93,60
10.1	12	102	55	0.25	111564 1010	140,50	111565 1010	140,50
10.2	12	102	55	0.26	111564 1020	140,50	111565 1020	140,50
10.3	12	102	55	0.26	111564 1030	140,50	111565 1030	140,50
10.4	12	102	55	0.26	111564 1040	140,50	111565 1040	140,50
10.5	12	102	55	0.26	111564 1050	140,50	111565 1050	140,50
10.6	12	102	55	0.27	111564 1060	140,50	111565 1060	140,50
10.7	12	102	55	0.27	111564 1070	140,50	111565 1070	140,50
10.8	12	102	55	0.27	111564 1080	140,50	111565 1080	140,50
10.9	12	102	55	0.27	111564 1090	140,50	111565 1090	140,50
11	12	102	55	0.28	111564 1100	140,50	111565 1100	140,50
11.1	12	102	55	0.28	111564 1110	140,50	111565 1110	140,50
11.2	12	102	55	0.28	111564 1120	140,50	111565 1120	140,50
11.3	12	102	55	0.28	111564 1130	140,50	111565 1130	140,50
11.4	12	102	55	0.29	111564 1140	140,50	111565 1140	140,50
11.5	12	102	55	0.29	111564 1150	140,50	111565 1150	140,50
11.6	12	102	55	0.29	111564 1160	140,50	111565 1160	140,50
11.7	12	102	55	0.29	111564 1170	140,50	111565 1170	140,50
11.8	12	102	55	0.30	111564 1180	140,50	111565 1180	140,50
11.9	12	102	55	0.30	111564 1190	140,50	111565 1190	140,50
12	12	102	55	0.30	111564 1200	140,50	111565 1200	140,50
12.2	14	107	60	0.31	111564 1220	189,50	111565 1220	189,50
12.3	14	107	60	0.31	111564 1230	189,50	111565 1230	189,50
12.5	14	107	60	0.31	111564 1250	189,50	111565 1250	189,50
12.7	14	107	60	0.32	111564 1270	189,50	111565 1270	189,50
12.8	14	107	60	0.32	111564 1280	189,50	111565 1280	189,50
12.9	14	107	60	0.32	111564 1290	189,50	111565 1290	189,50
13	14	107	60	0.33	111564 1300	189,50	111565 1300	189,50
13.5	14	107	60	0.34	111564 1350	189,50	111565 1350	189,50
13.8	14	107	60	0.35	111564 1380	189,50	111565 1380	189,50
14	14	107	60	0.35	111564 1400	189,50	111565 1400	189,50
14.2	16	115	65	0.36	111564 1420	224,-	111565 1420	224,-
14.4	16	115	65	0.36	111564 1440	224,-	111565 1440	224,-
14.5	16	115	65	0.36	111564 1450	224,-	111565 1450	224,-
14.8	16	115	65	0.37	111564 1480	224,-	111565 1480	224,-
15	16	115	65	0.38	111564 1500	224,-	111565 1500	224,-
15.1	16	115	65	0.38	111564 1510	224,-	111565 1510	224,-
15.2	16	115	65	0.38	111564 1520	224,-	111565 1520	224,-
15.5	16	115	65	0.39	111564 1550	224,-	111565 1550	224,-
15.8	16	115	65	0.40	111564 1580	224,-	111565 1580	224,-
16	16	115	65	0.40	111564 1600	224,-	111565 1600	224,-
16.5	18	123	73	0.41	111564 1650	314,-	111565 1650	314,-
17	18	123	73	0.43	111564 1700	314,-	111565 1700	314,-
17.5	18	123	73	0.44	111564 1750	314,-	111565 1750	314,-
18	18	123	73	0.45	111564 1800	314,-	111565 1800	314,-
18.5	20	131	79	0.46	111564 1850	395,-	111565 1850	395,-
18.9	20	131	79	0.47	111564 1890	395,-	111565 1890	395,-
19	20	131	79	0.48	111564 1900	395,-	111565 1900	395,-
19.3	20	131	79	0.48	111564 1930	395,-	111565 1930	395,-
19.5	20	131	79	0.49	111564 1950	395,-	111565 1950	395,-
20	20	131	79	0.50	111564 2000	395,-	111565 2000	395,-

1111

1111

# HYP-HPO-3D solid carbide high-performance drill bit

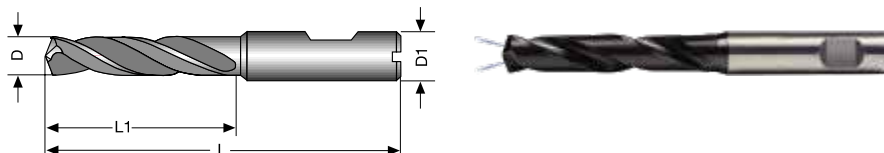
NEW



- Universal geometry
- **Cutting material: Solid carbide WDI coating (TiAlN)**
- With internal cooling

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		100-150	70-110	50-60	40-50	40-50		150-200	100-150	15-25	15-25	120-220	60-110	50-90		15-25	15-20	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
3	6	62	20	0.06	111628 0300	30,25
3.1	6	62	20	0.06	111628 0310	30,25
3.17 (1/8)	6	62	20	0.06	111628 0317	41,75
3.2	6	62	20	0.06	111628 0320	30,25
3.3	6	62	20	0.07	111628 0330	30,25
3.4	6	62	20	0.07	111628 0340	30,25
3.5	6	62	20	0.07	111628 0350	30,25
3.57 (9/64)	6	62	20	0.07	111628 0357	41,75
3.6	6	62	20	0.07	111628 0360	30,25
3.7	6	62	20	0.07	111628 0370	30,25
3.8	6	66	24	0.08	111628 0380	30,25
3.9	6	66	24	0.08	111628 0390	30,25
3.97 (5/32)	6	66	24	0.08	111628 0397	41,75
4	6	66	24	0.08	111628 0400	30,25
4.1	6	66	24	0.08	111628 0410	30,25
4.2	6	66	24	0.08	111628 0420	30,25
4.3	6	66	24	0.09	111628 0430	30,25
4.37 (11/64)	6	66	24	0.09	111628 0437	41,75
4.4	6	66	24	0.09	111628 0440	30,25
4.5	6	66	24	0.09	111628 0450	30,25
4.6	6	66	24	0.09	111628 0460	30,25
4.65	6	66	24	0.09	111628 0465	30,25
4.7	6	66	24	0.09	111628 0470	30,25
4.76 (3/16)	6	66	24	0.10	111628 0476	41,75
4.8	6	66	28	0.10	111628 0480	30,25
4.9	6	66	28	0.10	111628 0490	30,25
5	6	66	28	0.10	111628 0500	30,25
5.1	6	66	28	0.10	111628 0510	30,25
5.16 (13/64)	6	66	28	0.10	111628 0516	41,75
5.2	6	66	28	0.10	111628 0520	30,25
5.3	6	66	28	0.11	111628 0530	30,25
5.4	6	66	28	0.11	111628 0540	30,25
5.5	6	66	28	0.11	111628 0550	30,25
5.55	6	66	28	0.11	111628 0555	30,25
5.56 (7/32)	6	66	28	0.11	111628 0556	41,75
5.6	6	66	28	0.11	111628 0560	30,25
5.7	6	66	28	0.11	111628 0570	30,25
5.8	6	66	28	0.12	111628 0580	30,25
5.9	6	66	28	0.12	111628 0590	30,25
5.95 (15/64)	6	66	28	0.12	111628 0595	41,75
6	6	66	28	0.12	111628 0600	30,25
6.1	8	79	34	0.12	111628 0610	40,-

1107

D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
6.2	8	79	34	0.12	111628 0620	40,-
6.3	8	79	34	0.13	111628 0630	40,-
6.35 (1/4)	8	79	34	0.13	111628 0635	55,50
6.4	8	79	34	0.13	111628 0640	40,-
6.5	8	79	34	0.13	111628 0650	40,-
6.6	8	79	34	0.13	111628 0660	40,-
6.7	8	79	34	0.13	111628 0670	40,-
6.75 (17/64)	8	79	34	0.14	111628 0675	55,50
6.8	8	79	34	0.14	111628 0680	40,-
6.9	8	79	34	0.14	111628 0690	40,-
7	8	79	34	0.14	111628 0700	40,-
7.1	8	79	34	0.14	111628 0710	40,-
7.14 (9/32)	8	79	41	0.14	111628 0714	55,50
7.2	8	79	41	0.14	111628 0720	40,-
7.3	8	79	41	0.15	111628 0730	40,-
7.4	8	79	41	0.15	111628 0740	40,-
7.5	8	79	41	0.15	111628 0750	40,-
7.54 (19/64)	8	79	41	0.15	111628 0754	55,50
7.6	8	79	41	0.15	111628 0760	40,-
7.7	8	79	41	0.15	111628 0770	40,-
7.8	8	79	41	0.16	111628 0780	40,-
7.9	8	79	41	0.16	111628 0790	40,-
7.94 (5/16)	8	79	41	0.16	111628 0794	55,50
8	8	79	41	0.16	111628 0800	40,-
8.1	10	79	41	0.16	111628 0810	61,50
8.2	10	79	41	0.16	111628 0820	61,50
8.3	10	79	41	0.17	111628 0830	61,50
8.33 (21/64)	10	89	47	0.17	111628 0833	85,-
8.4	10	89	47	0.17	111628 0840	61,50
8.5	10	89	47	0.17	111628 0850	61,50
8.6	10	89	47	0.17	111628 0860	61,50
8.7	10	89	47	0.17	111628 0870	61,50
8.73 (11/32)	10	89	47	0.17	111628 0873	85,-
8.8	10	89	47	0.18	111628 0880	61,50
8.9	10	89	47	0.18	111628 0890	61,50
9	10	89	47	0.18	111628 0900	61,50
9.1	10	89	47	0.18	111628 0910	61,50
9.13 (23/64)	10	89	47	0.18	111628 0913	85,-
9.2	10	89	47	0.18	111628 0920	61,50
9.3	10	89	47	0.19	111628 0930	61,50
9.4	10	89	47	0.19	111628 0940	61,50
9.5	10	89	47	0.19	111628 0950	61,50

1107

Continued on next page >>>

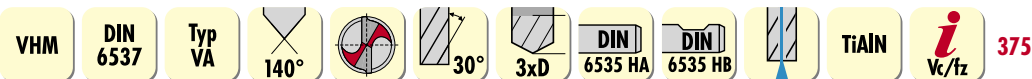
D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
9.52 (3/8)	10	89	47	0.19	111628 0952	85,-
9.6	10	89	47	0.19	111628 0960	61,50
9.7	10	89	47	0.19	111628 0970	61,50
9.8	10	89	47	0.20	111628 0980	61,50
9.9	10	89	47	0.20	111628 0990	61,50
9.92 (25/64)	10	89	47	0.20	111628 0992	85,-
10	10	89	47	0.20	111628 1000	61,50
10.1	12	89	47	0.20	111628 1010	82,-
10.2	12	102	55	0.20	111628 1020	82,-
10.3	12	102	55	0.21	111628 1030	82,-
10.32 (13/32)	12	102	55	0.21	111628 1032	119,-
10.4	12	102	55	0.21	111628 1040	82,-
10.5	12	102	55	0.21	111628 1050	82,-
10.6	12	102	55	0.21	111628 1060	82,-
10.7	12	102	55	0.21	111628 1070	82,-
10.72 (27/64)	12	102	55	0.21	111628 1072	119,-
10.8	12	102	55	0.22	111628 1080	82,-
10.9	12	102	55	0.22	111628 1090	82,-
11	12	102	55	0.22	111628 1100	82,-
11.1	12	102	55	0.22	111628 1110	82,-
11.11 (7/16)	12	102	55	0.22	111628 1111	119,-
11.2	12	102	55	0.22	111628 1120	82,-
11.3	12	102	55	0.23	111628 1130	82,-
11.4	12	102	55	0.23	111628 1140	82,-
11.5	12	102	55	0.23	111628 1150	82,-
11.51 (29/64)	12	102	55	0.23	111628 1151	119,-

1107

D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
11.6	12	102	55	0.23	111628 1160	82,-
11.7	12	102	55	0.23	111628 1170	82,-
11.8	12	102	55	0.24	111628 1180	82,-
11.9	12	102	55	0.24	111628 1190	82,-
11.91 (15/32)	12	102	55	0.24	111628 1191	119,-
12	12	102	55	0.24	111628 1200	82,-
12.3 (31/64)	14	107	60	0.25	111628 1230	149,-
12.5	14	107	60	0.25	111628 1250	104,-
12.7 (1/2)	14	107	60	0.25	111628 1270	149,-
13	14	107	60	0.26	111628 1300	104,-
13.5	14	107	60	0.27	111628 1350	104,-
14	14	107	60	0.28	111628 1400	104,-
14.29 (9/16)	16	115	65	0.29	111628 1429	194,-
14.5	16	115	65	0.29	111628 1450	134,-
15	16	115	65	0.30	111628 1500	134,-
15.5	16	115	65	0.31	111628 1550	134,-
15.87 (5/8)	16	115	65	0.32	111628 1587	194,-
16	16	115	65	0.32	111628 1600	134,-
16.5	18	123	73	0.33	111628 1650	216,-
17	18	123	73	0.34	111628 1700	216,-
17.5	18	123	73	0.35	111628 1750	216,-
18	18	123	73	0.36	111628 1800	216,-
18.5	20	131	79	0.37	111628 1850	234,-
19	20	131	79	0.38	111628 1900	234,-
19.5	20	131	79	0.39	111628 1950	234,-
20	20	131	79	0.40	111628 2000	234,-

1107

### ATORN® Solid carbide high-performance drill bit Ultra-M 3D

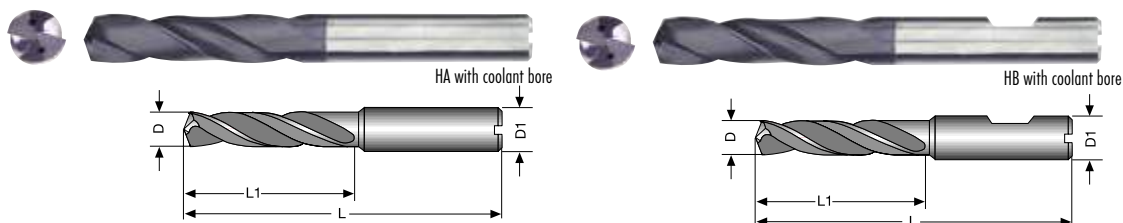


**Especially for stainless steel**

- Special geometry, facet-ground, maximum tool life, high process reliability
- Shank design:  
HA with coolant bore, smooth straight shank, DIN 6535 HA  
HB with coolant bore straight shank DIN 6535 HB
- **Cutting material: solid carbide, TiAlN-Ultra-M-coated**
- True-running accuracy of the tool when clamped max. 0.02 mm
- **Especially suitable for stainless steel and superalloys**

material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
			< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
						80	60	48			35	30	30								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f stainless steel austenitic mm/rev	HA art.no.	€	HB art.no.	€
3.00	6	62	20	0.05	111545 0030	61,10	111549 0030	61,10
3.10	6	62	20	0.05	111545 0031	61,10	111549 0031	61,10
3.20	6	62	20	0.05	111545 0032	61,10	111549 0032	61,10
3.25	6	62	20	0.05	111545 1325	61,10	111549 0325	61,10
3.30	6	62	20	0.05	111545 0033	61,10	111549 0033	61,10
3.40	6	62	20	0.05	111545 0034	61,10	111549 0034	61,10
3.50	6	62	20	0.06	111545 0035	61,10	111549 0035	61,10

1154

1154

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f stainless steel austenitic mm/rev	HA art.no.	€	HB art.no.	€
3.60	6	62	20	0.06	111545 0036	61,10	111549 0036	61,10
3.70	6	62	20	0.06	111545 0037	61,10	111549 0037	61,10
3.80	6	66	24	0.06	111545 0038	61,10	111549 0038	61,10
3.90	6	66	24	0.06	111545 0039	61,10	111549 0039	61,10
4.00	6	66	24	0.06	111545 0040	61,10	111549 0040	61,10
4.10	6	66	24	0.06	111545 0041	61,10	111549 0041	61,10
4.20	6	66	24	0.06	111545 0042	61,10	111549 0042	61,10

1154

1154



D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f stainless steel austenitic mm/rev	HA		HB	
					art.no.	€	art.no.	€
4.30	6	66	24	0.06	111545 0043	61,10	111549 0043	61,10
4.40	6	66	24	0.06	111545 0044	61,10	111549 0044	61,10
4.50	6	66	24	0.06	111545 0045	61,10	111549 0045	61,10
4.60	6	66	24	0.06	111545 0046	61,10	111549 0046	61,10
4.65	6	66	24	0.06	111545 1465	61,10	111549 0465	61,10
4.70	6	66	24	0.06	111545 0047	61,10	111549 0047	61,10
4.80	6	66	28	0.06	111545 0048	61,10	111549 0048	61,10
4.90	6	66	28	0.06	111545 0049	61,10	111549 0049	61,10
5.00	6	66	28	0.06	111545 0050	61,10	111549 0050	61,10
5.10	6	66	28	0.06	111545 0051	61,10	111549 0051	61,10
5.20	6	66	28	0.06	111545 0052	61,10	111549 0052	61,10
5.30	6	66	28	0.06	111545 0053	61,10	111549 0053	61,10
5.40	6	66	28	0.06	111545 0054	61,10	111549 0054	61,10
5.50	6	66	28	0.08	111545 0055	61,10	111549 0055	61,10
5.55	6	66	28	0.08	111545 1555	61,10	111549 0555	61,10
5.60	6	66	28	0.08	111545 0056	61,10	111549 0056	61,10
5.70	6	66	28	0.08	111545 0057	61,10	111549 0057	61,10
5.80	6	66	28	0.08	111545 0058	61,10	111549 0058	61,10
5.90	6	66	28	0.08	111545 0059	61,10	111549 0059	61,10
6.00	6	66	28	0.08	111545 0060	61,10	111549 0060	61,10
6.10	8	79	34	0.08	111545 0061	80,90	111549 0061	80,90
6.20	8	79	34	0.08	111545 0062	80,90	111549 0062	80,90
6.30	8	79	34	0.08	111545 0063	80,90	111549 0063	80,90
6.40	8	79	34	0.08	111545 0064	80,90	111549 0064	80,90
6.50	8	79	34	0.08	111545 0065	80,90	111549 0065	80,90
6.60	8	79	34	0.08	111545 0066	80,90	111549 0066	80,90
6.70	8	79	34	0.08	111545 0067	80,90	111549 0067	80,90
6.80	8	79	34	0.08	111545 0068	80,90	111549 0068	80,90
6.90	8	79	34	0.08	111545 0069	80,90	111549 0069	80,90
7.00	8	79	34	0.08	111545 0070	80,90	111549 0070	80,90
7.10	8	79	41	0.10	111545 0071	80,90	111549 0071	80,90
7.20	8	79	41	0.10	111545 0072	80,90	111549 0072	80,90
7.30	8	79	41	0.10	111545 0073	80,90	111549 0073	80,90
7.40	8	79	41	0.10	111545 0074	80,90	111549 0074	80,90
7.50	8	79	41	0.10	111545 0075	80,90	111549 0075	80,90
7.60	8	79	41	0.10	111545 0076	80,90	111549 0076	80,90
7.70	8	79	41	0.10	111545 0077	80,90	111549 0077	80,90
7.80	8	79	41	0.10	111545 0078	80,90	111549 0078	80,90
7.90	8	79	41	0.10	111545 0079	80,90	111549 0079	80,90
8.00	8	79	41	0.10	111545 0080	80,90	111549 0080	80,90
8.10	10	89	47	0.10	111545 0081	97,20	111549 0081	97,20
8.20	10	89	47	0.10	111545 0082	97,20	111549 0082	97,20
8.30	10	89	47	0.10	111545 0083	97,20	111549 0083	97,20
8.40	10	89	47	0.10	111545 0084	97,20	111549 0084	97,20
8.50	10	89	47	0.10	111545 0085	97,20	111549 0085	97,20
8.60	10	89	47	0.10	111545 0086	97,20	111549 0086	97,20
8.70	10	89	47	0.10	111545 0087	97,20	111549 0087	97,20
8.80	10	89	47	0.10	111545 0088	97,20	111549 0088	97,20
8.90	10	89	47	0.10	111545 0089	97,20	111549 0089	97,20
9.00	10	89	47	0.10	111545 0090	97,20	111549 0090	97,20
					1154			1154

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f stainless steel austenitic mm/rev	HA		HB	
					art.no.	€	art.no.	€
9.10	10	89	47	0.12	111545 0091	97,20	111549 0091	97,20
9.20	10	89	47	0.12	111545 0092	97,20	111549 0092	97,20
9.25	10	89	47	0.12	111545 1925	97,20	111549 0925	97,20
9.30	10	89	47	0.12	111545 0093	97,20	111549 0093	97,20
9.40	10	89	47	0.12	111545 0094	97,20	111549 0094	97,20
9.50	10	89	47	0.12	111545 0095	97,20	111549 0095	97,20
9.60	10	89	47	0.12	111545 0096	97,20	111549 0096	97,20
9.70	10	89	47	0.12	111545 0097	97,20	111549 0097	97,20
9.80	10	89	47	0.12	111545 0098	97,20	111549 0098	97,20
9.90	10	89	47	0.12	111545 0099	97,20	111549 0099	97,20
10.00	10	89	47	0.12	111545 0100	97,20	111549 0100	97,20
10.10	12	102	55	0.12	111545 0101	141,50	111549 0101	141,50
10.20	12	102	55	0.12	111545 0102	141,50	111549 0102	141,50
10.30	12	102	55	0.12	111545 0103	141,50	111549 0103	141,50
10.40	12	102	55	0.12	111545 0104	141,50	111549 0104	141,50
10.50	12	102	55	0.12	111545 0105	141,50	111549 0105	141,50
10.60	12	102	55	0.12	111545 0106	141,50	111549 0106	141,50
10.70	12	102	55	0.12	111545 0107	141,50	111549 0107	141,50
10.80	12	102	55	0.12	111545 0108	141,50	111549 0108	141,50
10.90	12	102	55	0.12	111545 0109	141,50	111549 0109	141,50
11.00	12	102	55	0.12	111545 0110	141,50	111549 0110	141,50
11.10	12	102	55	0.12	111545 0111	141,50	111549 0111	141,50
11.20	12	102	55	0.12	111545 0112	141,50	111549 0112	141,50
11.30	12	102	55	0.12	111545 0113	141,50	111549 0113	141,50
11.40	12	102	55	0.12	111545 0114	141,50	111549 0114	141,50
11.50	12	102	55	0.12	111545 0115	141,50	111549 0115	141,50
11.60	12	102	55	0.12	111545 0116	141,50	111549 0116	141,50
11.70	12	102	55	0.12	111545 0117	141,50	111549 0117	141,50
11.80	12	102	55	0.12	111545 0118	141,50	111549 0118	141,50
11.90	12	102	55	0.12	111545 0119	141,50	111549 0119	141,50
12.00	12	102	55	0.12	111545 0120	141,50	111549 0120	141,50
12.50	14	107	60	0.12	111545 0125	183,50	111549 0125	183,50
12.70	14	107	60	0.12	111545 0127	183,50	111549 0127	183,50
13.00	14	107	60	0.12	111545 0130	183,50	111549 0130	183,50
13.50	14	107	60	0.12	111545 0135	183,50	111549 0135	183,50
14.00	14	107	60	0.12	111545 0140	183,50	111549 0140	183,50
14.50	16	115	65	0.12	111545 0145	214,-	111549 0145	214,-
15.00	16	115	65	0.12	111545 0150	214,-	111549 0150	214,-
15.50	16	115	65	0.12	111545 0155	214,-	111549 0155	214,-
16.00	16	115	65	0.12	111545 0160	214,-	111549 0160	214,-
16.50	18	123	73	0.12	111545 0165	355,-	111549 0165	355,-
16.90	18	123	73	0.12	111545 0169	355,-	111549 0169	355,-
17.00	18	123	73	0.12	111545 0170	355,-	111549 0170	355,-
17.50	18	123	73	0.14	111545 0175	355,-	111549 0175	355,-
18.00	18	123	73	0.14	111545 0180	355,-	111549 0180	355,-
18.50	20	131	79	0.14	111545 0185	385,-	111549 0185	385,-
18.90	20	131	79	0.14	111545 0189	385,-	111549 0189	385,-
19.00	20	131	79	0.14	111545 0190	385,-	111549 0190	385,-
19.50	20	131	79	0.16	111545 0195	385,-	111549 0195	385,-
20.00	20	131	79	0.16	111545 0200	385,-	111549 0200	385,-
					1154			1154





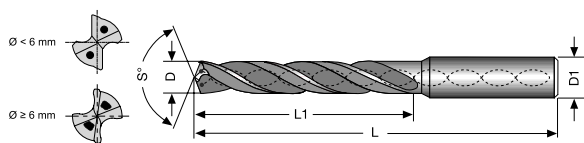
# ADO-SUS-3D solid carbide high-performance drill

VHM
Werks-norm
Typ VA
140°
30°
3xD
DIN 6535 HA
TiAlN
i Vc/fz
382

- **Cutting material: solid carbide, EgiAs coating**
- Sharp cutting edges reduce machining-induced material hardenings
- **Short and compact chips thanks to innovative chip flute geometry**
- Friction-reducing protective chamfer reduces heat development
- **New coolant bore design increases coolant flow rate and thus reduces heat generation in the material**
- Increased coating adhesion of the new EgiAs coating reduces premature wear and coating spalling

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		80-120	80-120	60-90	60-100	60-100	30-60	60-100	80-120	20-50			140	120	70					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2.8	3	66	17	0.06	111613 0280	48,25
2.83	3	66	17	0.06	111613 0283	48,25
2.87	3	66	18	0.06	111613 0287	48,25
2.9	3	66	18	0.06	111613 0290	48,25
3	3	66	18	0.06	111613 0300	48,25
3.1	4	74	19	0.08	111613 0310	52,-
3.2	4	74	20	0.08	111613 0320	52,-
3.3	4	74	20	0.08	111613 0330	52,-
3.4	4	74	21	0.08	111613 0340	52,-
3.5	4	74	21	0.08	111613 0350	52,-
3.6	4	74	22	0.08	111613 0360	54,50
3.7	4	74	23	0.08	111613 0370	54,50
3.73	4	74	23	0.08	111613 0373	54,50
3.8	4	74	23	0.08	111613 0380	54,50
3.9	4	74	24	0.08	111613 0390	54,50
4	4	74	24	0.08	111613 0400	54,50
4.1	6	80	25	0.10	111613 0410	59,-
4.2	6	80	26	0.10	111613 0420	59,-
4.3	6	80	26	0.10	111613 0430	59,-
4.4	6	80	27	0.10	111613 0440	59,-
4.45	6	80	27	0.10	111613 0445	59,-
4.5	6	80	27	0.10	111613 0450	59,-
4.6	6	80	28	0.10	111613 0460	63,50
4.65	6	80	28	0.10	111613 0465	63,50
4.7	6	80	29	0.10	111613 0470	63,50
4.8	6	80	29	0.10	111613 0480	63,50
4.9	6	80	30	0.10	111613 0490	63,50
5	6	80	25	0.10	111613 0500	63,50
5.1	6	82	26	0.12	111613 0510	67,-
5.2	6	82	26	0.12	111613 0520	67,-
5.3	6	82	27	0.12	111613 0530	67,-
5.4	6	82	27	0.12	111613 0540	67,-
5.5	6	82	28	0.12	111613 0550	67,-
5.55	6	82	28	0.12	111613 0555	70,-
5.6	6	82	28	0.12	111613 0560	70,-
5.7	6	82	29	0.12	111613 0570	70,-
5.8	6	82	29	0.12	111613 0580	70,-

1107

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
5.9	6	82	30	0.12	111613 0590	70,-
6	6	82	30	0.12	111613 0600	70,-
6.1	8	88	31	0.14	111613 0610	78,50
6.2	8	88	31	0.14	111613 0620	78,50
6.3	8	88	32	0.14	111613 0630	78,50
6.4	8	88	32	0.14	111613 0640	78,50
6.5	8	88	33	0.14	111613 0650	78,50
6.6	8	88	33	0.14	111613 0660	78,50
6.7	8	88	34	0.14	111613 0670	78,50
6.8	8	88	34	0.14	111613 0680	78,50
6.9	8	88	35	0.14	111613 0690	78,50
7	8	88	35	0.14	111613 0700	78,50
7.1	8	94	36	0.16	111613 0710	78,50
7.2	8	94	36	0.16	111613 0720	78,50
7.3	8	94	37	0.16	111613 0730	78,50
7.4	8	94	37	0.16	111613 0740	78,50
7.45	8	94	38	0.16	111613 0745	78,50
7.5	8	94	38	0.16	111613 0750	78,50
7.55	8	94	38	0.16	111613 0755	82,50
7.6	8	94	38	0.16	111613 0760	82,50
7.7	8	94	39	0.16	111613 0770	82,50
7.8	8	94	39	0.16	111613 0780	82,50
7.9	8	94	40	0.16	111613 0790	82,50
8	8	94	40	0.16	111613 0800	82,50
8.1	10	101	41	0.18	111613 0810	98,50
8.2	10	101	41	0.18	111613 0820	98,50
8.3	10	101	42	0.18	111613 0830	98,50
8.4	10	101	42	0.18	111613 0840	98,50
8.5	10	101	43	0.18	111613 0850	98,50
8.6	10	101	43	0.18	111613 0860	98,50
8.7	10	101	44	0.18	111613 0870	98,50
8.8	10	101	44	0.18	111613 0880	98,50
8.9	10	101	45	0.18	111613 0890	98,50
9	10	101	45	0.18	111613 0900	98,50
9.1	10	106	46	0.20	111613 0910	98,50
9.2	10	106	46	0.20	111613 0920	98,50
9.3	10	106	47	0.20	111613 0930	98,50

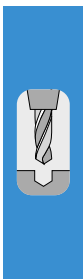
1107

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
9.4	10	106	47	0.20	111613 0940	98,50
9.5	10	106	48	0.20	111613 0950	98,50
9.55	10	106	48	0.20	111613 0955	101,-
9.6	10	106	48	0.20	111613 0960	101,-
9.7	10	106	49	0.20	111613 0970	101,-
9.8	10	106	49	0.20	111613 0980	101,-
9.9	10	106	50	0.20	111613 0990	101,-
10	10	106	50	0.20	111613 1000	101,-
10.1	12	113	51	0.22	111613 1010	114,-
10.2	12	113	51	0.22	111613 1020	114,-
10.3	12	113	52	0.22	111613 1030	114,-
10.4	12	113	52	0.22	111613 1040	114,-
10.5	12	113	53	0.22	111613 1050	114,-
10.6	12	113	53	0.22	111613 1060	114,-
10.7	12	113	54	0.22	111613 1070	114,-
10.8	12	113	54	0.22	111613 1080	114,-
10.9	12	113	55	0.22	111613 1090	114,-
11	12	113	55	0.22	111613 1100	114,-
11.1	12	120	56	0.24	111613 1110	114,-
11.2	12	120	56	0.24	111613 1120	114,-
11.3	12	120	57	0.24	111613 1130	114,-
11.4	12	120	57	0.24	111613 1140	114,-
11.5	12	120	58	0.24	111613 1150	114,-
11.6	12	120	58	0.24	111613 1160	116,-
11.7	12	120	59	0.24	111613 1170	116,-
11.8	12	120	59	0.24	111613 1180	116,-
11.9	12	120	60	0.24	111613 1190	116,-
12	12	120	60	0.24	111613 1200	116,-
12.1	14	128	61	0.26	111613 1210	128,-
12.5	14	128	63	0.26	111613 1250	128,-
12.8	14	128	64	0.26	111613 1280	128,-

1107

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
13	14	128	65	0.26	111613 1300	128,-
13.1	14	134	66	0.28	111613 1310	128,-
13.2	14	134	67	0.28	111613 1320	128,-
13.3	14	134	68	0.28	111613 1330	128,-
13.43	14	134	68	0.28	111613 1343	128,-
13.5	14	134	68	0.28	111613 1350	128,-
13.55	14	134	68	0.28	111613 1355	131,-
13.6	14	134	68	0.28	111613 1360	131,-
14	14	134	70	0.28	111613 1400	131,-
14.5	16	140	73	0.28	111613 1450	144,-
15	16	140	75	0.28	111613 1500	144,-
15.1	16	145	76	0.28	111613 1510	144,-
15.3	16	145	77	0.28	111613 1530	144,-
15.5	16	145	78	0.28	111613 1550	144,-
15.55	16	145	78	0.28	111613 1555	147,-
16	16	145	80	0.30	111613 1600	147,-
16.5	18	150	83	0.30	111613 1650	214,-
16.7	18	150	84	0.30	111613 1670	214,-
17	18	150	85	0.30	111613 1700	214,-
17.3	18	155	87	0.30	111613 1730	214,-
17.5	18	155	88	0.30	111613 1750	214,-
17.55	18	155	88	0.30	111613 1755	218,-
18	18	155	90	0.32	111613 1800	218,-
18.5	20	160	93	0.32	111613 1850	280,-
18.7	20	160	94	0.32	111613 1870	280,-
19	20	160	95	0.34	111613 1900	280,-
19.3	20	165	97	0.34	111613 1930	280,-
19.5	20	165	98	0.34	111613 1950	280,-
19.55	20	165	98	0.34	111613 1955	282,-
20	20	165	100	0.36	111613 2000	282,-

1107



### ATORN® Solid carbide high-performance drill bit HARD 3D

NEW

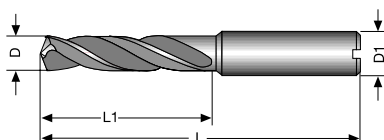
VHM Werks-norm Typ H 140° 20° 3xD DIN 6535 HA TiAlSiN i Vc/fz 374

- for machining drill holes up to 65 HRC
- **Cutting material: SC, TiAlSiN coating**
- reinforced core and special point thinning with sharp chisel edge
- no internal coolant supply for increased stability
- **also available in 5xD**
- **Note:** Do not hard drill dry!

Up to 65 HRC

material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC			
			30-40							60-70								15-20	10-16	8-13

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 h6 mm	L1 mm	L mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
1	4	7	45	0.04	111535 0010	46,30
1.3	4	7	45	0.04	111535 0013	46,30
1.5	4	14	55	0.04	111535 0015	46,30
1.6	4	14	55	0.04	111535 0016	46,30
1.7	4	14	55	0.04	111535 0017	46,30

1154

D mm	D1 h6 mm	L1 mm	L mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
1.8	4	14	55	0.04	111535 0018	46,30
1.9	4	14	55	0.04	111535 0019	46,30
2	4	20	55	0.04	111535 0020	46,30
2.1	4	20	55	0.04	111535 0021	46,30
2.2	4	20	55	0.04	111535 0022	46,30

1154

Continued on next page >>>

D mm	D1 h6 mm	L1 mm	L mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
2.3	4	20	55	0.04	111535 0023	46,30
2.5	4	20	55	0.04	111535 0025	46,30
2.6	4	20	55	0.04	111535 0026	46,30
2.7	4	20	55	0.04	111535 0027	46,30
2.8	4	20	55	0.04	111535 0028	46,30
2.9	4	20	55	0.04	111535 0029	46,30
3	6	20	62	0.04	111535 0030	46,30
3.1	6	20	62	0.06	111535 0031	46,30
3.2	6	20	62	0.06	111535 0032	46,30
3.3	6	20	62	0.06	111535 0033	46,30
3.4	6	20	62	0.06	111535 0034	46,30
3.5	6	20	62	0.06	111535 0035	46,30
3.7	6	20	62	0.06	111535 0037	46,30
3.8	6	24	66	0.06	111535 0038	46,30
3.9	6	24	62	0.06	111535 0039	46,30
4	6	24	66	0.06	111535 0040	46,30
4.1	6	24	66	0.06	111535 0041	46,30
4.2	6	24	66	0.06	111535 0042	46,30
4.3	6	24	66	0.06	111535 0043	46,30
4.4	6	24	66	0.06	111535 0044	46,30
4.5	6	24	66	0.06	111535 0045	46,30
4.7	6	24	66	0.06	111535 0047	46,30
4.8	6	28	66	0.06	111535 0048	46,30
4.9	6	28	66	0.06	111535 0049	46,30
5	6	28	66	0.06	111535 0050	46,30
5.1	6	28	66	0.07	111535 0051	46,30
5.2	6	28	66	0.07	111535 0052	46,30
5.3	6	28	66	0.07	111535 0053	46,30
5.4	6	28	66	0.07	111535 0054	46,30
5.5	6	28	66	0.07	111535 0055	46,30
5.6	6	28	66	0.07	111535 0056	46,30
5.7	6	28	66	0.07	111535 0057	46,30
5.8	6	28	66	0.07	111535 0058	46,30
5.9	6	28	66	0.07	111535 0059	46,30
6	6	28	66	0.07	111535 0060	46,30
6.1	8	34	79	0.07	111535 0061	47,80
6.2	8	34	79	0.07	111535 0062	47,80
6.5	8	34	79	0.07	111535 0065	47,80
6.6	8	34	79	0.07	111535 0066	47,80
6.7	8	34	79	0.07	111535 0067	47,80
6.8	8	34	79	0.07	111535 0068	47,80
6.9	8	34	79	0.07	111535 0069	47,80
7	8	34	79	0.07	111535 0070	47,80
7.1	8	41	79	0.07	111535 0071	47,80
7.2	8	41	79	0.07	111535 0072	47,80
7.3	8	41	79	0.07	111535 0073	47,80
7.5	8	41	79	0.07	111535 0075	47,80
7.6	8	41	79	0.07	111535 0076	47,80
7.7	8	41	79	0.07	111535 0077	47,80
7.8	8	41	79	0.07	111535 0078	47,80

1154

D mm	D1 h6 mm	L1 mm	L mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
7.9	8	41	79	0.07	111535 0079	47,80
8	8	41	79	0.07	111535 0080	47,80
8.1	10	47	89	0.08	111535 0081	54,-
8.3	10	47	89	0.08	111535 0083	54,-
8.5	10	47	89	0.08	111535 0085	54,-
8.6	10	47	89	0.08	111535 0086	54,-
8.7	10	47	89	0.08	111535 0087	54,-
8.8	10	47	89	0.08	111535 0088	54,-
8.9	10	47	89	0.08	111535 0089	54,-
9	10	47	89	0.08	111535 0090	54,-
9.2	10	47	89	0.08	111535 0092	54,-
9.5	10	47	89	0.08	111535 0095	54,-
9.6	10	47	89	0.08	111535 0096	54,-
9.7	10	47	89	0.08	111535 0097	54,-
9.8	10	47	89	0.08	111535 0098	54,-
9.9	10	47	89	0.08	111535 0099	54,-
10	10	47	89	0.08	111535 0100	54,-
10.2	12	55	102	0.08	111535 0102	78,40
10.4	12	55	102	0.08	111535 0104	78,40
10.5	12	55	102	0.08	111535 0105	78,40
10.8	12	55	102	0.08	111535 0108	78,40
11	12	55	102	0.08	111535 0110	78,40
11.5	12	55	102	0.08	111535 0115	78,40
11.6	12	55	102	0.08	111535 0116	78,40
11.7	12	55	102	0.08	111535 0117	78,40
11.8	12	55	102	0.08	111535 0118	78,40
11.9	12	55	102	0.08	111535 0119	78,40
12	12	55	102	0.08	111535 0120	78,40
12.2	14	60	107	0.1	111535 0122	105,-
12.5	14	60	107	0.1	111535 0125	105,-
12.8	14	60	107	0.1	111535 0128	105,-
13	14	60	107	0.1	111535 0130	105,-
13.5	14	60	107	0.1	111535 0135	105,-
14	14	60	107	0.1	111535 0140	105,-
14.2	16	65	115	0.1	111535 0142	135,50
14.3	16	65	115	0.1	111535 0143	135,50
14.5	16	65	115	0.1	111535 0145	135,50
14.8	16	65	115	0.1	111535 0148	135,50
15	16	65	115	0.1	111535 0150	135,50
15.5	16	65	115	0.1	111535 0155	135,50
15.8	16	65	115	0.1	111535 0158	135,50
16	16	65	115	0.1	111535 0160	135,50
17	18	73	123	0.11	111535 0170	209,-
17.5	18	73	123	0.11	111535 0175	209,-
18	18	73	123	0.11	111535 0180	209,-
18.5	20	79	131	0.11	111535 0185	247,-
19	20	79	131	0.11	111535 0190	247,-
19.5	20	79	131	0.11	111535 0195	247,-
20	20	79	131	0.11	111535 0200	247,-

1154

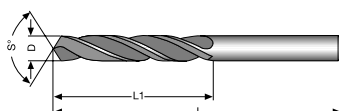
# ATORN® Solid carbide twist drill bit

VHM
Werknorm
Typ N
118°
32°
5xD
TiN
TiAlN
i Vc/tz
372
376

- sim. to DIN 338
- 111010.... Facet-ground, point thinning from  $\varnothing$  2.0 mm
- 111011.... Facet-ground, point thinning from  $\varnothing$  2.0 mm, TiN-coated
- 111012.... Facet-ground, point thinning from  $\varnothing$  2.0 mm, TiAlN-coated

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
111010....	●	80	50-70	50	●			70-90	80	○			●	●	●		○		
111011....	●	80-90	70-80	55	●			70-102	80	○			●	●	●		○		
111012....	●	90-100	80-90	65	●	○		80-115	90	○	○		●	●	●		○		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€	TiN art.no.	€	TiAlN art.no.	€
1	34	12	0.02	111010 0100	5,85	111011 0100	9,15	111012 0100	9,55
1.1	36	14	0.02	111010 0110	5,85	111011 0110	9,15	111012 0110	9,55
1.2	38	16	0.02	111010 0120	5,85	111011 0120	9,15	111012 0120	9,55
1.3	38	16	0.02	111010 0130	5,85	111011 0130	9,15	111012 0130	9,55
1.4	40	18	0.02	111010 0140	5,85	111011 0140	9,15	111012 0140	9,55
1.5	40	18	0.02	111010 0150	5,85	111011 0150	9,15	111012 0150	9,55
1.6	43	20	0.02	111010 0160	6,85	111011 0160	10,35	111012 0160	11,25
1.7	43	20	0.02	111010 0170	6,85	111011 0170	10,35	111012 0170	11,25
1.8	46	22	0.02	111010 0180	7,30	111011 0180	10,90	111012 0180	12,75
1.9	46	22	0.02	111010 0190	7,30	111011 0190	10,90	111012 0190	12,75
2	49	24	0.02	111010 0200	7,30	111011 0200	10,90	111012 0200	12,75
2.1	49	24	0.03	111010 0210	9,45	111011 0210	14,-	111012 0210	14,05
2.2	53	27	0.03	111010 0220	9,45	111011 0220	14,-	111012 0220	14,05
2.3	53	27	0.03	111010 0230	9,45	111011 0230	14,-	111012 0230	14,05
2.4	57	30	0.03	111010 0240	9,45	111011 0240	14,-	111012 0240	14,05
2.5	57	30	0.07	111010 0250	9,45	111011 0250	14,-	111012 0250	14,05
2.6	57	30	0.07	111010 0260	12,75	111011 0260	18,25	111012 0260	16,05
2.7	61	33	0.07	111010 0270	12,75	111011 0270	18,25	111012 0270	16,05
2.8	61	33	0.07	111010 0280	12,75	111011 0280	18,25	111012 0280	16,05
2.9	61	33	0.07	111010 0290	12,75	111011 0290	18,25	111012 0290	16,05
3	61	33	0.07	111010 0300	13,50	111011 0300	20,30	111012 0300	19,95
3.1	65	36	0.07	111010 0310	13,50	111011 0310	20,30	111012 0310	19,95
3.2	65	36	0.07	111010 0320	13,50	111011 0320	20,30	111012 0320	19,95
3.3	65	36	0.07	111010 0330	13,50	111011 0330	20,30	111012 0330	19,95
3.4	70	39	0.07	111010 0340	13,50	111011 0340	20,30	111012 0340	19,95
3.5	70	39	0.07	111010 0350	14,15	111011 0350	21,20	111012 0350	21,80
3.6	70	39	0.07	111010 0360	14,15	111011 0360	21,20	111012 0360	21,80
3.7	70	39	0.07	111010 0370	14,15	111011 0370	21,20	111012 0370	21,80
3.8	75	43	0.07	111010 0380	15,40	111011 0380	23,-	111012 0380	24,20
3.9	75	43	0.07	111010 0390	15,40	111011 0390	23,-	111012 0390	24,20
4	75	43	0.07	111010 0400	15,40	111011 0400	23,-	111012 0400	24,20
4.1	75	43	0.07	111010 0410	15,40	111011 0410	23,-	111012 0410	24,20
4.2	75	43	0.07	111010 0420	15,40	111011 0420	23,-	111012 0420	24,20
4.3	80	47	0.07	111010 0430	20,10	111011 0430	30,50	111012 0430	27,10
4.4	80	47	0.07	111010 0440	20,10	111011 0440	30,50	111012 0440	27,10
4.5	80	47	0.07	111010 0450	20,10	111011 0450	30,50	111012 0450	27,10
4.6	80	47	0.07	111010 0460	21,70	111011 0460	32,60	111012 0460	28,40
4.7	80	47	0.07	111010 0470	21,70	111011 0470	32,60	111012 0470	28,40

1154

1154

1154

Continued on next page >>>

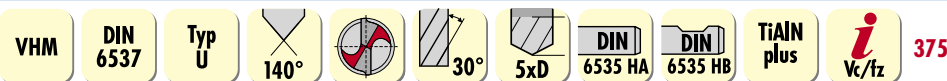
D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev			TiN		TiAlN	
				art.no.	€	art.no.	€	art.no.	€
4.8	86	52	0.07	111010 0480	21,70	111011 0480	32,60	111012 0480	28,40
4.9	86	52	0.07	111010 0490	21,70	111011 0490	32,60	111012 0490	28,40
5	86	52	0.07	111010 0500	21,70	111011 0500	32,60	111012 0500	28,40
5.1	86	52	0.10	111010 0510	24,50	111011 0510	43,40	111012 0510	36,10
5.2	86	52	0.10	111010 0520	24,50	111011 0520	43,40	111012 0520	36,10
5.3	86	52	0.10	111010 0530	24,50	111011 0530	43,40	111012 0530	36,10
5.4	93	57	0.10	111010 0540	29,-	111011 0540	43,40	111012 0540	39,40
5.5	93	57	0.10	111010 0550	29,-	111011 0550	43,40	111012 0550	39,40
5.6	93	57	0.10	111010 0560	29,-	111011 0560	43,40	111012 0560	39,40
5.7	93	57	0.10	111010 0570	29,-	111011 0570	43,40	111012 0570	39,40
5.8	93	57	0.10	111010 0580	29,-	111011 0580	43,40	111012 0580	39,40
5.9	93	57	0.10	111010 0590	29,-	111011 0590	43,40	111012 0590	39,40
6	93	57	0.10	111010 0600	29,-	111011 0600	43,40	111012 0600	39,40
6.1	101	63	0.10	111010 0610	34,60	111011 0610	52,40	111012 0610	46,90
6.2	101	63	0.10	111010 0620	34,60	111011 0620	52,40	111012 0620	46,90
6.3	101	63	0.10	111010 0630	34,60	111011 0630	52,40	111012 0630	46,90
6.4	101	63	0.10	111010 0640	34,60	111011 0640	52,40	111012 0640	46,90
6.5	101	63	0.10	111010 0650	34,60	111011 0650	52,40	111012 0650	46,90
6.6	101	63	0.10	111010 0660	40,50	111011 0660	62,20	111012 0660	54,90
6.7	101	63	0.10	111010 0670	40,50	111011 0670	62,20	111012 0670	54,90
6.8	109	69	0.10	111010 0680	40,50	111011 0680	62,20	111012 0680	54,90
6.9	109	69	0.10	111010 0690	40,50	111011 0690	62,20	111012 0690	54,90
7	109	69	0.10	111010 0700	40,50	111011 0700	62,20	111012 0700	54,90
7.1	109	69	0.10	111010 0710	42,40	111011 0710	64,70	111012 0710	59,-
7.2	109	69	0.10	111010 0720	42,40	111011 0720	64,70	111012 0720	59,-
7.3	109	69	0.10	111010 0730	42,40	111011 0730	64,70	111012 0730	59,-
7.4	109	69	0.10	111010 0740	42,40	111011 0740	64,70	111012 0740	59,-
7.5	109	69	0.10	111010 0750	42,40	111011 0750	64,70	111012 0750	59,-
7.6	117	75	0.10	111010 0760	47,40	111011 0760	73,-	111012 0760	62,90
7.7	117	75	0.10	111010 0770	47,40	111011 0770	73,-	111012 0770	62,90
7.8	117	75	0.10	111010 0780	47,40	111011 0780	73,-	111012 0780	62,90
7.9	117	75	0.10	111010 0790	47,40	111011 0790	73,-	111012 0790	62,90
8	117	75	0.10	111010 0800	47,40	111011 0800	73,-	111012 0800	62,90
8.1	117	75	0.14	111010 0810	53,60	111011 0810	84,80	111012 0810	73,80
8.2	117	75	0.14	111010 0820	53,60	111011 0820	84,80	111012 0820	73,80
8.3	117	75	0.14	111010 0830	53,60	111011 0830	84,80	111012 0830	73,80
8.4	117	75	0.14	111010 0840	53,60	111011 0840	84,80	111012 0840	73,80
8.5	117	75	0.14	111010 0850	53,60	111011 0850	84,80	111012 0850	73,80
8.6	125	81	0.14	111010 0860	57,60	111011 0860	92,50	111012 0860	85,30
8.7	125	81	0.14	111010 0870	57,60	111011 0870	92,50	111012 0870	85,30
8.8	125	81	0.14	111010 0880	57,60	111011 0880	92,50	111012 0880	85,30
8.9	125	81	0.14	111010 0890	57,60	111011 0890	92,50	111012 0890	85,30
9	125	81	0.14	111010 0900	57,60	111011 0900	92,50	111012 0900	85,30
9.1	125	81	0.14	111010 0910	68,10	111011 0910	108,-	111012 0910	95,30
9.2	125	81	0.14	111010 0920	68,10	111011 0920	108,-	111012 0920	95,30
9.3	125	81	0.14	111010 0930	68,10	111011 0930	108,-	111012 0930	95,30
9.4	125	81	0.14	111010 0940	68,10	111011 0940	108,-	111012 0940	95,30
9.5	125	81	0.14	111010 0950	68,10	111011 0950	108,-	111012 0950	95,30
9.6	133	87	0.14	111010 0960	68,10	111011 0960	108,-	111012 0960	95,30
9.7	133	87	0.14	111010 0970	68,10	111011 0970	108,-	111012 0970	95,30
9.8	133	87	0.14	111010 0980	68,10	111011 0980	108,-	111012 0980	95,30
9.9	133	87	0.14	111010 0990	68,10	111011 0990	108,-	111012 0990	95,30
10	133	87	0.14	111010 1000	68,10	111011 1000	108,-	111012 1000	95,30
10.2	133	87	0.14	111010 1020	82,20	111011 1020	130,-	111012 1020	106,50
10.5	133	87	0.14	111010 1050	82,20	111011 1050	130,-	111012 1050	106,50
11	142	94	0.14	111010 1100	101,50	111011 1100	160,50	111012 1100	141,50
11.5	142	94	0.14	111010 1150	118,50	111011 1150	176,50	111012 1150	152,50
12	151	101	0.14	111010 1200	118,50	111011 1200	181,50	111012 1200	166,50
13	151	101	0.18	111010 1300	143,-	111011 1300	206,-	111012 1300	194,50

1154

1154

1154

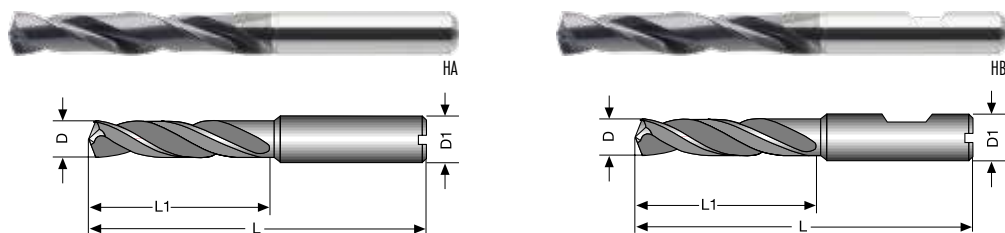
# ATORN® TiAlNplus HPC 5D solid carbide high-performance drill bit without internal cooling



- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **Cutting material: Solid carbide ultra-fine grain TiAlNplus**
- Efficient drilling in different materials
- Newly developed geometry in conjunction with a customised multilayer coating for enhanced performance
- Special cutting edge finishing reduces micro-nicks and increases service life
- **Without internal cooling**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●	○	●	●	●	●	●	●	●	○		●	○	○
		110-145	85-110	55-85	40	45	30	125-155	120	35-40	30	25	260	180	125		40-55	25-35	25

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7	D1 h6	L	L1	Feed f	HA	HB
mm	mm	mm	mm	steel < 1000 N/mm²	art.no.	art.no.
				mm/rev	€	€
1	4	55	8	0.03	111566 0100 62,10	
1.1	4	55	12	0.03	111566 0110 62,10	
1.2	4	55	12	0.03	111566 0120 62,10	
1.3	4	55	12	0.03	111566 0130 62,10	
1.4	4	55	12	0.04	111566 0140 62,10	
1.5	4	55	12	0.04	111566 0150 62,10	
1.6	4	55	16	0.04	111566 0160 62,10	
1.7	4	55	16	0.04	111566 0170 62,10	
1.8	4	55	16	0.05	111566 0180 62,10	
1.9	4	55	16	0.05	111566 0190 62,10	
2	4	57	21	0.05	111566 0200 62,10	
2.05	4	57	21	0.05	111566 0205 64,10	
2.1	4	57	21	0.05	111566 0210 64,10	
2.2	4	57	21	0.06	111566 0220 64,10	
2.3	4	57	21	0.06	111566 0230 64,10	
2.4	4	57	21	0.06	111566 0240 64,10	
2.5	4	57	21	0.06	111566 0250 64,10	
3	6	66	28	0.08	111566 0300 64,10	111567 0300 64,10
3.1	6	66	28	0.08	111566 0310 66,20	111567 0310 66,20
3.2	6	66	28	0.08	111566 0320 66,20	111567 0320 66,20
3.25	6	66	28	0.08	111566 0325 66,20	111567 0325 66,20
3.3	6	66	28	0.08	111566 0330 66,20	111567 0330 66,20
3.4	6	66	28	0.09	111566 0340 66,20	111567 0340 66,20
3.5	6	66	28	0.09	111566 0350 66,20	111567 0350 66,20
3.6	6	66	28	0.09	111566 0360 66,20	111567 0360 66,20
3.7	6	66	28	0.09	111566 0370 66,20	111567 0370 66,20
3.8	6	74	36	0.10	111566 0380 66,20	111567 0380 66,20
3.9	6	74	36	0.10	111566 0390 66,20	111567 0390 66,20
4	6	74	36	0.10	111566 0400 66,20	111567 0400 66,20
4.1	6	74	36	0.10	111566 0410 66,20	111567 0410 66,20
4.2	6	74	36	0.11	111566 0420 66,20	111567 0420 66,20
4.3	6	74	36	0.11	111566 0430 66,20	111567 0430 66,20
4.4	6	74	36	0.11	111566 0440 66,20	111567 0440 66,20
4.5	6	74	36	0.11	111566 0450 66,20	111567 0450 66,20
4.6	6	74	36	0.12	111566 0460 66,20	111567 0460 66,20
4.65	6	74	36	0.12	111566 0465 66,20	111567 0465 66,20

D h7	D1 h6	L	L1	Feed f	HA	HB
mm	mm	mm	mm	steel < 1000 N/mm²	art.no.	art.no.
				mm/rev	€	€
4.7	6	74	36	0.12	111566 0470 66,20	111567 0470 66,20
4.8	6	82	44	0.12	111566 0480 66,20	111567 0480 66,20
4.9	6	82	44	0.12	111566 0490 66,20	111567 0490 66,20
5	6	82	44	0.13	111566 0500 66,20	111567 0500 66,20
5.1	6	82	44	0.13	111566 0510 67,20	111567 0510 67,20
5.2	6	82	44	0.13	111566 0520 67,20	111567 0520 67,20
5.3	6	82	44	0.13	111566 0530 67,20	111567 0530 67,20
5.4	6	82	44	0.14	111566 0540 67,20	111567 0540 67,20
5.5	6	82	44	0.14	111566 0550 67,20	111567 0550 67,20
5.55	6	82	44	0.14	111566 0555 67,20	111567 0555 67,20
5.6	6	82	44	0.14	111566 0560 67,20	111567 0560 67,20
5.65	6	82	44	0.14	111566 0565 67,20	111567 0565 67,20
5.7	6	82	44	0.14	111566 0570 67,20	111567 0570 67,20
5.8	6	82	44	0.15	111566 0580 67,20	111567 0580 67,20
5.9	6	82	44	0.15	111566 0590 67,20	111567 0590 67,20
6	6	82	44	0.15	111566 0600 67,20	111567 0600 67,20
6.1	8	91	53	0.15	111566 0610 72,30	111567 0610 72,30
6.2	8	91	53	0.16	111566 0620 72,30	111567 0620 72,30
6.3	8	91	53	0.16	111566 0630 72,30	111567 0630 72,30
6.4	8	91	53	0.16	111566 0640 72,30	111567 0640 72,30
6.5	8	91	53	0.16	111566 0650 72,30	111567 0650 72,30
6.6	8	91	53	0.17	111566 0660 72,30	111567 0660 72,30
6.7	8	91	53	0.17	111566 0670 72,30	111567 0670 72,30
6.8	8	91	53	0.17	111566 0680 72,30	111567 0680 72,30
6.9	8	91	53	0.17	111566 0690 72,30	111567 0690 72,30
7	8	91	53	0.18	111566 0700 72,30	111567 0700 72,30
7.1	8	91	53	0.18	111566 0710 74,30	111567 0710 74,30
7.2	8	91	53	0.18	111566 0720 74,30	111567 0720 74,30
7.3	8	91	53	0.18	111566 0730 74,30	111567 0730 74,30
7.4	8	91	53	0.19	111566 0740 74,30	111567 0740 74,30
7.5	8	91	53	0.19	111566 0750 74,30	111567 0750 74,30
7.55	8	91	53	0.19	111566 0755 74,30	111567 0755 74,30
7.6	8	91	53	0.19	111566 0760 74,30	111567 0760 74,30
7.65	8	91	53	0.19	111566 0765 74,30	111567 0765 74,30
7.7	8	91	53	0.19	111566 0770 74,30	111567 0770 74,30
7.8	8	91	53	0.20	111566 0780 74,30	111567 0780 74,30

1111

1111

1111

1111

Continued on next page >>>



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA art.no.	€	HB art.no.	€
7.9	8	91	53	0.20	111566 0790	74,30	111567 0790	74,30
8	8	91	53	0.20	111566 0800	74,30	111567 0800	74,30
8.1	10	103	61	0.20	111566 0810	84,50	111567 0810	84,50
8.2	10	103	61	0.21	111566 0820	84,50	111567 0820	84,50
8.3	10	103	61	0.21	111566 0830	84,50	111567 0830	84,50
8.4	10	103	61	0.21	111566 0840	84,50	111567 0840	84,50
8.5	10	103	61	0.21	111566 0850	84,50	111567 0850	84,50
8.6	10	103	61	0.22	111566 0860	84,50	111567 0860	84,50
8.7	10	103	61	0.22	111566 0870	84,50	111567 0870	84,50
8.8	10	103	61	0.22	111566 0880	84,50	111567 0880	84,50
8.9	10	103	61	0.22	111566 0890	84,50	111567 0890	84,50
9	10	103	61	0.23	111566 0900	84,50	111567 0900	84,50
9.1	10	103	61	0.23	111566 0910	85,50	111567 0910	85,50
9.2	10	103	61	0.23	111566 0920	85,50	111567 0920	85,50
9.3	10	103	61	0.23	111566 0930	85,50	111567 0930	85,50
9.4	10	103	61	0.24	111566 0940	85,50	111567 0940	85,50
9.5	10	103	61	0.24	111566 0950	85,50	111567 0950	85,50
9.6	10	103	61	0.24	111566 0960	85,50	111567 0960	85,50
9.7	10	103	61	0.24	111566 0970	85,50	111567 0970	85,50
9.8	10	103	61	0.25	111566 0980	85,50	111567 0980	85,50
9.9	10	103	61	0.25	111566 0990	85,50	111567 0990	85,50
10	10	103	61	0.25	111566 1000	85,50	111567 1000	85,50
10.1	12	118	71	0.25	111566 1010	122,50	111567 1010	122,50
10.2	12	118	71	0.26	111566 1020	122,50	111567 1020	122,50
10.3	12	118	71	0.26	111566 1030	122,50	111567 1030	122,50
10.4	12	118	71	0.26	111566 1040	122,50	111567 1040	122,50
10.5	12	118	71	0.26	111566 1050	122,50	111567 1050	122,50
10.6	12	118	71	0.27	111566 1060	122,50	111567 1060	122,50
10.7	12	118	71	0.27	111566 1070	122,50	111567 1070	122,50
10.8	12	118	71	0.27	111566 1080	122,50	111567 1080	122,50
10.9	12	118	71	0.27	111566 1090	122,50	111567 1090	122,50
11	12	118	71	0.28	111566 1100	122,50	111567 1100	122,50
11.1	12	118	71	0.28	111566 1110	124,50	111567 1110	124,50
11.2	12	118	71	0.28	111566 1120	124,50	111567 1120	124,50
11.3	12	118	71	0.28	111566 1130	124,50	111567 1130	124,50

1111

1111

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA art.no.	€	HB art.no.	€
11.4	12	118	71	0.29	111566 1140	124,50	111567 1140	124,50
11.5	12	118	71	0.29	111566 1150	124,50	111567 1150	124,50
11.6	12	118	71	0.29	111566 1160	124,50	111567 1160	124,50
11.7	12	118	71	0.29	111566 1170	124,50	111567 1170	124,50
11.8	12	118	71	0.30	111566 1180	124,50	111567 1180	124,50
11.9	12	118	71	0.30	111566 1190	124,50	111567 1190	124,50
12	12	118	71	0.30	111566 1200	124,50	111567 1200	124,50
12.1	14	124	77	0.30	111566 1210	155,-	111567 1210	155,-
12.2	14	124	77	0.31	111566 1220	155,-	111567 1220	155,-
12.5	14	124	77	0.31	111566 1250	155,-	111567 1250	155,-
12.8	14	124	77	0.32	111566 1280	155,-	111567 1280	155,-
13	14	124	77	0.33	111566 1300	155,-	111567 1300	155,-
13.2	14	124	77	0.33	111566 1320	161,-	111567 1320	161,-
13.5	14	124	77	0.34	111566 1350	161,-	111567 1350	161,-
13.8	14	124	77	0.35	111566 1380	161,-	111567 1380	161,-
14	14	124	77	0.35	111566 1400	161,-	111567 1400	161,-
14.2	16	133	83	0.36	111566 1420	191,50	111567 1420	191,50
14.4	16	133	83	0.36	111566 1440	191,50	111567 1440	191,50
14.5	16	133	83	0.36	111566 1450	191,50	111567 1450	191,50
14.8	16	133	83	0.37	111566 1480	191,50	111567 1480	191,50
15	16	133	83	0.38	111566 1500	191,50	111567 1500	191,50
15.2	16	133	83	0.38	111566 1520	191,50	111567 1520	191,50
15.5	16	133	83	0.39	111566 1550	191,50	111567 1550	191,50
15.8	16	133	83	0.40	111566 1580	191,50	111567 1580	191,50
16	16	133	83	0.40	111566 1600	191,50	111567 1600	191,50
16.5	18	143	93	0.41	111566 1650	336,-	111567 1650	336,-
17	18	143	93	0.43	111566 1700	336,-	111567 1700	336,-
17.5	18	143	93	0.44	111566 1750	336,-	111567 1750	336,-
18	18	143	93	0.45	111566 1800	336,-	111567 1800	336,-
18.5	20	153	101	0.46	111566 1850	336,-	111567 1850	336,-
18.9	20	153	101	0.47	111566 1890	336,-	111567 1890	336,-
19	20	153	101	0.48	111566 1900	336,-	111567 1900	336,-
19.5	20	153	101	0.49	111566 1950	336,-	111567 1950	336,-
20	20	153	101	0.50	111566 2000	336,-	111567 2000	336,-

1111

1111

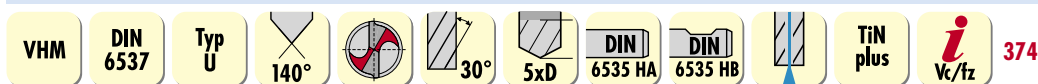
**WHEN  
ADDITIVE  
IS A FAMILIAR WORD IN  
MANUFACTURING.**

**THAT'S POWER TO PRODUCE**

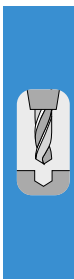
**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE



# SARA® TiNplus HPC 5D solid carbide high-performance drill bit with internal cooling

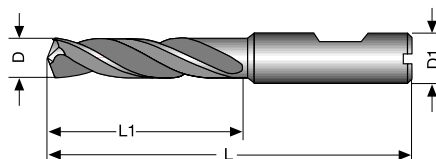


- Newly developed geometry with reinforced core and special point thinning
- Solid carbide ultra-fine grain cutting material TiNplus** (TiAlN+TiN)
- Modern multi-layer hard coating for maximum service life and optimum chip transport
- High centring accuracy
- For universal applications**
- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- With internal cooling**
- Shank designs up to Ø 2.9 mm HA, from Ø 3.0 mm HB



material	● very well suited	steel			stainless steel			cast iron			titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		110-150	75-110	60-95	40	50	40	145	110	36-40	36	32	230-280	200	110		50	32		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
1	3	55	10	0.03	111512 0010	53,80
1.1	3	55	12	0.03	111512 0011	53,80
1.2	3	55	12	0.03	111512 0012	53,80
1.3	3	55	12	0.03	111512 0013	53,80
1.4	3	55	12	0.04	111512 0014	53,80
1.5	3	55	12	0.04	111512 0015	53,80
1.6	3	55	16	0.04	111512 0016	53,80
1.7	3	55	16	0.04	111512 0017	53,80
1.8	3	55	16	0.05	111512 0018	53,80
1.9	3	55	16	0.05	111512 0019	53,80
2	3	57	16	0.05	111512 0020	53,80
2.1	3	57	21	0.05	111512 0021	53,80
2.2	3	57	21	0.06	111512 0022	53,80
2.3	3	57	21	0.06	111512 0023	53,80
2.4	3	57	21	0.06	111512 0024	53,80
2.5	3	57	21	0.06	111512 0025	53,80
2.6	3	57	21	0.07	111512 0026	53,80
2.7	3	57	21	0.07	111512 0027	53,80
2.8	3	57	21	0.07	111512 0028	53,80
2.9	3	57	21	0.07	111512 0029	53,80
3	6	66	28	0.11	111512 0030	49,20
3.1	6	66	28	0.11	111512 0031	49,20
3.2	6	66	28	0.11	111512 0032	49,20
3.25	6	66	28	0.11	111512 0325	49,20
3.3	6	66	28	0.11	111512 0033	49,20
3.4	6	66	28	0.11	111512 0034	49,20
3.5	6	66	28	0.16	111512 0035	49,20
3.6	6	66	28	0.16	111512 0036	49,20
3.7	6	66	28	0.16	111512 0037	49,20
3.8	6	74	36	0.16	111512 0038	49,20
3.9	6	74	36	0.16	111512 0039	49,20
4	6	74	36	0.16	111512 0040	49,20
4.1	6	74	36	0.16	111512 0041	49,20
4.2	6	74	36	0.16	111512 0042	49,20
4.3	6	74	36	0.16	111512 0043	49,20
4.4	6	74	36	0.16	111512 0044	49,20
4.5	6	74	36	0.16	111512 0045	49,20
4.6	6	74	36	0.16	111512 0046	49,20

1156

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
4.65	6	74	36	0.16	111512 0465	49,20
4.7	6	74	36	0.16	111512 0047	49,20
4.8	6	82	44	0.16	111512 0048	49,20
4.9	6	82	44	0.16	111512 0049	49,20
5	6	82	44	0.16	111512 0050	49,20
5.1	6	82	44	0.16	111512 0051	49,20
5.2	6	82	44	0.16	111512 0052	49,20
5.3	6	82	44	0.16	111512 0053	49,20
5.4	6	82	44	0.16	111512 0054	49,20
5.5	6	82	44	0.20	111512 0055	49,20
5.55	6	82	44	0.20	111512 0555	49,20
5.6	6	82	44	0.20	111512 0056	49,20
5.7	6	82	44	0.20	111512 0057	49,20
5.8	6	82	44	0.20	111512 0058	49,20
5.9	6	82	44	0.20	111512 0059	49,20
6	6	82	44	0.20	111512 0060	49,20
6.1	8	91	53	0.20	111512 0061	56,80
6.2	8	91	53	0.20	111512 0062	56,80
6.3	8	91	53	0.20	111512 0063	56,80
6.4	8	91	53	0.20	111512 0064	56,80
6.5	8	91	53	0.20	111512 0065	56,80
6.6	8	91	53	0.20	111512 0066	56,80
6.7	8	91	53	0.20	111512 0067	56,80
6.8	8	91	53	0.20	111512 0068	56,80
6.9	8	91	53	0.20	111512 0069	56,80
7	8	91	53	0.20	111512 0070	56,80
7.1	8	91	53	0.25	111512 0071	56,80
7.2	8	91	53	0.25	111512 0072	56,80
7.3	8	91	53	0.25	111512 0073	56,80
7.4	8	91	53	0.25	111512 0074	56,80
7.5	8	91	53	0.25	111512 0075	56,80
7.6	8	91	53	0.25	111512 0076	56,80
7.7	8	91	53	0.25	111512 0077	56,80
7.8	8	91	53	0.25	111512 0078	56,80
7.9	8	91	53	0.25	111512 0079	56,80
8	8	91	53	0.25	111512 0080	56,80
8.1	10	103	61	0.25	111512 0081	63,90
8.2	10	103	61	0.25	111512 0082	63,90

1156

Continued on next page >>>

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
8.3	10	103	61	0.25	111512 0083	63,90
8.4	10	103	61	0.25	111512 0084	63,90
8.5	10	103	61	0.25	111512 0085	63,90
8.6	10	103	61	0.25	111512 0086	63,90
8.7	10	103	61	0.25	111512 0087	63,90
8.8	10	103	61	0.25	111512 0088	63,90
8.9	10	103	61	0.25	111512 0089	63,90
9	10	103	61	0.25	111512 0090	63,90
9.1	10	103	61	0.32	111512 0091	63,90
9.2	10	103	61	0.32	111512 0092	63,90
9.3	10	103	61	0.32	111512 0093	63,90
9.4	10	103	61	0.32	111512 0094	63,90
9.5	10	103	61	0.32	111512 0095	63,90
9.6	10	103	61	0.32	111512 0096	63,90
9.7	10	103	61	0.32	111512 0097	63,90
9.8	10	103	61	0.32	111512 0098	63,90
9.9	10	103	61	0.32	111512 0099	63,90
10	10	103	61	0.32	111512 0100	63,90
10.1	12	118	71	0.32	111512 0101	89,50
10.2	12	118	71	0.32	111512 0102	89,50
10.3	12	118	71	0.32	111512 0103	89,50
10.4	12	118	71	0.32	111512 0104	89,50
10.5	12	118	71	0.32	111512 0105	89,50
10.8	12	118	71	0.32	111512 0108	89,50
11	12	118	71	0.32	111512 0110	89,50
11.1	12	118	71	0.32	111512 0111	89,50
11.2	12	118	71	0.32	111512 0112	89,50
11.3	12	118	71	0.32	111512 0113	89,50

1156

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
11.5	12	118	71	0.32	111512 0115	89,50
11.8	12	118	71	0.32	111512 0118	89,50
12	12	118	71	0.32	111512 0120	89,50
12.2	14	124	77	0.32	111512 0122	89,50
12.5	14	124	77	0.32	111512 0125	122,50
12.8	14	124	77	0.32	111512 0128	122,50
13	14	124	77	0.32	111512 0130	122,50
13.5	14	124	77	0.32	111512 0135	122,50
13.8	14	124	77	0.32	111512 0138	122,50
13.9	14	124	77	0.32	111512 0139	122,50
14	14	124	77	0.32	111512 0140	122,50
14.2	16	133	83	0.32	111512 0142	157,50
14.5	16	133	83	0.32	111512 0145	157,50
14.8	16	133	83	0.32	111512 0148	157,50
15	16	133	83	0.32	111512 0150	157,50
15.2	16	133	83	0.40	111512 0152	157,50
15.5	16	133	83	0.40	111512 0155	157,50
15.7	16	133	83	0.40	111512 0157	157,50
15.8	16	133	83	0.40	111512 0158	157,50
16	16	133	83	0.40	111512 0160	157,50
16.5	18	143	93	0.40	111512 0165	246,-
17	18	143	93	0.40	111512 0170	246,-
17.5	18	143	93	0.40	111512 0175	246,-
18	18	143	93	0.40	111512 0180	246,-
18.5	20	153	101	0.50	111512 0185	268,-
19	20	153	101	0.50	111512 0190	268,-
19.5	20	153	101	0.50	111512 0195	268,-
20	20	153	101	0.50	111512 0200	268,-

1156



Grooving from 2 mm ...

... with internal cooling.

**ATORN**<sup>®</sup>  
Performance demands quality

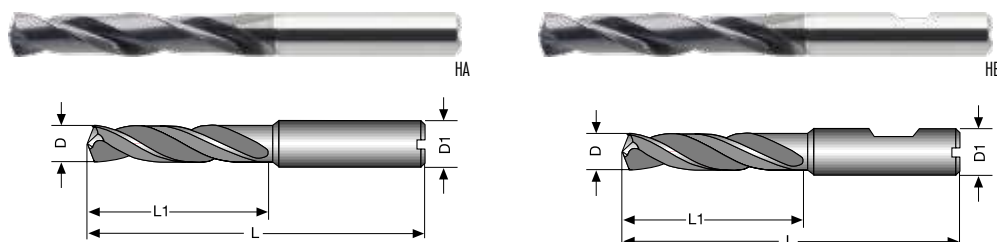
# ATORN® TiAlNplus HPC 5D solid carbide high-performance drill bit with internal cooling



- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **Cutting material: Solid carbide ultra-fine grain TiAlNplus**
- Efficient drilling in different materials
- Newly developed geometry in conjunction with a customised multilayer coating for enhanced performance
- Special cutting edge finishing reduces micro-nicks and increases service life
- **With internal cooling**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 40 HRc	≥ 40 HRc	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		120-170	85-120	65-105	45	55	44	160	120	40-45	40	35	260-310	220	125		55	35	30

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7	D1 h6	L	L1	Feed f	HA		HB	
mm	mm	mm	mm	steel < 1000 N/mm² mm/rev	art.no.	€	art.no.	€
1	4	55	8	0.03	111568 0100	77,30		
1.1	4	55	12	0.03	111568 0110	77,30		
1.2	4	55	12	0.03	111568 0120	77,30		
1.3	4	55	12	0.03	111568 0130	77,30		
1.4	4	55	12	0.04	111568 0140	77,30		
1.5	4	55	12	0.04	111568 0150	77,30		
1.6	4	55	16	0.04	111568 0160	77,30		
1.7	4	55	16	0.04	111568 0170	77,30		
1.8	4	55	16	0.05	111568 0180	77,30		
1.9	4	55	16	0.05	111568 0190	77,30		
2.0	4	57	21	0.05	111568 0200	77,30		
2.1	4	57	21	0.05	111568 0210	77,30		
2.2	4	57	21	0.06	111568 0220	77,30		
2.3	4	57	21	0.06	111568 0230	77,30		
2.4	4	57	21	0.06	111568 0240	77,30		
2.5	4	57	21	0.06	111568 0250	77,30		
2.6	4	57	21	0.07	111568 0260	77,30		
2.7	4	57	21	0.07	111568 0270	77,30		
2.8	4	57	21	0.07	111568 0280	77,30		
2.9	4	57	21	0.07	111568 0290	77,30		
3	6	66	28	0.08	111568 0300	77,30	111569 0300	77,30
3.1	6	66	28	0.08	111568 0310	77,30	111569 0310	77,30
3.2	6	66	28	0.08	111568 0320	77,30	111569 0320	77,30
3.25	6	66	28	0.08	111568 0325	77,30	111569 0325	77,30
3.3	6	66	28	0.08	111568 0330	77,30	111569 0330	77,30
3.4	6	66	28	0.09	111568 0340	77,30	111569 0340	77,30
3.5	6	66	28	0.09	111568 0350	77,30	111569 0350	77,30
3.6	6	66	28	0.09	111568 0360	77,30	111569 0360	77,30
3.7	6	66	28	0.09	111568 0370	77,30	111569 0370	77,30
3.8	6	74	36	0.10	111568 0380	77,30	111569 0380	77,30
3.85	6	74	36	0.10	111568 0385	77,30	111569 0385	77,30
3.9	6	74	36	0.10	111568 0390	77,30	111569 0390	77,30
4	6	74	36	0.10	111568 0400	77,30	111569 0400	77,30
4.1	6	74	36	0.10	111568 0410	78,40	111569 0410	78,40
4.2	6	74	36	0.11	111568 0420	78,40	111569 0420	78,40

D h7	D1 h6	L	L1	Feed f	HA		HB	
mm	mm	mm	mm	steel < 1000 N/mm² mm/rev	art.no.	€	art.no.	€
4.3	6	74	36	0.11	111568 0430	78,40	111569 0430	78,40
4.4	6	74	36	0.11	111568 0440	78,40	111569 0440	78,40
4.5	6	74	36	0.11	111568 0450	78,40	111569 0450	78,40
4.6	6	74	36	0.12	111568 0460	78,40	111569 0460	78,40
4.65	6	74	36	0.12	111568 0465	78,40	111569 0465	78,40
4.7	6	74	36	0.12	111568 0470	78,40	111569 0470	78,40
4.8	6	82	44	0.12	111568 0480	78,40	111569 0480	78,40
4.9	6	82	44	0.12	111568 0490	78,40	111569 0490	78,40
5	6	82	44	0.13	111568 0500	78,40	111569 0500	78,40
5.1	6	82	44	0.13	111568 0510	78,40	111569 0510	78,40
5.2	6	82	44	0.13	111568 0520	78,40	111569 0520	78,40
5.3	6	82	44	0.13	111568 0530	78,40	111569 0530	78,40
5.4	6	82	44	0.14	111568 0540	78,40	111569 0540	78,40
5.5	6	82	44	0.14	111568 0550	78,40	111569 0550	78,40
5.6	6	82	44	0.14	111568 0560	78,40	111569 0560	78,40
5.65	6	82	44	0.14	111568 0565	78,40	111569 0565	78,40
5.7	6	82	44	0.14	111568 0570	78,40	111569 0570	78,40
5.8	6	82	44	0.15	111568 0580	78,40	111569 0580	78,40
5.9	6	82	44	0.15	111568 0590	78,40	111569 0590	78,40
6	6	82	44	0.15	111568 0600	78,40	111569 0600	78,40
6.1	8	91	53	0.15	111568 0610	86,50	111569 0610	86,50
6.2	8	91	53	0.16	111568 0620	86,50	111569 0620	86,50
6.3	8	91	53	0.16	111568 0630	86,50	111569 0630	86,50
6.4	8	91	53	0.16	111568 0640	86,50	111569 0640	86,50
6.5	8	91	53	0.16	111568 0650	86,50	111569 0650	86,50
6.6	8	91	53	0.17	111568 0660	86,50	111569 0660	86,50
6.7	8	91	53	0.17	111568 0670	86,50	111569 0670	86,50
6.8	8	91	53	0.17	111568 0680	86,50	111569 0680	86,50
6.9	8	91	53	0.17	111568 0690	86,50	111569 0690	86,50
7	8	91	53	0.18	111568 0700	86,50	111569 0700	86,50
7.1	8	91	53	0.18	111568 0710	86,50	111569 0710	86,50
7.2	8	91	53	0.18	111568 0720	86,50	111569 0720	86,50
7.3	8	91	53	0.18	111568 0730	86,50	111569 0730	86,50
7.4	8	91	53	0.19	111568 0740	86,50	111569 0740	86,50

1111

1111

1111

1111

Continued on next page >>>



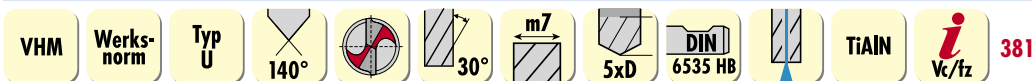
D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA		HB	
					art.no.	€	art.no.	€
7.5	8	91	53	0.19	111568 0750	86,50	111569 0750	86,50
7.55	8	91	53	0.19	111568 0755	86,50	111569 0755	86,50
7.6	8	91	53	0.19	111568 0760	86,50	111569 0760	86,50
7.65	8	91	53	0.19	111568 0765	86,50	111569 0765	86,50
7.7	8	91	53	0.19	111568 0770	86,50	111569 0770	86,50
7.8	8	91	53	0.20	111568 0780	86,50	111569 0780	86,50
7.9	8	91	53	0.20	111568 0790	86,50	111569 0790	86,50
8	8	91	53	0.20	111568 0800	86,50	111569 0800	86,50
8.1	10	103	61	0.20	111568 0810	101,50	111569 0810	101,50
8.2	10	103	61	0.21	111568 0820	101,50	111569 0820	101,50
8.3	10	103	61	0.21	111568 0830	101,50	111569 0830	101,50
8.4	10	103	61	0.21	111568 0840	101,50	111569 0840	101,50
8.5	10	103	61	0.21	111568 0850	101,50	111569 0850	101,50
8.6	10	103	61	0.22	111568 0860	101,50	111569 0860	101,50
8.7	10	103	61	0.22	111568 0870	101,50	111569 0870	101,50
8.8	10	103	61	0.22	111568 0880	101,50	111569 0880	101,50
8.9	10	103	61	0.22	111568 0890	101,50	111569 0890	101,50
9	10	103	61	0.23	111568 0900	101,50	111569 0900	101,50
9.1	10	103	61	0.23	111568 0910	101,50	111569 0910	101,50
9.2	10	103	61	0.23	111568 0920	101,50	111569 0920	101,50
9.3	10	103	61	0.23	111568 0930	101,50	111569 0930	101,50
9.4	10	103	61	0.24	111568 0940	101,50	111569 0940	101,50
9.5	10	103	61	0.24	111568 0950	101,50	111569 0950	101,50
9.55	10	103	61	0.24	111568 0955	101,50	111569 0955	101,50
9.6	10	103	61	0.24	111568 0960	101,50	111569 0960	101,50
9.7	10	103	61	0.24	111568 0970	101,50	111569 0970	101,50
9.8	10	103	61	0.25	111568 0980	101,50	111569 0980	101,50
9.9	10	103	61	0.25	111568 0990	101,50	111569 0990	101,50
10	10	103	61	0.25	111568 1000	101,50	111569 1000	101,50
10.1	12	118	71	0.25	111568 1010	144,50	111569 1010	144,50
10.2	12	118	71	0.26	111568 1020	144,50	111569 1020	144,50
10.3	12	118	71	0.26	111568 1030	144,50	111569 1030	144,50
10.4	12	118	71	0.26	111568 1040	144,50	111569 1040	144,50
10.5	12	118	71	0.26	111568 1050	144,50	111569 1050	144,50
10.6	12	118	71	0.27	111568 1060	144,50	111569 1060	144,50
10.7	12	118	71	0.27	111568 1070	144,50	111569 1070	144,50
10.8	12	118	71	0.27	111568 1080	144,50	111569 1080	144,50
10.9	12	118	71	0.27	111568 1090	144,50	111569 1090	144,50
11	12	118	71	0.28	111568 1100	144,50	111569 1100	144,50
11.1	12	118	71	0.28	111568 1110	144,50	111569 1110	144,50
11.2	12	118	71	0.28	111568 1120	144,50	111569 1120	144,50
11.3	12	118	71	0.28	111568 1130	144,50	111569 1130	144,50
11.4	12	118	71	0.29	111568 1140	144,50	111569 1140	144,50
11.5	12	118	71	0.29	111568 1150	144,50	111569 1150	144,50
11.6	12	118	71	0.29	111568 1160	144,50	111569 1160	144,50
11.7	12	118	71	0.29	111568 1170	144,50	111569 1170	144,50
					1111		1111	

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	HA		HB	
					art.no.	€	art.no.	€
11.8	12	118	71	0.30	111568 1180	144,50	111569 1180	144,50
11.9	12	118	71	0.30	111568 1190	144,50	111569 1190	144,50
12	12	118	71	0.30	111568 1200	144,50	111569 1200	144,50
12.1	14	124	77	0.30	111568 1210	193,50	111569 1210	193,50
12.2	14	124	77	0.31	111568 1220	193,50	111569 1220	193,50
12.4	14	124	77	0.31	111568 1240	193,50	111569 1240	193,50
12.5	14	124	77	0.31	111568 1250	193,50	111569 1250	193,50
12.6	14	124	77	0.32	111568 1260	193,50	111569 1260	193,50
12.8	14	124	77	0.32	111568 1280	193,50	111569 1280	193,50
13	14	124	77	0.33	111568 1300	193,50	111569 1300	193,50
13.1	14	124	77	0.33	111568 1310	193,50	111569 1310	193,50
13.2	14	124	77	0.33	111568 1320	193,50	111569 1320	193,50
13.3	14	124	77	0.33	111568 1330	193,50	111569 1330	193,50
13.5	14	124	77	0.34	111568 1350	193,50	111569 1350	193,50
13.8	14	124	77	0.35	111568 1380	193,50	111569 1380	193,50
14	14	124	77	0.35	111568 1400	193,50	111569 1400	193,50
14.2	16	133	83	0.36	111568 1420	228,-	111569 1420	228,-
14.3	16	133	83	0.36	111568 1430	228,-	111569 1430	228,-
14.4	16	133	83	0.36	111568 1440	228,-	111569 1440	228,-
14.5	16	133	83	0.36	111568 1450	228,-	111569 1450	228,-
14.8	16	133	83	0.37	111568 1480	228,-	111569 1480	228,-
15	16	133	83	0.38	111568 1500	228,-	111569 1500	228,-
15.1	16	133	83	0.38	111568 1510	228,-	111569 1510	228,-
15.2	16	133	83	0.38	111568 1520	228,-	111569 1520	228,-
15.25	16	133	83	0.38	111568 1525	228,-	111569 1525	228,-
15.3	16	133	83	0.38	111568 1530	228,-	111569 1530	228,-
15.5	16	133	83	0.39	111568 1550	228,-	111569 1550	228,-
15.8	16	133	83	0.40	111568 1580	228,-	111569 1580	228,-
16	16	133	83	0.40	111568 1600	228,-	111569 1600	228,-
16.2	18	143	93	0.41	111568 1620	365,-	111569 1620	365,-
16.3	18	143	93	0.41	111568 1630	365,-	111569 1630	365,-
16.5	18	143	93	0.41	111568 1650	365,-	111569 1650	365,-
16.8	18	143	93	0.42	111568 1680	365,-	111569 1680	365,-
17	18	143	93	0.43	111568 1700	365,-	111569 1700	365,-
17.3	18	143	93	0.43	111568 1730	365,-	111569 1730	365,-
17.5	18	143	93	0.44	111568 1750	365,-	111569 1750	365,-
18	18	143	93	0.45	111568 1800	365,-	111569 1800	365,-
18.5	20	153	101	0.46	111568 1850	385,-	111569 1850	385,-
18.9	20	153	101	0.47	111568 1890	385,-	111569 1890	385,-
19	20	153	101	0.48	111568 1900	385,-	111569 1900	385,-
19.2	20	153	101	0.48	111568 1920	399,-	111569 1920	399,-
19.3	20	153	101	0.48	111568 1930	399,-	111569 1930	399,-
19.5	20	153	101	0.49	111568 1950	399,-	111569 1950	399,-
19.7	20	153	101	0.49	111568 1970	399,-	111569 1970	399,-
20	20	153	101	0.50	111568 2000	399,-	111569 2000	399,-
					1111		1111	



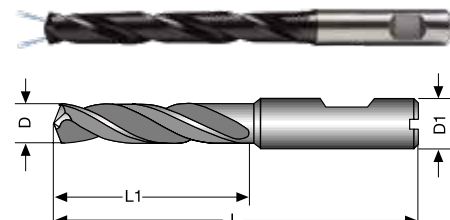
# HYP-HPO-5D solid carbide high-performance drill bit

NEW



- Universal geometry
- **Cutting material: Solid carbide WDI coating (TiAlN)**
- With internal cooling

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Co-alloy	GRP/EP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○		●	●	○	○	○	○	○		○	○	
		100-150	70-110	50-60	40-50	40-50		150-200	100-150	15-25	15-25	120-220	60-110	50-90		15-25	15-20	
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		



D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	6	66	28	0.06	111629 0300	38,50
3.1	6	66	28	0.06	111629 0310	38,50
3.17 (1/8)	6	66	28	0.06	111629 0317	53,50
3.2	6	66	28	0.06	111629 0320	38,50
3.3	6	66	28	0.07	111629 0330	38,50
3.4	6	66	28	0.07	111629 0340	38,50
3.5	6	66	28	0.07	111629 0350	38,50
3.57 (9/64)	6	66	28	0.07	111629 0357	53,50
3.6	6	66	28	0.07	111629 0360	38,50
3.7	6	66	28	0.07	111629 0370	38,50
3.8	6	74	36	0.08	111629 0380	38,50
3.9	6	74	36	0.08	111629 0390	38,50
3.97 (5/32)	6	74	36	0.08	111629 0397	53,50
4	6	74	36	0.08	111629 0400	38,50
4.1	6	74	36	0.08	111629 0410	38,50
4.2	6	74	36	0.08	111629 0420	38,50
4.3	6	74	36	0.09	111629 0430	38,50
4.37 (11/64)	6	74	36	0.09	111629 0437	53,50
4.4	6	74	36	0.09	111629 0440	38,50
4.5	6	74	36	0.09	111629 0450	38,50
4.6	6	74	36	0.09	111629 0460	38,50
4.65	6	74	36	0.09	111629 0465	38,50
4.7	6	82	44	0.09	111629 0470	38,50
4.76 (3/16)	6	82	44	0.10	111629 0476	53,50
4.8	6	82	44	0.10	111629 0480	38,50
4.9	6	82	44	0.10	111629 0490	38,50
5	6	82	44	0.10	111629 0500	38,50
5.1	6	82	44	0.10	111629 0510	38,50
5.16 (13/64)	6	82	44	0.10	111629 0516	53,50
5.2	6	82	44	0.10	111629 0520	38,50
5.3	6	82	44	0.11	111629 0530	38,50
5.4	6	82	44	0.11	111629 0540	38,50
5.5	6	82	44	0.11	111629 0555	38,50
5.56 (7/32)	6	82	44	0.11	111629 0556	53,50
5.6	6	82	44	0.11	111629 0560	38,50
5.7	6	82	44	0.11	111629 0570	38,50
5.8	6	82	44	0.12	111629 0580	38,50
5.9	6	82	44	0.12	111629 0590	38,50

1107

D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
5.95 (15/64)	6	82	44	0.12	111629 0595	53,50
6	6	82	44	0.12	111629 0600	38,50
6.1	8	91	53	0.12	111629 0610	46,75
6.2	8	91	53	0.12	111629 0620	46,75
6.3	8	91	53	0.13	111629 0630	46,75
6.35 (1/4)	8	91	53	0.13	111629 0635	67,50
6.4	8	91	53	0.13	111629 0640	46,75
6.5	8	91	53	0.13	111629 0650	46,75
6.6	8	91	53	0.13	111629 0660	46,75
6.7	8	91	53	0.13	111629 0670	46,75
6.75 (17/64)	8	91	53	0.14	111629 0675	67,50
6.8	8	91	53	0.14	111629 0680	46,75
6.9	8	91	53	0.14	111629 0690	46,75
7	8	91	53	0.14	111629 0700	46,75
7.1	8	91	53	0.14	111629 0710	46,75
7.14 (9/32)	8	91	53	0.14	111629 0714	67,50
7.2	8	91	53	0.14	111629 0720	46,75
7.3	8	91	53	0.15	111629 0730	46,75
7.4	8	91	53	0.15	111629 0740	46,75
7.5	8	91	53	0.15	111629 0750	46,75
7.54 (19/64)	8	91	53	0.15	111629 0754	67,50
7.6	8	91	53	0.15	111629 0760	46,75
7.7	8	91	53	0.15	111629 0770	46,75
7.8	8	91	53	0.16	111629 0780	46,75
7.9	8	91	53	0.16	111629 0790	46,75
7.94 (5/16)	8	91	53	0.16	111629 0794	67,50
8	8	91	53	0.16	111629 0800	46,75
8.1	8	103	61	0.16	111629 0810	63,50
8.2	10	103	61	0.16	111629 0820	63,50
8.3	10	103	61	0.17	111629 0830	63,50
8.33 (21/64)	10	103	61	0.17	111629 0833	90,50
8.4	10	103	61	0.17	111629 0840	63,50
8.5	10	103	61	0.17	111629 0850	63,50
8.6	10	103	61	0.17	111629 0860	63,50
8.7	10	103	61	0.17	111629 0870	63,50
8.73 (11/32)	10	103	61	0.17	111629 0873	90,50
8.8	10	103	61	0.18	111629 0880	63,50
8.9	10	103	61	0.18	111629 0890	63,50
9	10	103	61	0.18	111629 0900	63,50

1107

Continued on next page >>>



D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
9.1	10	103	61	0.18	111629 0910	63,50
9.13 (23/64)	10	103	61	0.18	111629 0913	90,50
9.2	10	103	61	0.18	111629 0920	63,50
9.3	10	103	61	0.19	111629 0930	63,50
9.4	10	103	61	0.19	111629 0940	63,50
9.5	10	103	61	0.19	111629 0950	63,50
9.52 (3/8)	10	103	61	0.19	111629 0952	90,50
9.6	10	103	61	0.19	111629 0960	63,50
9.7	10	103	61	0.19	111629 0970	63,50
9.8	10	103	61	0.20	111629 0980	63,50
9.9	10	103	61	0.20	111629 0990	63,50
9.92 (25/64)	10	103	61	0.20	111629 0992	90,50
10	10	103	61	0.20	111629 1000	63,50
10.1	12	118	71	0.20	111629 1010	99,50
10.2	12	118	71	0.20	111629 1020	99,50
10.3	12	118	71	0.21	111629 1030	99,50
10.32 (13/32)	12	118	71	0.21	111629 1032	148,-
10.4	12	118	71	0.21	111629 1040	99,50
10.5	12	118	71	0.21	111629 1050	99,50
10.6	12	118	71	0.21	111629 1060	99,50
10.7	12	118	71	0.21	111629 1070	99,50
10.72 (27/64)	12	118	71	0.21	111629 1072	148,-
10.8	12	118	71	0.22	111629 1080	99,50
10.9	12	118	71	0.22	111629 1090	99,50
11	12	118	71	0.22	111629 1100	99,50
11.1	12	118	71	0.22	111629 1110	99,50
11.11 (7/16)	12	118	71	0.22	111629 1111	148,-
11.2	12	118	71	0.22	111629 1120	99,50
11.3	12	118	71	0.23	111629 1130	99,50

1107

D mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
11.4	12	118	71	0.23	111629 1140	99,50
11.5	12	118	71	0.23	111629 1150	99,50
11.51 (29/64)	12	118	71	0.23	111629 1151	148,-
11.6	12	118	71	0.23	111629 1160	99,50
11.7	12	118	71	0.23	111629 1170	99,50
11.8	12	118	71	0.24	111629 1180	99,50
11.9	12	118	71	0.24	111629 1190	99,50
11.91 (15/32)	12	118	71	0.24	111629 1191	148,-
12	12	118	71	0.24	111629 1200	99,50
12.3 (31/64)	14	124	77	0.25	111629 1230	175,-
12.5	14	124	77	0.25	111629 1250	115,-
12.7 (1/2)	14	124	77	0.25	111629 1270	175,-
13	14	124	77	0.26	111629 1300	115,-
13.5	14	124	77	0.27	111629 1350	115,-
14	14	124	77	0.28	111629 1400	115,-
14.29 (9/16)	16	133	83	0.29	111629 1429	224,-
14.5	16	133	83	0.29	111629 1450	148,-
15	16	133	83	0.30	111629 1500	148,-
15.5	16	133	83	0.31	111629 1550	148,-
15.87 (5/8)	16	133	83	0.32	111629 1587	224,-
16	16	133	83	0.32	111629 1600	148,-
16.5	18	143	93	0.33	111629 1650	222,-
17	18	143	93	0.34	111629 1700	222,-
17.5	18	143	93	0.35	111629 1750	222,-
18	18	143	93	0.36	111629 1800	222,-
18.5	20	153	101	0.37	111629 1850	258,-
19	20	153	101	0.38	111629 1900	258,-
19.5	20	153	101	0.39	111629 1950	258,-
20	20	153	101	0.40	111629 2000	258,-

1107

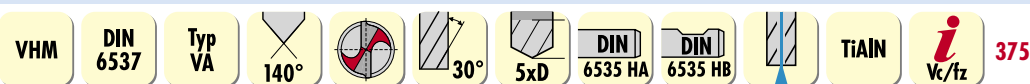


Deep drilling ...

... with brainpower.

**ATORN**<sup>®</sup>  
Performance demands quality

# ATORN® Solid carbide high-performance drill bit Ultra-M 5D



- Special geometry, facet-ground, maximum tool life, high process reliability
- Shank design:

HA with coolant bore, smooth straight shank, DIN 6535 HA

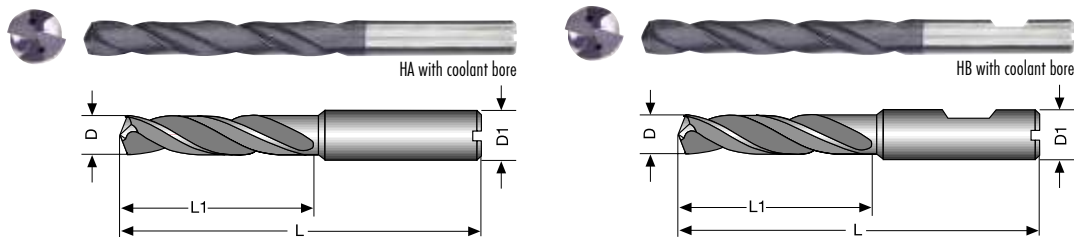
HB with coolant bore straight shank DIN 6535 HB

- **Cutting material: solid carbide, TiAlN-Ultra-M-coated**
- True-running accuracy of the tool when clamped max. 0.02 mm
- **Especially suitable for stainless steel and superalloys**

**Especially for stainless steel**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
					● 80	● 60	● 48			● 35	● 30	● 30								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f stainless steel austenitic mm/rev	HA art.no.	€	HB art.no.	€
3	6	66	28	0.05	111547 0030	70,70	111551 0030	70,70
3.1	6	66	28	0.05	111547 0031	70,70	111551 0031	70,70
3.2	6	66	28	0.05	111547 0032	70,70	111551 0032	70,70
3.25	6	66	28	0.05	111547 1325	70,70	111551 0325	70,70
3.3	6	66	28	0.05	111547 0033	70,70	111551 0033	70,70
3.4	6	66	28	0.05	111547 0034	70,70	111551 0034	70,70
3.5	6	66	28	0.06	111547 0035	70,70	111551 0035	70,70
3.6	6	66	28	0.06	111547 0036	70,70	111551 0036	70,70
3.7	6	66	28	0.06	111547 0037	70,70	111551 0037	70,70
3.8	6	74	36	0.06	111547 0038	70,70	111551 0038	70,70
3.9	6	74	36	0.06	111547 0039	70,70	111551 0039	70,70
4	6	74	36	0.06	111547 0040	70,70	111551 0040	70,70
4.1	6	74	36	0.06	111547 0041	70,70	111551 0041	70,70
4.2	6	74	36	0.06	111547 0042	70,70	111551 0042	70,70
4.3	6	74	36	0.06	111547 0043	70,70	111551 0043	70,70
4.4	6	74	36	0.06	111547 0044	70,70	111551 0044	70,70
4.5	6	74	36	0.06	111547 0045	70,70	111551 0045	70,70
4.6	6	74	36	0.06	111547 0046	70,70	111551 0046	70,70
4.65	6	74	36	0.06	111547 1465	70,70	111551 0465	70,70
4.7	6	74	36	0.06	111547 0047	70,70	111551 0047	70,70
4.8	6	82	44	0.06	111547 0048	70,70	111551 0048	70,70
4.9	6	82	44	0.06	111547 0049	70,70	111551 0049	70,70
5	6	82	44	0.06	111547 0050	70,70	111551 0050	70,70
5.1	6	82	44	0.06	111547 0051	70,70	111551 0051	70,70
5.2	6	82	44	0.06	111547 0052	70,70	111551 0052	70,70
5.3	6	82	44	0.06	111547 0053	70,70	111551 0053	70,70
5.4	6	82	44	0.06	111547 0054	70,70	111551 0054	70,70
5.5	6	82	44	0.08	111547 0055	70,70	111551 0055	70,70
5.55	6	82	44	0.08	111547 1555	70,70	111551 0555	70,70
5.6	6	82	44	0.08	111547 0056	70,70	111551 0056	70,70
5.7	6	82	44	0.08	111547 0057	70,70	111551 0057	70,70
5.8	6	82	44	0.08	111547 0058	70,70	111551 0058	70,70
5.9	6	82	44	0.08	111547 0059	70,70	111551 0059	70,70
6	6	82	44	0.08	111547 0060	70,70	111551 0060	70,70
6.1	8	91	53	0.08	111547 0061	91,10	111551 0061	91,10
6.2	8	91	53	0.08	111547 0062	91,10	111551 0062	91,10

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f stainless steel austenitic mm/rev	HA art.no.	€	HB art.no.	€
6.3	8	91	53	0.08	111547 0063	91,10	111551 0063	91,10
6.4	8	91	53	0.08	111547 0064	91,10	111551 0064	91,10
6.5	8	91	53	0.08	111547 0065	91,10	111551 0065	91,10
6.6	8	91	53	0.08	111547 0066	91,10	111551 0066	91,10
6.7	8	91	53	0.08	111547 0067	91,10	111551 0067	91,10
6.8	8	91	53	0.08	111547 0068	91,10	111551 0068	91,10
6.9	8	91	53	0.08	111547 0069	91,10	111551 0069	91,10
7	8	91	53	0.08	111547 0070	91,10	111551 0070	91,10
7.1	8	91	53	0.10	111547 0071	91,10	111551 0071	91,10
7.2	8	91	53	0.10	111547 0072	91,10	111551 0072	91,10
7.3	8	91	53	0.10	111547 0073	91,10	111551 0073	91,10
7.4	8	91	53	0.10	111547 0074	91,10	111551 0074	91,10
7.5	8	91	53	0.10	111547 0075	91,10	111551 0075	91,10
7.6	8	91	53	0.10	111547 0076	91,10	111551 0076	91,10
7.7	8	91	53	0.10	111547 0077	91,10	111551 0077	91,10
7.8	8	91	53	0.10	111547 0078	91,10	111551 0078	91,10
7.9	8	91	53	0.10	111547 0079	91,10	111551 0079	91,10
8	8	91	53	0.10	111547 0080	91,10	111551 0080	91,10
8.1	10	103	61	0.10	111547 0081	111,-	111551 0081	111,-
8.2	10	103	61	0.10	111547 0082	111,-	111551 0082	111,-
8.3	10	103	61	0.10	111547 0083	111,-	111551 0083	111,-
8.4	10	103	61	0.10	111547 0084	111,-	111551 0084	111,-
8.5	10	103	61	0.10	111547 0085	111,-	111551 0085	111,-
8.6	10	103	61	0.10	111547 0086	111,-	111551 0086	111,-
8.7	10	103	61	0.10	111547 0087	111,-	111551 0087	111,-
8.8	10	103	61	0.10	111547 0088	111,-	111551 0088	111,-
8.9	10	103	61	0.10	111547 0089	111,-	111551 0089	111,-
9	10	103	61	0.10	111547 0090	111,-	111551 0090	111,-
9.1	10	103	61	0.12	111547 0091	111,-	111551 0091	111,-
9.2	10	103	61	0.12	111547 0092	111,-	111551 0092	111,-
9.3	10	103	61	0.12	111547 0093	111,-	111551 0093	111,-
9.4	10	103	61	0.12	111547 0094	111,-	111551 0094	111,-
9.5	10	103	61	0.12	111547 0095	111,-	111551 0095	111,-
9.6	10	103	61	0.12	111547 0096	111,-	111551 0096	111,-
9.7	10	103	61	0.12	111547 0097	111,-	111551 0097	111,-
9.8	10	103	61	0.12	111547 0098	111,-	111551 0098	111,-

1154

1154

1154

1154

Continued on next page >>>

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f stainless steel mm/rev	HA		HB	
					art.no.	€	art.no.	€
9.9	10	103	61	0.12	111547 0099	111,-	111551 0099	111,-
10	10	103	61	0.12	111547 0100	111,-	111551 0100	111,-
10.1	12	118	71	0.12	111547 0101	158,-		
10.2	12	118	71	0.12	111547 0102	158,-	111551 0102	158,-
10.3	12	118	71	0.12	111547 0103	158,-		
10.4	12	118	71	0.12	111547 0104	158,-		
10.5	12	118	71	0.12	111547 0105	158,-	111551 0105	158,-
10.6	12	118	71	0.12	111547 0106	158,-		
10.7	12	118	71	0.12	111547 0107	158,-		
10.8	12	118	71	0.12	111547 0108	158,-	111551 0108	158,-
10.9	12	118	71	0.12	111547 0109	158,-		
11	12	118	71	0.12	111547 0110	158,-	111551 0110	158,-
11.1	12	118	71	0.12	111547 0111	158,-		
11.2	12	118	71	0.12	111547 0112	158,-	111551 0112	158,-
11.3	12	118	71	0.12	111547 0113	158,-		
11.4	12	118	71	0.12	111547 0114	158,-		
11.5	12	118	71	0.12	111547 0115	158,-	111551 0115	158,-
11.6	12	118	71	0.12	111547 0116	158,-		
11.7	12	118	71	0.12	111547 0117	158,-		
11.8	12	118	71	0.12	111547 0118	158,-	111551 0118	158,-
11.9	12	118	71	0.12	111547 0119	158,-		
12	12	118	71	0.12	111547 0120	158,-	111551 0120	158,-
					1154		1154	

D m7 mm	D1 h6 mm	L mm	L1 mm	Feed f stainless steel mm/rev	HA		HB	
					art.no.	€	art.no.	€
12.2	14	124	77	0.12	111547 0122	203,-	111551 0122	203,-
12.5	14	124	77	0.12	111547 0125	203,-	111551 0125	203,-
12.7	14	124	77	0.12	111547 0127	203,-	111551 0127	203,-
13	14	124	77	0.12	111547 0130	203,-	111551 0130	203,-
13.5	14	124	77	0.12	111547 0135	203,-	111551 0135	203,-
14	14	124	77	0.12	111547 0140	203,-	111551 0140	203,-
14.2	16	133	83	0.12	111547 0142	233,-	111551 0142	233,-
14.5	16	133	83	0.12	111547 0145	233,-	111551 0145	233,-
15	16	133	83	0.12	111547 0150	233,-	111551 0150	233,-
15.5	16	133	83	0.12	111547 0155	233,-	111551 0155	233,-
16	16	133	83	0.12	111547 0160	233,-	111551 0160	233,-
16.5	18	143	93	0.12	111547 0165	390,-	111551 0165	390,-
16.9	18	143	93	0.12	111547 0169	390,-	111551 0169	390,-
17	18	143	93	0.12	111547 0170	390,-	111551 0170	390,-
17.5	18	143	93	0.14	111547 0175	390,-	111551 0175	390,-
18	18	143	93	0.14	111547 0180	390,-	111551 0180	390,-
18.5	20	153	101	0.14	111547 0185	430,-	111551 0185	430,-
18.9	20	153	101	0.14	111547 0189	430,-	111551 0189	430,-
19	20	153	101	0.14	111547 0190	430,-	111551 0190	430,-
19.5	20	153	101	0.16	111547 0195	430,-	111551 0195	430,-
20	20	153	101	0.16	111547 0200	430,-	111551 0200	430,-
					1154		1154	

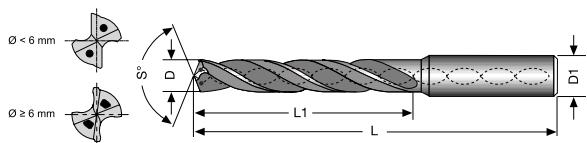
### ADO-SUS-5D solid carbide high-performance drill

VHM Werks-norm Typ VA 140° 30° 5xD DIN 6535 HA TiAlN Vc/fz 382

- **Cutting material: solid carbide, EgiAs coating**
- Sharp cutting edges reduce machining-induced material hardenings
- **Short and compact chips thanks to innovative chip flute geometry**
- Friction-reducing protective chamfer reduces heat development
- **New coolant bore design increases coolant flow rate and thus reduces heat generation in the material**
- Increased coating adhesion of the new EgiAs coating reduces premature wear and coating spalling

material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium	copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc		
	80-120	80-120	60-90	60-100	60-100	30-60	60-100	80-120	20-50			140	120	70					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
2.78	3	78	26	0.06	111615 0278	66,-
2.8	3	78	26	0.06	111615 0280	66,-
2.83	3	78	26	0.06	111615 0283	66,-
2.87	3	78	26	0.06	111615 0287	66,-
2.9	3	78	27	0.06	111615 0290	66,-
3	3	78	27	0.06	111615 0300	66,-
3.1	4	86	28	0.08	111615 0310	68,50
3.2	4	86	29	0.08	111615 0320	68,50
3.3	4	86	30	0.08	111615 0330	68,50
3.4	4	86	31	0.08	111615 0340	68,50
3.5	4	86	32	0.08	111615 0350	68,50
3.6	4	86	33	0.08	111615 0360	69,-

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
3.68	4	86	34	0.08	111615 0368	69,-
3.7	4	86	34	0.08	111615 0370	69,-
3.73	4	86	34	0.08	111615 0373	69,-
3.8	4	86	35	0.08	111615 0380	69,-
3.9	4	86	36	0.08	111615 0390	69,-
4	4	86	36	0.08	111615 0400	69,-
4.1	6	95	37	0.10	111615 0410	70,50
4.2	6	95	38	0.10	111615 0420	70,50
4.3	6	95	39	0.10	111615 0430	70,50
4.4	6	95	40	0.10	111615 0440	70,50
4.45	6	95	41	0.10	111615 0445	70,50
4.5	6	95	41	0.10	111615 0450	70,50

1107

1107

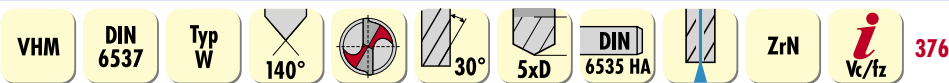
D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
4.6	6	95	42	0.10	111615 0460	72,50
4.64	6	95	42	0.10	111615 0464	72,50
4.7	6	95	43	0.10	111615 0470	72,50
4.8	6	95	44	0.10	111615 0480	72,50
4.9	6	95	45	0.10	111615 0490	72,50
5	6	95	45	0.10	111615 0500	72,50
5.1	6	100	41	0.12	111615 0510	76,50
5.2	6	100	42	0.12	111615 0520	76,50
5.3	6	100	43	0.12	111615 0530	76,50
5.4	6	100	44	0.12	111615 0540	76,50
5.5	6	100	44	0.12	111615 0550	76,50
5.54	6	100	45	0.12	111615 0554	76,50
5.6	6	100	45	0.12	111615 0560	80,50
5.7	6	100	46	0.12	111615 0570	80,50
5.8	6	100	47	0.12	111615 0580	80,50
5.9	6	100	48	0.12	111615 0590	80,50
6	6	100	48	0.12	111615 0600	80,50
6.1	8	109	49	0.14	111615 0610	90,-
6.2	8	109	50	0.14	111615 0620	90,-
6.3	8	109	51	0.14	111615 0630	90,-
6.4	8	109	52	0.14	111615 0640	90,-
6.5	8	109	52	0.14	111615 0650	90,-
6.6	8	109	53	0.14	111615 0660	90,-
6.7	8	109	54	0.14	111615 0670	90,-
6.8	8	109	55	0.14	111615 0680	90,-
6.9	8	109	56	0.14	111615 0690	90,-
7	8	109	56	0.14	111615 0700	90,-
7.1	8	118	57	0.16	111615 0710	90,-
7.2	8	118	58	0.16	111615 0720	90,-
7.3	8	118	59	0.16	111615 0730	90,-
7.38	8	118	60	0.16	111615 0738	90,-
7.4	8	118	60	0.16	111615 0740	90,-
7.45	8	118	60	0.16	111615 0745	90,-
7.5	8	118	60	0.16	111615 0750	90,-
7.54	8	118	61	0.16	111615 0754	90,-
7.6	8	118	61	0.16	111615 0760	95,-
7.7	8	118	62	0.16	111615 0770	95,-
7.8	8	118	63	0.16	111615 0780	95,-
7.9	8	118	64	0.16	111615 0790	95,-
8	8	118	64	0.16	111615 0800	95,-
8.1	10	128	65	0.18	111615 0810	110,-
8.2	10	128	66	0.18	111615 0820	110,-
8.3	10	128	67	0.18	111615 0830	110,-
8.4	10	128	68	0.18	111615 0840	110,-
8.5	10	128	68	0.18	111615 0850	110,-
8.6	10	128	69	0.18	111615 0860	110,-
8.7	10	128	70	0.18	111615 0870	110,-
8.8	10	128	71	0.18	111615 0880	110,-
8.9	10	128	72	0.18	111615 0890	110,-
9	10	128	72	0.18	111615 0900	110,-
9.1	10	136	73	0.20	111615 0910	110,-
9.2	10	136	74	0.20	111615 0920	110,-
9.26	10	136	75	0.20	111615 0926	110,-
9.3	10	136	75	0.20	111615 0930	110,-
9.38	10	136	76	0.20	111615 0938	110,-
9.4	10	136	76	0.20	111615 0940	110,-
9.5	10	136	76	0.20	111615 0950	110,-
9.54	10	136	77	0.20	111615 0954	110,-
9.6	10	136	77	0.20	111615 0960	112,-

1107

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
9.7	10	136	78	0.20	111615 0970	112,-
9.8	10	136	79	0.20	111615 0980	112,-
9.9	10	136	80	0.20	111615 0990	112,-
10	10	136	80	0.20	111615 1000	112,-
10.1	12	146	81	0.22	111615 1010	128,-
10.2	12	146	82	0.22	111615 1020	128,-
10.3	12	146	83	0.22	111615 1030	128,-
10.4	12	146	84	0.22	111615 1040	128,-
10.5	12	146	84	0.22	111615 1050	128,-
10.6	12	146	85	0.22	111615 1060	128,-
10.7	12	146	86	0.22	111615 1070	128,-
10.8	12	146	87	0.22	111615 1080	128,-
10.9	12	146	88	0.22	111615 1090	128,-
11	12	146	88	0.22	111615 1100	128,-
11.1	12	156	89	0.24	111615 1110	128,-
11.2	12	156	90	0.24	111615 1120	128,-
11.24	12	156	90	0.24	111615 1124	128,-
11.3	12	156	91	0.24	111615 1130	128,-
11.38	12	156	92	0.24	111615 1138	128,-
11.4	12	156	92	0.24	111615 1140	128,-
11.5	12	156	92	0.24	111615 1150	128,-
11.6	12	156	93	0.24	111615 1160	134,-
11.7	12	156	94	0.24	111615 1170	134,-
11.8	12	156	95	0.24	111615 1180	134,-
11.9	12	156	96	0.24	111615 1190	134,-
12	12	156	96	0.24	111615 1200	134,-
12.1	14	167	97	0.26	111615 1210	147,-
12.5	14	167	100	0.26	111615 1250	147,-
12.8	14	167	103	0.26	111615 1280	147,-
13	14	167	104	0.26	111615 1300	147,-
13.1	14	176	105	0.28	111615 1310	147,-
13.2	14	176	106	0.28	111615 1320	147,-
13.25	14	176	106	0.28	111615 1325	147,-
13.43	14	176	108	0.28	111615 1343	147,-
13.5	14	176	108	0.28	111615 1350	147,-
13.55	14	176	109	0.28	111615 1355	151,-
13.6	14	176	109	0.28	111615 1360	151,-
14	14	176	112	0.28	111615 1400	151,-
14.5	16	185	116	0.28	111615 1450	166,-
15	16	185	120	0.28	111615 1500	166,-
15.1	16	193	121	0.28	111615 1510	166,-
15.25	16	193	122	0.28	111615 1525	166,-
15.5	16	193	124	0.28	111615 1550	166,-
15.55	16	193	125	0.28	111615 1555	173,-
16	16	193	128	0.30	111615 1600	173,-
16.5	18	184	113	0.30	111615 1650	228,-
16.7	18	184	117	0.30	111615 1670	228,-
17	18	184	114	0.30	111615 1700	228,-
17.3	18	191	122	0.30	111615 1730	228,-
17.5	18	191	123	0.30	111615 1750	228,-
17.55	18	191	123	0.30	111615 1755	248,-
18	18	191	126	0.32	111615 1800	248,-
18.5	20	198	130	0.32	111615 1850	284,-
18.7	20	198	131	0.32	111615 1870	284,-
19	20	198	133	0.32	111615 1900	284,-
19.3	20	205	136	0.32	111615 1930	284,-
19.5	20	205	137	0.32	111615 1950	284,-
19.55	20	205	137	0.32	111615 1955	294,-
20	20	205	140	0.34	111615 2000	294,-

1107

# SARA® Solid carbide high-performance drill bit ALU 5D

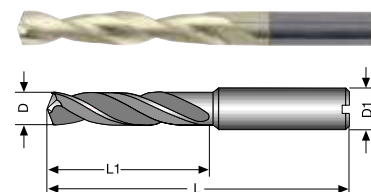


**Aluminium**

- Twisted coolant bore
- **Cutting material: solid carbide, ZrN-coated**
- Special rounded-off cutting edges to minimise micro-nicks

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	35-50	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	150		< 55 HRc	< 60 HRc	≥ 60 HRc
						60				○	○	○	●	●	●				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D m7 mm	D1 h6 mm	L1 mm	L mm	Feed f aluminium < 8 % Si mm/rev	art.no.	€
3.0	6	28	66	0.14	111410 0030	79,40
3.1	6	28	66	0.14	111410 0031	79,40
3.2	6	28	66	0.14	111410 0032	79,40
3.3	6	28	66	0.14	111410 0033	79,40
3.4	6	28	66	0.14	111410 0034	79,40
3.5	6	28	66	0.14	111410 0035	79,40
3.6	6	28	66	0.14	111410 0036	79,40
3.7	6	28	66	0.14	111410 0037	79,40
3.8	6	36	74	0.14	111410 0038	84,50
3.9	6	36	74	0.14	111410 0039	84,50
4.0	6	36	74	0.14	111410 0040	84,50
4.1	6	36	74	0.14	111410 0041	84,50
4.2	6	36	74	0.14	111410 0042	84,50
4.3	6	36	74	0.14	111410 0043	84,50
4.4	6	36	74	0.14	111410 0044	84,50
4.5	6	36	74	0.14	111410 0045	84,50
4.6	6	36	74	0.14	111410 0046	84,50
4.7	6	36	74	0.14	111410 0047	84,50
4.8	6	44	82	0.14	111410 0048	90,10
4.9	6	44	82	0.14	111410 0049	90,10
5.0	6	44	82	0.14	111410 0050	90,10
5.1	6	44	82	0.18	111410 0051	90,10
5.2	6	44	82	0.18	111410 0052	90,10
5.3	6	44	82	0.18	111410 0053	90,10
5.4	6	44	82	0.18	111410 0054	90,10
5.5	6	44	82	0.18	111410 0055	90,10
5.6	6	44	82	0.18	111410 0056	90,10
5.7	6	44	82	0.18	111410 0057	90,10
5.8	6	44	82	0.18	111410 0058	90,10
5.9	6	44	82	0.18	111410 0059	90,10
6.0	6	44	82	0.18	111410 0060	90,10
6.1	8	53	91	0.18	111410 0061	118,-
6.2	8	53	91	0.18	111410 0062	118,-
6.3	8	53	91	0.18	111410 0063	118,-
6.4	8	53	91	0.18	111410 0064	118,-
6.5	8	53	91	0.18	111410 0065	118,-
6.6	8	53	91	0.18	111410 0066	118,-
6.7	8	53	91	0.18	111410 0067	118,-
6.8	8	53	91	0.18	111410 0068	118,-
6.9	8	53	91	0.18	111410 0069	118,-
7.0	8	53	91	0.18	111410 0070	118,-
7.1	8	53	91	0.18	111410 0071	118,-

1148

D m7 mm	D1 h6 mm	L1 mm	L mm	Feed f aluminium < 8 % Si mm/rev	art.no.	€
7.2	8	53	91	0.18	111410 0072	118,-
7.3	8	53	91	0.18	111410 0073	118,-
7.4	8	53	91	0.18	111410 0074	118,-
7.5	8	53	91	0.18	111410 0075	118,-
7.6	8	53	91	0.18	111410 0076	118,-
7.7	8	53	91	0.18	111410 0077	118,-
7.8	8	53	91	0.18	111410 0078	118,-
7.9	8	53	91	0.18	111410 0079	118,-
8.0	8	53	91	0.18	111410 0080	118,-
8.1	10	61	103	0.26	111410 0081	151,-
8.2	10	61	103	0.26	111410 0082	151,-
8.3	10	61	103	0.26	111410 0083	151,-
8.4	10	61	103	0.26	111410 0084	151,-
8.5	10	61	103	0.26	111410 0085	151,-
8.6	10	61	103	0.26	111410 0086	151,-
8.7	10	61	103	0.26	111410 0087	151,-
8.8	10	61	103	0.26	111410 0088	151,-
8.9	10	61	103	0.26	111410 0089	151,-
9.0	10	61	103	0.26	111410 0090	151,-
9.1	10	61	103	0.26	111410 0091	151,-
9.2	10	61	103	0.26	111410 0092	151,-
9.3	10	61	103	0.26	111410 0093	151,-
9.4	10	61	103	0.26	111410 0094	151,-
9.5	10	61	103	0.26	111410 0095	151,-
9.6	10	61	103	0.26	111410 0096	151,-
9.7	10	61	103	0.26	111410 0097	151,-
9.8	10	61	103	0.26	111410 0098	151,-
9.9	10	61	103	0.26	111410 0099	151,-
10.0	10	61	103	0.26	111410 0100	151,-
10.1	12	71	118	0.26	111410 0101	187,-
10.2	12	71	118	0.26	111410 0102	187,-
10.3	12	71	118	0.26	111410 0103	187,-
10.4	12	71	118	0.26	111410 0104	187,-
10.5	12	71	118	0.26	111410 0105	187,-
10.6	12	71	118	0.26	111410 0106	187,-
10.7	12	71	118	0.26	111410 0107	187,-
10.8	12	71	118	0.26	111410 0108	187,-
10.9	12	71	118	0.26	111410 0109	187,-
11.0	12	71	118	0.26	111410 0110	187,-
11.1	12	71	118	0.26	111410 0111	187,-
11.2	12	71	118	0.26	111410 0112	187,-
11.3	12	71	118	0.26	111410 0113	187,-

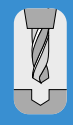
1148

D m7 mm	D1 h6 mm	L1 mm	L mm	Feed f aluminium < 8 % Si mm/rev	art.no.	€
11.4	12	71	118	0.26	111410 0114	187,-
11.5	12	71	118	0.26	111410 0115	187,-
11.6	12	71	118	0.26	111410 0116	187,-
11.7	12	71	118	0.26	111410 0117	187,-
11.8	12	71	118	0.26	111410 0118	187,-
11.9	12	71	118	0.26	111410 0119	187,-
12.0	12	71	118	0.26	111410 0120	187,-
12.3	14	77	124	0.36	111410 0123	239,-
12.5	14	77	124	0.36	111410 0125	239,-
12.8	14	77	124	0.36	111410 0128	239,-
13.0	14	77	124	0.36	111410 0130	239,-
13.5	14	77	124	0.36	111410 0135	239,-
13.8	14	77	124	0.36	111410 0138	239,-
14.0	14	77	124	0.36	111410 0140	239,-
14.5	16	83	133	0.36	111410 0145	321,-

1148

D m7 mm	D1 h6 mm	L1 mm	L mm	Feed f aluminium < 8 % Si mm/rev	art.no.	€
14.8	16	83	133	0.36	111410 0148	321,-
15.0	16	83	133	0.36	111410 0150	321,-
15.5	16	83	133	0.36	111410 0155	321,-
15.8	16	83	133	0.36	111410 0158	321,-
16.0	16	83	133	0.36	111410 0160	321,-
16.5	18	93	143	0.45	111410 0165	425,-
16.8	18	93	143	0.45	111410 0168	425,-
17.0	18	93	143	0.45	111410 0170	425,-
17.5	18	93	143	0.45	111410 0175	425,-
17.8	18	93	143	0.45	111410 0178	425,-
18.0	18	93	143	0.45	111410 0180	425,-
18.5	20	101	153	0.45	111410 0185	485,-
19.0	20	101	153	0.45	111410 0190	485,-
19.5	20	101	153	0.45	111410 0195	485,-
20.0	20	101	153	0.45	111410 0200	485,-

1148



## Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com



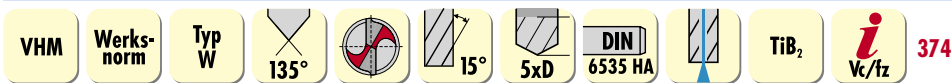
Effective clamping ...

... for automation.

**ATORN**<sup>®</sup>  
Performance demands quality



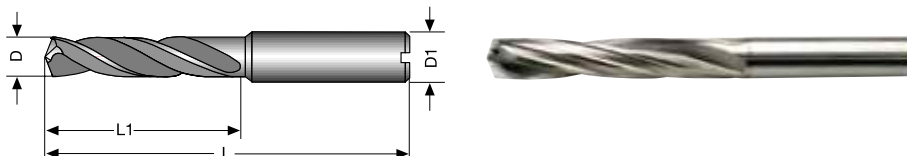
# ATORN® Solid carbide high-performance drill bit AluSpeed 5D



- Twisted cooling channel
- **6-fold guide chamfers, guarantees very high alignment precision and stabilisation of the drill bit**
- **Cutting material: ultra-superfine grain solid carbide K40F, Alu-CC-coated**
- Defined cutting-edge rounding to minimise micro-nicks on the tool cutting edge
- Coolant pressure min. 12 bar

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GR7/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc		
												●	●	●					
												360-400	350-360	160-200					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f aluminium < 8 % Si mm/rev	art.no.	€
2.5	4	57	21	0.15	111400 0250	73,80
2.8	4	57	21	0.15	111400 0280	73,80
3	6	66	28	0.15	111400 0300	73,80
3.25	6	66	28	0.15	111400 0325	73,80
3.3	6	66	28	0.20	111400 0330	73,80
3.5	6	66	28	0.20	111400 0350	73,80
3.8	6	74	36	0.20	111400 0380	73,80
4	6	74	36	0.20	111400 0400	73,80
4.2	6	74	36	0.25	111400 0420	73,80
4.5	6	74	36	0.25	111400 0450	73,80
4.6	6	74	36	0.25	111400 0460	73,80
4.65	6	74	36	0.25	111400 0465	73,80
4.8	6	82	44	0.30	111400 0480	73,80
5	6	82	44	0.30	111400 0500	73,80
5.5	6	82	44	0.35	111400 0550	73,80
5.8	6	82	44	0.35	111400 0580	73,80
6	6	82	44	0.35	111400 0600	73,80
6.5	8	91	53	0.40	111400 0650	78,90
6.8	8	91	53	0.40	111400 0680	78,90
7	8	91	53	0.40	111400 0700	78,90
7.4	8	91	53	0.45	111400 0740	78,90
7.45	8	91	53	0.45	111400 0745	78,90

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f aluminium < 8 % Si mm/rev	art.no.	€
7.8	8	91	53	0.45	111400 0780	78,90
8.0	8	91	53	0.45	111400 0800	78,90
8.5	10	103	61	0.45	111400 0850	95,10
8.8	10	103	61	0.45	111400 0880	95,10
9	10	103	61	0.50	111400 0900	95,10
9.35	10	103	61	0.50	111400 0935	95,10
9.8	10	103	61	0.50	111400 0980	95,10
10	10	103	61	0.50	111400 1000	95,10
10.2	12	118	71	0.55	111400 1020	132,50
11	12	118	71	0.55	111400 1100	132,50
11.2	12	118	71	0.55	111400 1120	132,50
12	12	118	71	0.55	111400 1200	132,50
13	14	124	77	0.55	111400 1300	180,50
14	14	124	77	0.60	111400 1400	180,50
15	16	133	83	0.60	111400 1500	232,-
15.5	16	133	83	0.60	111400 1550	232,-
16	16	133	83	0.60	111400 1600	232,-
17	18	143	93	0.60	111400 1700	305,-
17.5	18	143	93	0.60	111400 1750	305,-
18	18	143	93	0.65	111400 1800	305,-
20	20	143	101	0.70	111400 2000	385,-

1178

1178



Grooving from 2 mm ...

... with internal cooling.

**ATORN®**  
Performance demands quality

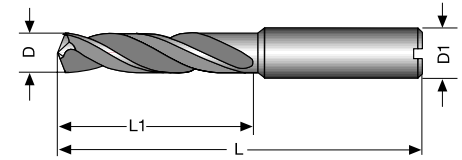
**ATORN® Solid carbide high-performance drill bit HARD 5D**

**NEW**

VHM Werks-norm Typ H 140° 20° 5xD DIN 6535 HA TiAlSiN i Vc/fz 374

- for machining drill holes up to 65 HRC
- **Cutting material: SC, TiAlSiN coating**
- reinforced core and special point thinning with sharp chisel edge
- no internal coolant supply for increased stability
- **also available in 3xD**
- **Note:** Do not hard drill dry!

**Up to 65 HRC**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				30-40					60-70								15-20	10-16	8-13

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Without internal cooling**

D mm	D1 h6 mm	L mm	L1 mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
2	4	57	21	0.04	111536 0020	59,80
2.5	4	57	21	0.04	111536 0025	59,80
2.6	4	57	21	0.04	111536 0026	59,80
2.8	4	57	21	0.04	111536 0028	59,80
3	6	66	28	0.04	111536 0030	59,80
3.3	6	66	28	0.06	111536 0033	59,80
3.4	6	66	28	0.06	111536 0034	59,80
3.5	6	66	28	0.06	111536 0035	59,80
3.7	6	66	28	0.06	111536 0037	59,80
3.8	6	74	36	0.06	111536 0038	59,80
3.9	6	74	36	0.06	111536 0039	59,80
4	6	74	36	0.06	111536 0040	59,80
4.2	6	74	36	0.06	111536 0042	59,80
4.3	6	74	36	0.06	111536 0043	59,80
4.5	6	74	36	0.06	111536 0045	59,80
4.8	6	82	44	0.06	111536 0048	59,80
4.9	6	82	44	0.06	111536 0049	59,80
5	6	82	44	0.06	111536 0050	59,80
5.1	6	82	44	0.07	111536 0051	59,80
5.2	6	82	44	0.07	111536 0052	59,80
5.5	6	82	44	0.07	111536 0055	59,80
5.8	6	82	44	0.07	111536 0058	59,80
5.9	6	82	44	0.07	111536 0059	59,80
6	6	82	44	0.07	111536 0060	59,80
6.5	8	91	53	0.07	111536 0065	66,20
6.8	8	91	53	0.07	111536 0068	66,20
7	8	91	53	0.07	111536 0070	66,20

1154



D mm	D1 h6 mm	L mm	L1 mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
7.2	8	91	53	0.07	111536 0072	66,20
7.8	8	91	53	0.07	111536 0078	66,20
7.9	8	91	53	0.07	111536 0079	66,20
8	8	91	53	0.07	111536 0080	66,20
8.5	10	103	61	0.08	111536 0085	74,80
8.7	10	103	61	0.08	111536 0087	74,80
8.8	10	103	61	0.08	111536 0088	74,80
9	10	103	61	0.08	111536 0090	74,80
9.8	10	103	61	0.08	111536 0098	74,80
9.9	10	103	61	0.08	111536 0099	74,80
10	10	103	61	0.08	111536 0100	74,80
10.2	12	118	71	0.08	111536 0102	108,50
10.3	12	118	71	0.08	111536 0103	108,50
10.5	12	118	71	0.08	111536 0105	108,50
11	12	118	71	0.08	111536 0110	108,50
11.8	12	118	71	0.08	111536 0118	108,50
11.9	12	118	71	0.08	111536 0119	108,50
12	12	118	71	0.08	111536 0120	108,50
12.5	14	124	77	0.1	111536 0125	143,-
13	14	124	77	0.1	111536 0130	143,-
14	14	124	77	0.1	111536 0140	143,-
14.9	16	133	83	0.1	111536 0149	183,-
15	16	133	83	0.1	111536 0150	183,-
15.9	16	133	83	0.1	111536 0159	183,-
16	16	133	83	0.1	111536 0160	183,-
17.5	18	143	93	0.11	111536 0175	333,-
18	18	143	93	0.11	111536 0180	333,-

1154

**With internal cooling**

D mm	D1 h6 mm	L mm	L1 mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
1	4	55	8	0.04	111537 0010	77,30
1.1	4	55	12	0.04	111537 0011	77,30
1.2	4	55	12	0.04	111537 0012	77,30

1154



D mm	D1 h6 mm	L mm	L1 mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
1.3	4	55	12	0.04	111537 0013	77,30
1.4	4	55	12	0.04	111537 0014	77,30
1.5	4	55	12	0.04	111537 0015	77,30

1154

Continued on next page >>>

D mm	D1 h6 mm	L mm	L1 mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
1.6	4	55	16	0.04	111537 0016	77,30
1.7	4	55	16	0.04	111537 0017	77,30
1.8	4	55	16	0.04	111537 0018	77,30
1.9	4	55	16	0.04	111537 0019	77,30
2	4	57	21	0.04	111537 0020	77,30
2.1	4	57	21	0.04	111537 0021	77,30
2.2	4	57	21	0.04	111537 0022	77,30
2.3	4	57	21	0.04	111537 0023	77,30
2.4	4	57	21	0.04	111537 0024	77,30
2.5	4	57	21	0.04	111537 0025	77,30
2.6	4	57	21	0.04	111537 0026	77,30
2.7	4	57	21	0.04	111537 0027	77,30
2.8	4	57	21	0.04	111537 0028	77,30
2.9	4	57	21	0.04	111537 0029	77,30
3	6	66	28	0.04	111537 0030	77,30
3.1	6	66	28	0.06	111537 0031	77,30
3.2	6	66	28	0.06	111537 0032	77,30
3.3	6	66	28	0.06	111537 0033	77,30
3.4	6	66	28	0.06	111537 0034	77,30
3.5	6	66	28	0.06	111537 0035	77,30
3.7	6	66	28	0.06	111537 0037	77,30
3.8	6	74	36	0.06	111537 0038	77,30
3.9	6	74	36	0.06	111537 0039	77,30
4	6	74	36	0.06	111537 0040	77,30
4.1	6	74	36	0.06	111537 0041	77,30
4.2	6	74	36	0.06	111537 0042	77,30
4.3	6	74	36	0.06	111537 0043	77,30
4.4	6	74	36	0.06	111537 0044	77,30
4.5	6	74	36	0.06	111537 0045	77,30
4.6	6	74	36	0.06	111537 0046	77,30
4.7	6	74	36	0.06	111537 0047	77,30
4.8	6	82	44	0.06	111537 0048	77,30
4.9	6	82	44	0.06	111537 0049	77,30
5	6	82	44	0.06	111537 0050	77,30
5.1	6	82	44	0.07	111537 0051	77,30
5.2	6	82	44	0.07	111537 0052	77,30
5.3	6	82	44	0.07	111537 0053	77,30
5.5	6	82	44	0.07	111537 0055	77,30
5.6	6	82	44	0.07	111537 0056	77,30
5.7	6	82	44	0.07	111537 0057	77,30
5.8	6	82	44	0.07	111537 0058	77,30
6	6	82	44	0.07	111537 0060	77,30
6.1	8	91	53	0.07	111537 0061	89,-
6.2	8	91	53	0.07	111537 0062	89,-
6.3	8	91	53	0.07	111537 0063	89,-
6.4	8	91	53	0.07	111537 0064	89,-
6.5	8	91	53	0.07	111537 0065	89,-

1154

D mm	D1 h6 mm	L mm	L1 mm	Feed f hardened steel ≥ 60 HRC mm/rev	art.no.	€
6.6	8	91	53	0.07	111537 0066	89,-
6.7	8	91	53	0.07	111537 0067	89,-
6.8	8	91	53	0.07	111537 0068	89,-
6.9	8	91	53	0.07	111537 0069	89,-
7	8	91	53	0.07	111537 0070	89,-
7.4	8	91	53	0.07	111537 0074	89,-
7.5	8	91	53	0.07	111537 0075	89,-
7.7	8	91	53	0.07	111537 0077	89,-
7.8	8	91	53	0.07	111537 0078	89,-
8	8	91	53	0.07	111537 0080	89,-
8.2	10	103	61	0.08	111537 0082	105,-
8.4	10	103	61	0.08	111537 0084	105,-
8.5	10	103	61	0.08	111537 0085	105,-
8.6	10	103	61	0.08	111537 0086	105,-
8.7	10	103	61	0.08	111537 0087	105,-
8.8	10	103	61	0.08	111537 0088	105,-
9	10	103	61	0.08	111537 0090	105,-
9.3	10	103	61	0.08	111537 0093	105,-
9.4	10	103	61	0.08	111537 0094	105,-
9.5	10	103	61	0.08	111537 0095	105,-
9.7	10	103	61	0.08	111537 0097	105,-
9.8	10	103	61	0.08	111537 0098	105,-
10	10	103	61	0.08	111537 0100	105,-
10.2	12	118	71	0.08	111537 0102	148,-
10.3	12	118	71	0.08	111537 0103	148,-
10.5	12	118	71	0.08	111537 0105	148,-
11	12	118	71	0.08	111537 0110	148,-
11.2	12	118	71	0.08	111537 0112	148,-
11.5	12	118	71	0.08	111537 0115	148,-
11.8	12	118	71	0.08	111537 0118	148,-
12	12	118	71	0.08	111537 0120	148,-
12.2	14	124	77	0.1	111537 0122	192,50
12.5	14	124	77	0.1	111537 0125	192,50
12.8	14	124	77	0.1	111537 0128	192,50
13	14	124	77	0.1	111537 0130	192,50
13.5	14	124	77	0.1	111537 0135	192,50
14	14	124	77	0.1	111537 0140	192,50
14.5	16	133	83	0.1	111537 0145	233,-
15	16	133	83	0.1	111537 0150	233,-
15.5	16	133	83	0.1	111537 0155	233,-
15.8	16	133	83	0.1	111537 0158	233,-
16	16	133	83	0.1	111537 0160	233,-
17	18	143	93	0.11	111537 0170	375,-
17.5	18	143	93	0.11	111537 0175	375,-
18	18	143	93	0.11	111537 0180	375,-
20	20	153	101	0.11	111537 0200	399,-

1154



Drilling and turning ...

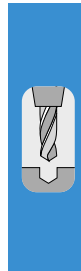
... with a single tool.

**ATORN®**  
Performance demands quality

# ATORN® TiAlNplus HPC 8D solid carbide high-performance drill bit with internal cooling

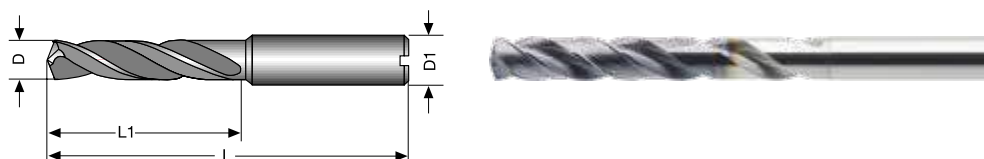


- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **Cutting material: Solid carbide ultra-fine grain TiAlNplus**
- Efficient drilling in different materials
- Newly developed geometry in conjunction with a customised multilayer coating for enhanced performance
- Special cutting edge finishing reduces micro-nicks and increases service life
- **Excellent alignment precision thanks to 4 guide chamfers**
- High process reliability, even at difficult-to-reach bore depths
- With internal cooling



material	● very well suited	steel			stainless steel		cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium	copper	graphite	hardened steel					
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	●	●	●	○	●	●	●	○	○	○	○	○	○	○	○
		120-145	65-120	65-105	45	55	160	120	40	35	35	260-310	220	125		55			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
3	6	72	34	0.08	111570 0300	171,-
3.1	6	72	34	0.08	111570 0310	171,-
3.2	6	72	34	0.08	111570 0320	171,-
3.3	6	72	34	0.08	111570 0330	171,-
3.4	6	72	34	0.09	111570 0340	171,-
3.5	6	72	34	0.09	111570 0350	171,-
3.6	6	72	34	0.09	111570 0360	171,-
3.7	6	72	34	0.09	111570 0370	171,-
3.8	6	81	43	0.10	111570 0380	171,-
3.9	6	81	43	0.10	111570 0390	171,-
4	6	81	43	0.10	111570 0400	171,-
4.1	6	81	43	0.10	111570 0410	171,-
4.2	6	81	43	0.11	111570 0420	171,-
4.3	6	81	43	0.11	111570 0430	171,-
4.4	6	81	43	0.11	111570 0440	171,-
4.5	6	81	43	0.11	111570 0450	171,-
4.6	6	81	43	0.12	111570 0460	171,-
4.7	6	81	43	0.12	111570 0470	171,-
4.8	6	95	57	0.12	111570 0480	171,-
4.9	6	95	57	0.12	111570 0490	171,-
5	6	95	57	0.13	111570 0500	171,-
5.1	6	95	57	0.13	111570 0510	171,-
5.2	6	95	57	0.13	111570 0520	171,-
5.3	6	95	57	0.13	111570 0530	171,-
5.4	6	95	57	0.14	111570 0540	171,-
5.5	6	95	57	0.14	111570 0550	171,-
5.6	6	95	57	0.14	111570 0560	171,-
5.7	6	95	57	0.14	111570 0570	171,-
5.8	6	95	57	0.15	111570 0580	171,-
5.9	6	95	57	0.15	111570 0590	171,-
6	6	95	57	0.15	111570 0600	171,-
6.1	8	114	76	0.15	111570 0610	212,-
6.2	8	114	76	0.16	111570 0620	212,-
6.3	8	114	76	0.16	111570 0630	212,-
6.4	8	114	76	0.16	111570 0640	212,-
6.5	8	114	76	0.16	111570 0650	212,-

1110

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
6.6	8	114	76	0.17	111570 0660	212,-
6.7	8	114	76	0.17	111570 0670	212,-
6.8	8	114	76	0.17	111570 0680	212,-
6.9	8	114	76	0.17	111570 0690	212,-
7	8	114	76	0.18	111570 0700	212,-
7.1	8	114	76	0.18	111570 0710	212,-
7.2	8	114	76	0.18	111570 0720	212,-
7.3	8	114	76	0.18	111570 0730	212,-
7.4	8	114	76	0.19	111570 0740	212,-
7.5	8	114	76	0.19	111570 0750	212,-
7.6	8	114	76	0.19	111570 0760	212,-
7.7	8	114	76	0.19	111570 0770	212,-
7.8	8	114	76	0.20	111570 0780	212,-
7.9	8	114	76	0.20	111570 0790	212,-
8	8	114	76	0.20	111570 0800	212,-
8.1	10	142	95	0.20	111570 0810	269,-
8.2	10	142	95	0.21	111570 0820	269,-
8.3	10	142	95	0.21	111570 0830	269,-
8.4	10	142	95	0.21	111570 0840	269,-
8.5	10	142	95	0.21	111570 0850	269,-
8.6	10	142	95	0.22	111570 0860	269,-
8.7	10	142	95	0.22	111570 0870	269,-
8.8	10	142	95	0.22	111570 0880	269,-
8.9	10	142	95	0.22	111570 0890	269,-
9	10	142	95	0.23	111570 0900	269,-
9.1	10	142	95	0.23	111570 0910	269,-
9.2	10	142	95	0.23	111570 0920	269,-
9.3	10	142	95	0.23	111570 0930	269,-
9.4	10	142	95	0.24	111570 0940	269,-
9.5	10	142	95	0.24	111570 0950	269,-
9.6	10	142	95	0.24	111570 0960	269,-
9.7	10	142	95	0.24	111570 0970	269,-
9.8	10	142	95	0.25	111570 0980	269,-
9.9	10	142	95	0.25	111570 0990	269,-
10	10	142	95	0.25	111570 1000	269,-
10.2	12	162	114	0.26	111570 1020	344,-

1110

Continued on next page >>>

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
10.5	12	162	114	0.26	111570 1050	344,-
10.8	12	162	114	0.27	111570 1080	344,-
11	12	162	114	0.28	111570 1100	344,-
11.5	12	162	114	0.29	111570 1150	344,-
11.8	12	162	114	0.30	111570 1180	344,-
12	12	162	114	0.30	111570 1200	344,-
12.2	14	178	131	0.31	111570 1220	430,-
12.5	14	178	131	0.31	111570 1250	430,-
13	14	178	131	0.33	111570 1300	430,-
13.5	14	178	131	0.34	111570 1350	430,-
14	14	178	131	0.35	111570 1400	430,-
14.5	16	203	152	0.36	111570 1450	589,-

1110

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
15	16	203	152	0.38	111570 1500	589,-
15.5	16	203	152	0.39	111570 1550	589,-
16	16	203	152	0.40	111570 1600	589,-
16.5	18	222	171	0.41	111570 1650	719,-
17	18	222	171	0.43	111570 1700	719,-
17.5	18	222	171	0.44	111570 1750	719,-
18	18	222	171	0.45	111570 1800	719,-
18.5	20	243	190	0.46	111570 1850	859,-
19	20	243	190	0.48	111570 1900	859,-
19.5	20	243	190	0.49	111570 1950	859,-
20	20	243	190	0.50	111570 2000	859,-

1110

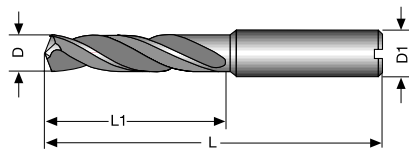
### ATORN® TiAlNplus HPC 12D solid carbide high-performance drill bit with internal cooling

VHM
Werk-norm
Typ TLP
140°
30°
12xD
DIN 6535 HA
TiAlN plus
i Vc/tz 377

- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **Cutting material: Solid carbide ultra-fine grain TiAlNplus**
- Efficient drilling in different materials
- Newly developed geometry in conjunction with a customised multilayer coating for enhanced performance
- Special cutting edge finishing reduces micro-nicks and increases service life
- **Excellent alignment precision thanks to 4 guide chamfers**
- High process reliability, even at difficult-to-reach bore depths
- With internal cooling

material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
			< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
			●	●	●	○	○		●	○				○	●	○		○			
			80-90	80	40-60	40	40		120	90				120	150	120		35			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	6	92	54	0.08	111572 0300	197,50
3.1	6	92	54	0.08	111572 0310	197,50
3.2	6	92	54	0.08	111572 0320	197,50
3.3	6	92	54	0.08	111572 0330	197,50
3.4	6	92	54	0.09	111572 0340	197,50
3.5	6	92	54	0.09	111572 0350	197,50
3.6	6	92	54	0.09	111572 0360	197,50
3.7	6	92	54	0.09	111572 0370	197,50
3.8	6	102	64	0.10	111572 0380	197,50
3.9	6	102	64	0.10	111572 0390	197,50
4	6	102	64	0.10	111572 0400	197,50
4.1	6	102	64	0.10	111572 0410	197,50
4.2	6	102	64	0.11	111572 0420	197,50
4.3	6	102	64	0.11	111572 0430	197,50
4.4	6	102	64	0.11	111572 0440	197,50
4.5	6	102	64	0.11	111572 0450	197,50
4.6	6	102	64	0.12	111572 0460	197,50
4.7	6	102	64	0.12	111572 0470	197,50
4.8	6	116	78	0.12	111572 0480	197,50
4.9	6	116	78	0.12	111572 0490	197,50

1110

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
5	6	116	78	0.13	111572 0500	197,50
5.1	6	116	78	0.13	111572 0510	197,50
5.2	6	116	78	0.13	111572 0520	197,50
5.3	6	116	78	0.13	111572 0530	197,50
5.4	6	116	78	0.14	111572 0540	197,50
5.5	6	116	78	0.14	111572 0550	197,50
5.6	6	116	78	0.14	111572 0560	197,50
5.7	6	116	78	0.14	111572 0570	197,50
5.8	6	116	78	0.15	111572 0580	197,50
5.9	6	116	78	0.15	111572 0590	197,50
6	6	116	78	0.15	111572 0600	197,50
6.1	8	146	108	0.15	111572 0610	273,-
6.2	8	146	108	0.16	111572 0620	273,-
6.3	8	146	108	0.16	111572 0630	273,-
6.4	8	146	108	0.16	111572 0640	273,-
6.5	8	146	108	0.16	111572 0650	273,-
6.6	8	146	108	0.17	111572 0660	273,-
6.7	8	146	108	0.17	111572 0670	273,-
6.8	8	146	108	0.17	111572 0680	273,-
6.9	8	146	108	0.17	111572 0690	273,-

1110

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
7	8	146	108	0.18	111572 0700	273,-
7.1	8	146	108	0.18	111572 0710	273,-
7.2	8	146	108	0.18	111572 0720	273,-
7.3	8	146	108	0.18	111572 0730	273,-
7.4	8	146	108	0.19	111572 0740	273,-
7.5	8	146	108	0.19	111572 0750	273,-
7.6	8	146	108	0.19	111572 0760	273,-
7.7	8	146	108	0.19	111572 0770	273,-
7.8	8	146	108	0.20	111572 0780	273,-
7.9	8	146	108	0.20	111572 0790	273,-
8	8	146	108	0.20	111572 0800	273,-
8.1	10	162	120	0.20	111572 0810	328,-
8.2	10	162	120	0.21	111572 0820	328,-
8.3	10	162	120	0.21	111572 0830	328,-
8.4	10	162	120	0.21	111572 0840	328,-
8.5	10	162	120	0.21	111572 0850	328,-
8.6	10	162	120	0.22	111572 0860	328,-
8.7	10	162	120	0.22	111572 0870	328,-
8.8	10	162	120	0.22	111572 0880	328,-
8.9	10	162	120	0.22	111572 0890	328,-
9	10	162	120	0.23	111572 0900	328,-
9.1	10	162	120	0.23	111572 0910	348,-
9.2	10	162	120	0.23	111572 0920	348,-
9.3	10	162	120	0.23	111572 0930	348,-
9.4	10	162	120	0.24	111572 0940	348,-
9.5	10	162	120	0.24	111572 0950	348,-
9.6	10	162	120	0.24	111572 0960	348,-
9.7	10	162	120	0.24	111572 0970	348,-
9.8	10	162	120	0.25	111572 0980	348,-
9.9	10	162	120	0.25	111572 0990	348,-

1110

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
10	10	162	120	0.25	111572 1000	348,-
10.2	12	204	156	0.26	111572 1020	445,-
10.5	12	204	156	0.26	111572 1050	445,-
10.8	12	204	156	0.27	111572 1080	445,-
11	12	204	156	0.28	111572 1100	445,-
11.5	12	204	156	0.29	111572 1150	445,-
11.8	12	204	156	0.30	111572 1180	445,-
12	12	204	156	0.30	111572 1200	445,-
12.5	14	230	182	0.31	111572 1250	569,-
12.7	14	230	182	0.32	111572 1270	569,-
12.8	14	230	182	0.32	111572 1280	569,-
13	14	230	182	0.33	111572 1300	569,-
13.5	14	230	182	0.34	111572 1350	569,-
13.8	14	230	182	0.35	111572 1380	569,-
14	14	230	182	0.35	111572 1400	569,-
14.5	16	260	208	0.36	111572 1450	759,-
14.8	16	260	208	0.37	111572 1480	759,-
15	16	260	208	0.38	111572 1500	759,-
15.5	16	260	208	0.39	111572 1550	759,-
15.8	16	260	208	0.40	111572 1580	759,-
16	16	260	208	0.40	111572 1600	759,-
16.5	18	285	234	0.41	111572 1650	839,-
17	18	285	234	0.43	111572 1700	839,-
17.5	18	285	234	0.44	111572 1750	839,-
18	18	285	234	0.45	111572 1800	839,-
18.5	20	310	258	0.46	111572 1850	1.019,-
19	20	310	258	0.48	111572 1900	1.019,-
19.5	20	310	258	0.49	111572 1950	1.019,-
20	20	310	258	0.50	111572 2000	1.019,-

1110

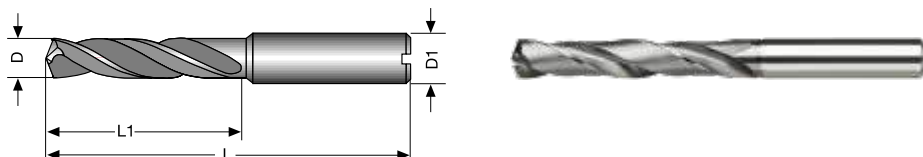
### ATORN® Solid carbide pilot drill bit TiAlNplus HPC



- For setting a pilot bore for deep-hole drill bits from 1.2xD
- **Cutting material: ultra-superfine grain solid carbide TiAlNplus**
- Precision-ground for extreme boring accuracy to meet high dimensional demands
- High guidance accuracy thanks to innovative geometry
- High-performance coating guarantees high cutting data and service life
- The tools are coordinated by geometry and diameter.

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc
		95	80	65	50	40		95	95	35	30	30	250	200	130			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2.02	4	57	21	0.08	111573 0202	49,40
2.22	4	57	21	0.08	111573 0222	49,40
2.32	4	57	21	0.08	111573 0232	49,40
2.42	4	57	21	0.08	111573 0242	49,40
2.52	4	57	21	0.08	111573 0252	49,40

1154

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2.62	4	57	21	0.08	111573 0262	49,40
2.72	4	57	21	0.08	111573 0272	49,40
2.82	4	57	21	0.08	111573 0282	49,40
2.92	4	57	21	0.08	111573 0292	49,40
3.02	6	66	28	0.08	111573 0302	67,20

1154

Continued on next page >>>



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3.22	6	66	28	0.08	111573 0322	67,20
3.32	6	66	28	0.08	111573 0332	67,20
3.52	6	66	28	0.08	111573 0352	67,20
3.82	6	74	36	0.15	111573 0382	67,20
4.02	6	74	36	0.15	111573 0402	67,20
4.22	6	74	36	0.15	111573 0422	67,20
4.52	6	74	36	0.15	111573 0452	67,20
4.82	6	82	44	0.15	111573 0482	67,20
5.02	6	82	44	0.15	111573 0502	67,20
5.52	6	82	44	0.15	111573 0552	67,20
5.82	6	82	44	0.25	111573 0582	67,20
6.02	6	82	44	0.25	111573 0602	67,20
6.52	8	91	53	0.25	111573 0652	89,-
6.82	8	91	53	0.25	111573 0682	89,-
7.02	8	91	53	0.25	111573 0702	89,-

1154

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
7.52	8	91	53	0.25	111573 0752	89,-
7.82	8	91	53	0.25	111573 0782	89,-
8.02	8	91	53	0.25	111573 0802	89,-
8.52	10	103	61	0.27	111573 0852	130,50
8.82	10	103	61	0.27	111573 0882	130,50
9.02	10	103	61	0.27	111573 0902	130,50
9.52	10	103	61	0.27	111573 0952	130,50
9.82	10	103	61	0.27	111573 0982	130,50
10.02	10	103	61	0.27	111573 1002	130,50
10.22	12	118	71	0.27	111573 1022	172,-
10.82	12	118	71	0.27	111573 1082	172,-
11.02	12	118	71	0.27	111573 1102	172,-
11.52	12	118	71	0.27	111573 1152	172,-
11.82	12	118	71	0.27	111573 1182	172,-
12.02	12	118	71	0.27	111573 1202	172,-

1154

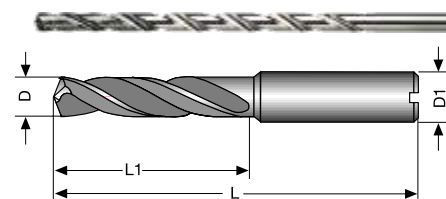
### ATORN® Solid carbide deep-hole drill bit TiAlNplus HPC 16D



- High-performance deep-hole drill bit with 4 guide chamfers
- **Cutting material: ultra-superfine grain solid carbide TiAlNplus**
- Excellent all-round properties and precise cutting behaviour with high cutting data
- Unique, extremely tough, smooth, temperature-resistant and close contour TiAlN coating
- Cutting-edge preparation minimises micro-nicks on the tool cutting edge
- Range is coordinated by angle and diameter

material	● very well suited	steel			stainless steel		cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		●	●	●	○	○		●	●									
		90	75	65	35	30		80	80									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



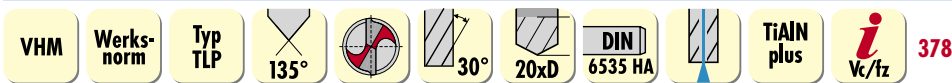
D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	6	100	60	0.08	111574 0300	213,-
3.2	6	100	60	0.08	111574 0320	213,-
3.3	6	100	60	0.08	111574 0330	213,-
3.5	6	100	60	0.08	111574 0350	213,-
3.8	6	115	75	0.08	111574 0380	221,-
4	6	115	75	0.08	111574 0400	221,-
4.2	6	115	75	0.08	111574 0420	238,-
4.5	6	130	90	0.08	111574 0450	238,-
4.8	6	130	90	0.08	111574 0480	252,-
5	6	130	90	0.08	111574 0500	252,-
5.5	6	150	108	0.12	111574 0550	266,-
5.8	6	150	108	0.12	111574 0580	266,-
6	6	150	108	0.12	111574 0600	266,-
6.5	8	165	125	0.12	111574 0650	282,-
6.8	8	165	125	0.12	111574 0680	304,-
7	8	165	125	0.12	111574 0700	304,-

1154

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
7.5	8	180	140	0.12	111574 0750	336,-
7.8	8	180	140	0.12	111574 0780	336,-
8	8	180	140	0.12	111574 0800	336,-
8.5	10	205	160	0.15	111574 0850	370,-
8.8	10	205	160	0.15	111574 0880	415,-
9	10	205	160	0.15	111574 0900	415,-
9.5	10	205	160	0.15	111574 0950	415,-
9.8	10	225	180	0.15	111574 0980	415,-
10	10	225	180	0.15	111574 1000	415,-
10.2	12	240	190	0.15	111574 1020	465,-
10.5	12	240	190	0.15	111574 1050	465,-
10.8	12	240	190	0.15	111574 1080	465,-
11	12	240	190	0.15	111574 1100	465,-
11.5	12	240	190	0.15	111574 1150	465,-
11.8	12	265	215	0.15	111574 1180	465,-
12	12	265	215	0.15	111574 1200	465,-

1154

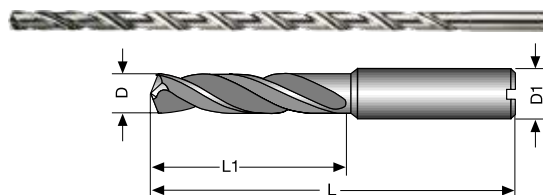
# ATORN® Solid carbide deep-hole drill bit TiAlNplus HPC 20D



- High-performance deep-hole drill bit with 4 guide chamfers
- **Cutting material: ultra-superfine grain solid carbide TiAlNplus**
- Excellent all-round properties and precise cutting behaviour with high cutting data
- Unique, extremely tough, smooth, temperature-resistant and close contour TiAlN coating
- Cutting-edge preparation minimises micro-nicks on the tool cutting edge
- Range is coordinated by angle and diameter

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○		●	●										
		90	75	65	35	30		80	80										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
2	6	92	50	0.05	111575 0200	158,50
2.2	6	92	50	0.05	111575 0220	158,50
2.3	6	92	50	0.05	111575 0230	158,50
2.4	6	112	70	0.05	111575 0240	176,50
2.5	6	112	70	0.05	111575 0250	176,50
2.7	6	112	70	0.05	111575 0270	176,50
2.8	6	112	70	0.05	111575 0280	176,50
2.9	6	112	70	0.05	111575 0290	176,50
3	6	120	80	0.08	111575 0300	242,-
3.2	6	120	80	0.08	111575 0320	242,-
3.3	6	120	80	0.08	111575 0330	242,-
3.5	6	120	80	0.08	111575 0350	242,-
3.8	6	130	90	0.08	111575 0380	250,-
4	6	130	90	0.08	111575 0400	250,-
4.2	6	160	110	0.08	111575 0420	271,-
4.5	6	160	110	0.08	111575 0450	271,-
4.6	6	160	120	0.08	111575 0460	271,-
4.8	6	160	120	0.08	111575 0480	286,-
5	6	160	120	0.08	111575 0500	286,-
5.5	6	185	140	0.12	111575 0550	297,-
5.8	6	185	140	0.12	111575 0580	297,-

1154

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
6	6	185	140	0.12	111575 0600	297,-
6.5	8	210	160	0.12	111575 0650	317,-
6.8	8	210	160	0.12	111575 0680	341,-
7	8	210	160	0.12	111575 0700	341,-
7.5	8	230	180	0.12	111575 0750	380,-
7.8	8	230	180	0.12	111575 0780	380,-
8	8	230	180	0.12	111575 0800	380,-
8.5	10	260	195	0.15	111575 0850	420,-
8.8	10	290	230	0.15	111575 0880	470,-
9	10	290	230	0.15	111575 0900	470,-
9.5	10	290	230	0.15	111575 0950	470,-
9.8	10	290	230	0.15	111575 0980	470,-
10	10	290	230	0.15	111575 1000	470,-
10.2	12	315	268	0.15	111575 1020	509,-
10.5	12	315	268	0.15	111575 1050	509,-
10.8	12	315	268	0.15	111575 1080	509,-
11	12	315	268	0.15	111575 1100	509,-
11.5	12	315	268	0.15	111575 1150	509,-
11.8	12	315	268	0.15	111575 1180	509,-
12	12	315	268	0.15	111575 1200	509,-

1154

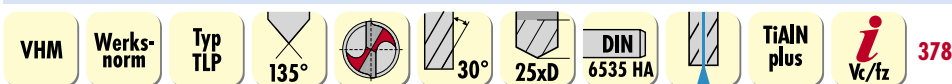
## THE COMPLETE MACHINING RANGE




**PALBIT**  
Machining tools  
411 pages  
Art.no. 019900 0315

Overview of all free manufacturers' catalogues on page 16/17

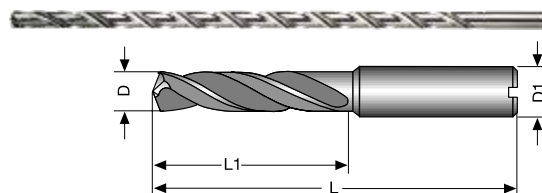
# ATORN® Solid carbide deep-hole drill bit TiAlNplus HPC 25D



- High-performance deep-hole drill bit with 4 guide chamfers
- **Cutting material: ultra-superfine grain solid carbide TiAlNplus**
- Excellent all-round properties and precise cutting behaviour with high cutting data
- Unique, extremely tough, smooth, temperature-resistant and close contour TiAlN coating
- Cutting-edge preparation minimises micro-nicks on the tool cutting edge
- Range is coordinated by angle and diameter

material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● very well suited ○ well suited	●	●	●	○	○		●	●										
	80	60	40	35	30		70	70										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	6	135	98	0.08	111576 0300	302,-
3.2	6	135	98	0.08	111576 0320	302,-
3.3	6	150	110	0.08	111576 0330	311,-
3.5	6	150	110	0.08	111576 0350	311,-
3.8	6	160	120	0.08	111576 0380	320,-
4	6	160	120	0.08	111576 0400	320,-
4.2	6	160	120	0.08	111576 0420	320,-
4.5	6	180	135	0.08	111576 0450	331,-
4.8	6	180	135	0.08	111576 0480	331,-
5	6	180	135	0.08	111576 0500	331,-
5.5	6	205	168	0.12	111576 0550	355,-
5.8	6	205	168	0.12	111576 0580	355,-
6	6	205	168	0.12	111576 0600	355,-
6.5	8	240	200	0.12	111576 0650	399,-
6.8	8	240	200	0.12	111576 0680	399,-
7	8	240	200	0.12	111576 0700	399,-

1154

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
7.5	8	260	220	0.12	111576 0750	445,-
7.8	8	260	220	0.12	111576 0780	445,-
8	8	260	220	0.12	111576 0800	445,-
8.5	10	285	240	0.15	111576 0850	499,-
8.8	10	310	268	0.15	111576 0880	539,-
9	10	310	268	0.15	111576 0900	539,-
9.5	10	310	268	0.15	111576 0950	539,-
9.8	10	310	268	0.15	111576 0980	539,-
10	10	310	268	0.15	111576 1000	539,-
10.2	12	375	325	0.15	111576 1020	639,-
10.5	12	375	325	0.15	111576 1050	639,-
10.8	12	375	325	0.15	111576 1080	639,-
11	12	375	325	0.15	111576 1100	639,-
11.5	12	375	325	0.15	111576 1150	639,-
11.8	12	375	325	0.15	111576 1180	639,-
12	12	375	325	0.15	111576 1200	639,-

1154

## Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com

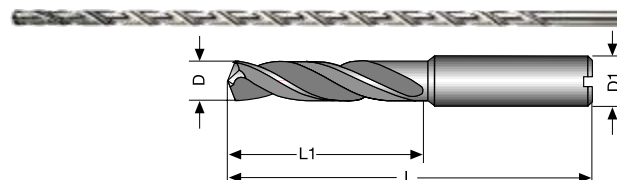
# ATORN® Solid carbide deep-hole drill bit TiAlNplus HPC 30D



- High-performance deep-hole drill bit with 4 guide chamfers
- **Cutting material: ultra-superfine grain solid carbide TiAlNplus**
- Excellent all-round properties and precise cutting behaviour with high cutting data
- Unique, extremely tough, smooth, temperature-resistant and close contour TiAlN coating
- Cutting-edge preparation minimises micro-nicks on the tool cutting edge
- Range is coordinated by angle and diameter

material	● very well suited	steel		stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8 % Si	≥8 % Si		<55 HRc	<60 HRc	≥60 HRc
		60	50	35	35	30		70	70								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
2	4	115	70	0.08	111577 0200	209,-
2.2	4	115	70	0.08	111577 0220	209,-
2.3	4	115	70	0.08	111577 0230	209,-
2.4	4	138	90	0.08	111577 0240	227,-
2.5	4	138	90	0.08	111577 0250	227,-
2.7	4	138	90	0.08	111577 0270	227,-
2.8	4	138	90	0.08	111577 0280	227,-
2.9	4	138	90	0.08	111577 0290	227,-
3	6	150	105	0.08	111577 0300	360,-
3.2	6	150	105	0.12	111577 0320	360,-
3.3	6	185	135	0.12	111577 0330	370,-
3.5	6	185	135	0.12	111577 0350	370,-
3.8	6	185	135	0.12	111577 0380	370,-
4	6	185	135	0.12	111577 0400	370,-
4.2	6	185	135	0.12	111577 0420	370,-
4.5	6	215	165	0.12	111577 0450	380,-
4.6	6	215	165	0.12	111577 0460	380,-
4.8	6	215	165	0.12	111577 0480	380,-
5	6	215	165	0.12	111577 0500	380,-
5.5	6	230	180	0.15	111577 0550	395,-
5.8	6	230	180	0.15	111577 0580	395,-

1154

D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
6	6	230	180	0.15	111577 0600	395,-
6.5	8	280	215	0.15	111577 0650	435,-
6.8	8	280	230	0.15	111577 0680	455,-
7	8	280	230	0.15	111577 0700	455,-
7.5	8	280	230	0.15	111577 0750	455,-
7.8	8	315	265	0.15	111577 0780	499,-
8	8	315	265	0.15	111577 0800	499,-
8.5	10	350	295	0.15	111577 0850	579,-
8.8	10	380	330	0.15	111577 0880	609,-
9	10	380	330	0.15	111577 0900	609,-
9.5	10	380	330	0.15	111577 0950	609,-
9.8	10	380	330	0.15	111577 0980	609,-
10	10	380	330	0.15	111577 1000	609,-
10.2	12	430	380	0.15	111577 1020	779,-
10.5	12	430	380	0.15	111577 1050	779,-
10.8	12	430	380	0.15	111577 1080	779,-
11	12	430	380	0.15	111577 1100	779,-
11.5	12	430	380	0.15	111577 1150	779,-
11.8	12	430	380	0.15	111577 1180	779,-
12	12	430	380	0.15	111577 1200	779,-

1154

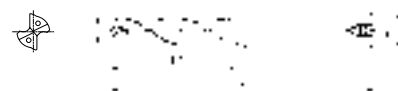
## Solid carbide pilot drill ADO-PLT

VHM Werks-norm Typ PLT 160° 30° DIN 6535 HA TiAlN i Vc/fz 379

- for positioning a pilot bore for deep-hole drills from 10xD
- with optimised shank diameter tolerance, suitable for use in shrink-fit holders
- **Cutting material: SC EgiAs-coated**
- Optimum chip removal with special cutting geometry and large chip spaces
- True-running accuracy of the tool when clamped: max. 0.02mm
- Cutting edge tolerance h8

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○		●	●										
		60-125	60-125	60-125	40-80	40-80		60-125	50-80										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3.03	3	65	15	0.06	111726 0303	90,70
3.53	4	70	18	0.07	111726 0353	95,80
4.03	4	70	20	0.08	111726 0403	102,40
4.53	5	75	23	0.09	111726 0453	109,20
5.03	5	75	25	0.10	111726 0503	115,80
5.53	6	80	28	0.11	111726 0553	122,10
6.03	6	80	30	0.12	111726 0603	122,10
6.53	7	85	33	0.13	111726 0653	129,40

1107

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
7.03	7	85	35	0.14	111726 0703	136,90
8.03	8	90	40	0.16	111726 0803	152,50
8.53	9	95	43	0.17	111726 0853	158,80
9.03	9	95	45	0.18	111726 0903	166,80
10.03	10	100	50	0.20	111726 1003	180,-
11.03	11	115	55	0.22	111726 1103	193,-
12.03	12	120	60	0.24	111726 1203	210,30

1107

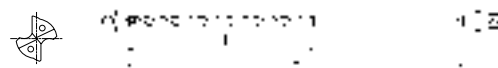
## Solid carbide deep-hole drill ADO-10D

VHM Werks-norm Typ TLP 140° 30° 10xD DIN 6535 HA TiAlN i Vc/fz 379

- With optimised shank diameter tolerance, suitable for use in shrink-fit holders
- **Cutting material: SC EgiAs-coated**
- High-performance drill for cost-efficient manufacturing of deep bores up to 10xD with no step
- Optimum chip removal with special cutting geometry and large chip spaces
- True-running accuracy of the tool when clamped: max. 0.02mm
- Cutting edge tolerance e8

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○		●	●										
		60-125	60-125	60-125	40-80	40-80		60-125	50-80										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2	3	75	26	0.04	111715 0020	128,40
2.1	3	75	33	0.04	111715 0021	128,40
2.2	3	75	33	0.04	111715 0022	128,40
2.3	3	75	33	0.05	111715 0023	128,40
2.4	3	75	33	0.05	111715 0024	128,40
2.5	3	75	33	0.05	111715 0025	128,40
2.6	3	90	40	0.05	111715 0026	128,40

1107

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2.7	3	90	40	0.05	111715 0027	128,40
2.8	3	90	40	0.06	111715 0028	128,40
2.9	3	90	40	0.06	111715 0029	128,40
3	3	90	40	0.06	111715 0030	107,70
3.1	4	100	45	0.06	111715 0031	109,90
3.2	4	100	45	0.06	111715 0032	109,90
3.3	4	100	45	0.07	111715 0033	109,90

1107

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3.4	4	100	50	0.07	111715 0034	109,90
3.5	4	100	50	0.07	111715 0035	109,90
3.6	4	100	50	0.07	111715 0036	109,90
3.7	4	100	50	0.07	111715 0037	109,90
3.8	4	100	50	0.08	111715 0038	109,90
3.9	4	100	50	0.08	111715 0039	109,90
4	4	100	50	0.08	111715 0040	109,90
4.1	6	115	55	0.08	111715 0041	124,-
4.2	6	115	55	0.08	111715 0042	124,-
4.3	6	115	60	0.09	111715 0043	124,-
4.4	6	115	60	0.09	111715 0044	124,-
4.5	6	115	60	0.09	111715 0045	124,-
4.6	6	115	60	0.09	111715 0046	124,-
4.7	6	115	65	0.09	111715 0047	124,-
4.8	6	115	65	0.1	111715 0048	124,-
4.9	6	115	65	0.1	111715 0049	124,-
5	6	115	65	0.1	111715 0050	124,-
5.1	6	128	70	0.1	111715 0051	124,-
5.2	6	128	70	0.1	111715 0052	124,-
5.3	6	128	70	0.11	111715 0053	124,-
5.4	6	128	78	0.11	111715 0054	124,-
5.5	6	128	78	0.11	111715 0055	124,-
5.6	6	128	78	0.11	111715 0056	124,-
5.7	6	128	78	0.11	111715 0057	124,-
5.8	6	128	78	0.12	111715 0058	124,-
5.9	6	128	78	0.12	111715 0059	124,-
6	6	128	78	0.12	111715 0060	124,-
6.1	8	140	87	0.12	111715 0061	150,-
6.2	8	140	87	0.12	111715 0062	150,-
6.3	8	140	87	0.13	111715 0063	150,-
6.4	8	140	87	0.13	111715 0064	150,-
6.5	8	140	87	0.13	111715 0065	150,-
6.6	8	140	87	0.13	111715 0066	150,-
6.7	8	140	87	0.13	111715 0067	150,-
6.8	8	140	90	0.14	111715 0068	150,-
6.9	8	140	90	0.14	111715 0069	150,-
7	8	140	90	0.14	111715 0070	150,-
7.1	8	155	100	0.14	111715 0071	150,-
7.2	8	155	100	0.14	111715 0072	150,-
7.3	8	155	100	0.15	111715 0073	150,-
7.4	8	155	100	0.15	111715 0074	150,-
7.5	8	155	100	0.15	111715 0075	150,-
7.6	8	155	105	0.15	111715 0076	150,-
7.7	8	155	105	0.15	111715 0077	150,-

1107

D h8 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
7.8	8	155	105	0.16	111715 0078	150,-
7.9	8	155	105	0.16	111715 0079	150,-
8	8	155	105	0.16	111715 0080	150,-
8.1	10	165	110	0.16	111715 0081	168,50
8.2	10	165	110	0.16	111715 0082	168,50
8.3	10	165	110	0.17	111715 0083	168,50
8.4	10	165	110	0.17	111715 0084	168,50
8.5	10	165	110	0.17	111715 0085	168,50
8.6	10	165	115	0.17	111715 0086	168,50
8.7	10	165	115	0.17	111715 0087	168,50
8.8	10	165	115	0.18	111715 0088	168,50
8.9	10	165	115	0.18	111715 0089	168,50
9	10	165	115	0.18	111715 0090	168,50
9.1	10	190	125	0.18	111715 0091	168,50
9.2	10	190	125	0.18	111715 0092	168,50
9.3	10	190	125	0.19	111715 0093	168,50
9.4	10	190	125	0.19	111715 0094	168,50
9.5	10	190	125	0.19	111715 0095	168,50
9.6	10	190	130	0.19	111715 0096	168,50
9.7	10	190	130	0.19	111715 0097	168,50
9.8	10	190	130	0.2	111715 0098	168,50
9.9	10	190	130	0.2	111715 0099	168,50
10	10	190	130	0.2	111715 0100	168,50
10.1	12	205	140	0.2	111715 0101	215,50
10.2	12	205	140	0.2	111715 0102	215,50
10.3	12	205	140	0.21	111715 0103	215,50
10.4	12	205	140	0.21	111715 0104	215,50
10.5	12	205	140	0.21	111715 0105	215,50
10.6	12	205	140	0.21	111715 0106	215,50
10.7	12	205	140	0.21	111715 0107	215,50
10.8	12	205	145	0.22	111715 0108	215,50
10.9	12	205	145	0.22	111715 0109	215,50
11	12	205	145	0.22	111715 0110	215,50
11.1	12	215	155	0.22	111715 0111	215,50
11.2	12	215	155	0.22	111715 0112	215,50
11.3	12	215	155	0.23	111715 0113	215,50
11.4	12	215	155	0.23	111715 0114	215,50
11.5	12	215	155	0.23	111715 0115	215,50
11.6	12	215	155	0.23	111715 0116	215,50
11.7	12	215	155	0.23	111715 0117	215,50
11.8	12	215	155	0.24	111715 0118	215,50
11.9	12	215	155	0.24	111715 0119	215,50
12	12	215	155	0.24	111715 0120	215,50

1107

# Machine tap

Page 231





# Solid carbide deep-hole drill ADO-15D

VHM
Werks-norm
Typ TLP
140°
30°
15xD
DIN 6535 HA
TiAlN
i Vc/tz
379

- With optimised shank diameter tolerance, suitable for use in shrink-fit holders
- **Cutting material: SC EgiAs-coated**
- High-performance drill for cost-efficient manufacturing of deep bores up to 15xD with no step
- Optimum chip removal with special cutting geometry and large chip spaces
- True running accuracy of the tool when clamped: max. 0.02mm
- Cutting edge tolerance e8

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Co-alloy	ERP/EPF/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		60-125	60-125	60-125	40-80	40-80		60-125	50-80										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
3	3	105	55	0.06	111716 0030	174,70
3.1	4	125	60	0.06	111716 0031	178,40
3.2	4	125	60	0.06	111716 0032	178,40
3.3	4	125	60	0.07	111716 0033	178,40
3.4	4	125	65	0.07	111716 0034	178,40
3.5	4	125	65	0.07	111716 0035	178,40
3.6	4	125	65	0.07	111716 0036	178,40
3.7	4	125	65	0.07	111716 0037	178,40
3.8	4	125	75	0.08	111716 0038	178,40
3.9	4	125	75	0.08	111716 0039	178,40
4	4	125	75	0.08	111716 0040	178,40
4.1	6	140	75	0.08	111716 0041	190,70
4.2	6	140	75	0.08	111716 0042	190,70
4.3	6	140	85	0.09	111716 0043	190,70
4.4	6	140	85	0.09	111716 0044	190,70
4.5	6	140	85	0.09	111716 0045	190,70
4.6	6	140	85	0.09	111716 0046	203,-
4.7	6	140	85	0.09	111716 0047	203,-
4.8	6	140	90	0.1	111716 0048	203,-
4.9	6	140	90	0.1	111716 0049	203,-
5	6	140	90	0.1	111716 0050	203,-
5.1	6	160	95	0.1	111716 0051	210,20
5.2	6	160	95	0.1	111716 0052	210,20
5.3	6	160	95	0.11	111716 0053	210,20
5.4	6	160	110	0.11	111716 0054	210,20
5.5	6	160	110	0.11	111716 0055	210,20
5.6	6	160	110	0.11	111716 0056	217,50
5.7	6	160	110	0.11	111716 0057	217,50
5.8	6	160	110	0.12	111716 0058	217,50
5.9	6	160	110	0.12	111716 0059	217,50
6	6	160	110	0.12	111716 0060	217,50
6.1	8	175	120	0.12	111716 0061	233,40
6.2	8	175	120	0.12	111716 0062	233,40
6.3	8	175	120	0.13	111716 0063	233,40
6.4	8	175	120	0.13	111716 0064	233,40
6.5	8	175	120	0.13	111716 0065	233,40
6.6	8	175	120	0.13	111716 0066	243,-
6.7	8	175	120	0.13	111716 0067	243,-

1107

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
6.8	8	175	125	0.14	111716 0068	243,-
6.9	8	175	125	0.14	111716 0069	243,-
7	8	175	125	0.14	111716 0070	243,-
7.1	8	195	135	0.14	111716 0071	257,80
7.2	8	195	135	0.14	111716 0072	257,80
7.3	8	195	135	0.15	111716 0073	257,80
7.4	8	195	135	0.15	111716 0074	257,80
7.5	8	195	135	0.15	111716 0075	257,80
7.6	8	195	145	0.15	111716 0076	272,40
7.7	8	195	145	0.15	111716 0077	272,40
7.8	8	195	145	0.16	111716 0078	272,40
7.9	8	195	145	0.16	111716 0079	272,40
8	8	195	145	0.16	111716 0080	272,40
8.1	10	210	155	0.16	111716 0081	300,40
8.2	10	210	155	0.16	111716 0082	300,40
8.3	10	210	155	0.17	111716 0083	300,40
8.4	10	210	155	0.17	111716 0084	300,40
8.5	10	210	155	0.17	111716 0085	300,40
8.6	10	210	160	0.17	111716 0086	303,50
8.7	10	210	160	0.17	111716 0087	303,50
8.8	10	210	160	0.18	111716 0088	303,50
8.9	10	210	160	0.18	111716 0089	303,50
9	10	210	160	0.18	111716 0090	303,50
9.1	10	240	170	0.18	111716 0091	334,60
9.2	10	240	170	0.18	111716 0092	334,60
9.3	10	240	170	0.19	111716 0093	334,60
9.4	10	240	170	0.19	111716 0094	334,60
9.5	10	240	170	0.19	111716 0095	334,60
9.6	10	240	180	0.19	111716 0096	334,60
9.7	10	240	180	0.19	111716 0097	334,60
9.8	10	240	180	0.2	111716 0098	334,60
9.9	10	240	180	0.2	111716 0099	334,60
10	10	240	180	0.2	111716 0100	334,60
10.1	12	260	190	0.2	111716 0101	368,10
10.2	12	260	190	0.2	111716 0102	368,10
10.3	12	260	190	0.21	111716 0103	368,10
10.4	12	260	190	0.21	111716 0104	368,10
10.5	12	260	190	0.21	111716 0105	368,10

1107

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
10.6	12	260	190	0.21	111716 0106	368,10
10.7	12	260	200	0.21	111716 0107	368,10
10.8	12	260	200	0.22	111716 0108	368,10
10.9	12	260	200	0.22	111716 0109	368,10
11	12	260	200	0.22	111716 0110	368,10
11.1	12	280	210	0.22	111716 0111	404,80
11.2	12	280	210	0.22	111716 0112	404,80
11.3	12	280	210	0.23	111716 0113	404,80

1107

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
11.4	12	280	210	0.23	111716 0114	404,80
11.5	12	280	210	0.23	111716 0115	404,80
11.6	12	280	210	0.23	111716 0116	404,80
11.7	12	280	210	0.23	111716 0117	404,80
11.8	12	280	210	0.24	111716 0118	404,80
11.9	12	280	215	0.24	111716 0119	404,80
12	12	280	215	0.24	111716 0120	404,80

1107

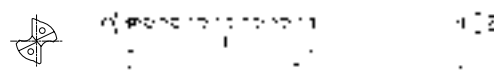
## GG Solid carbide deep-hole drill ADO-20D

379

- With optimised shank diameter tolerance, suitable for use in shrink-fit holders
- **Cutting material: SC EgiAs-coated**
- High-performance drill for cost-efficient manufacturing of deep bores up to 20xD with no step
- Optimum chip removal with special cutting geometry and large chip spaces
- True running accuracy of the tool when clamped: max. 0.02mm
- Cutting edge tolerance e8

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○		●	●										
		60-125	60-125	60-125	40-80	40-80		60-125	50-80										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	3	120	70	0.06	111717 0030	192,10
3.1	4	140	80	0.06	111717 0031	196,80
3.2	4	140	80	0.06	111717 0032	196,80
3.3	4	140	80	0.07	111717 0033	196,80
3.4	4	140	85	0.07	111717 0034	196,80
3.5	4	140	85	0.07	111717 0035	196,80
3.6	4	140	85	0.07	111717 0036	196,80
3.7	4	140	85	0.07	111717 0037	196,80
3.8	4	140	90	0.08	111717 0038	196,80
3.9	4	140	90	0.08	111717 0039	196,80
4	4	140	90	0.08	111717 0040	196,80
4.1	6	165	100	0.08	111717 0041	211,40
4.2	6	165	100	0.08	111717 0042	211,40
4.3	6	165	110	0.09	111717 0043	211,40
4.4	6	165	110	0.09	111717 0044	211,40
4.5	6	165	110	0.09	111717 0045	211,40
4.6	6	165	110	0.09	111717 0046	223,70
4.7	6	165	110	0.09	111717 0047	223,70
4.8	6	165	115	0.1	111717 0048	223,70
4.9	6	165	115	0.1	111717 0049	223,70
5	6	165	115	0.1	111717 0050	223,70
5.1	6	190	120	0.1	111717 0051	228,50
5.2	6	190	120	0.1	111717 0052	228,50
5.3	6	190	120	0.11	111717 0053	228,50
5.4	6	190	140	0.11	111717 0054	228,50

1107

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
5.5	6	190	140	0.11	111717 0055	228,50
5.6	6	190	140	0.11	111717 0056	239,50
5.7	6	190	140	0.11	111717 0057	239,50
5.8	6	190	140	0.12	111717 0058	239,50
5.9	6	190	140	0.12	111717 0059	239,50
6	6	190	140	0.12	111717 0060	239,50
6.1	8	210	155	0.12	111717 0061	256,70
6.2	8	210	155	0.12	111717 0062	256,70
6.3	8	210	155	0.13	111717 0063	256,70
6.4	8	210	155	0.13	111717 0064	256,70
6.5	8	210	155	0.13	111717 0065	256,70
6.6	8	210	155	0.13	111717 0066	267,60
6.7	8	210	155	0.13	111717 0067	267,60
6.8	8	210	160	0.14	111717 0068	267,60
6.9	8	210	160	0.14	111717 0069	267,60
7	8	210	160	0.14	111717 0070	267,60
7.1	8	230	170	0.14	111717 0071	283,50
7.2	8	230	170	0.14	111717 0072	283,50
7.3	8	230	170	0.15	111717 0073	283,50
7.4	8	230	170	0.15	111717 0074	283,50
7.5	8	230	170	0.15	111717 0075	283,50
7.6	8	230	180	0.15	111717 0076	299,20
7.7	8	230	180	0.15	111717 0077	299,20
7.8	8	230	180	0.16	111717 0078	299,20
7.9	8	230	180	0.16	111717 0079	299,20

1107

Continued on next page >>>


D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
8	8	230	180	0.16	111717 0080	299,20
8.1	10	260	195	0.16	111717 0081	329,60
8.2	10	260	195	0.16	111717 0082	329,60
8.3	10	260	195	0.17	111717 0083	329,60
8.4	10	260	195	0.17	111717 0084	329,60
8.5	10	260	195	0.17	111717 0085	329,60
8.6	10	260	210	0.17	111717 0086	334,-
8.7	10	260	210	0.17	111717 0087	334,-
8.8	10	260	210	0.18	111717 0088	334,-
8.9	10	260	210	0.18	111717 0089	334,-
9	10	260	210	0.18	111717 0090	334,-
9.1	10	290	220	0.18	111717 0091	368,80
9.2	10	290	220	0.18	111717 0092	368,80
9.3	10	290	220	0.19	111717 0093	368,80
9.4	10	290	220	0.19	111717 0094	368,80
9.5	10	290	220	0.19	111717 0095	368,80
9.6	10	290	230	0.19	111717 0096	368,80
9.7	10	290	230	0.19	111717 0097	368,80
9.8	10	290	230	0.2	111717 0098	368,80
9.9	10	290	230	0.2	111717 0099	368,80
10	10	290	230	0.2	111717 0100	368,80


1107





D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
10.1	12	310	250	0.2	111717 0101	405,70
10.2	12	310	250	0.2	111717 0102	405,70
10.3	12	310	250	0.21	111717 0103	405,70
10.4	12	310	250	0.21	111717 0104	405,70
10.5	12	310	250	0.21	111717 0105	405,70
10.6	12	310	250	0.21	111717 0106	405,70
10.7	12	310	250	0.21	111717 0107	405,70
10.8	12	310	250	0.22	111717 0108	405,70
10.9	12	310	250	0.22	111717 0109	405,70
11	12	310	250	0.22	111717 0110	405,70
11.1	12	330	270	0.22	111717 0111	446,20
11.2	12	330	270	0.22	111717 0112	446,20
11.3	12	330	270	0.23	111717 0113	446,20
11.4	12	330	270	0.23	111717 0114	446,20
11.5	12	330	270	0.23	111717 0115	446,20
11.6	12	330	270	0.23	111717 0116	446,20
11.7	12	330	270	0.23	111717 0117	446,20
11.8	12	330	270	0.24	111717 0118	446,20
11.9	12	330	270	0.24	111717 0119	446,20
12	12	330	270	0.24	111717 0120	446,20

1107

### Solid carbide deep-hole drill ADO-30D

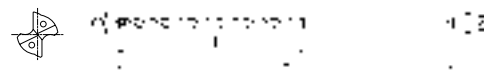






379

- With optimised shank diameter tolerance, suitable for use in shrink-fit holders
- **Cutting material: SC EgiAs-coated**
- High-performance drill for cost-efficient manufacturing of deep bores up to 30xD with no step
- Optimum chip removal with special cutting geometry and large chip spaces
- True running accuracy of the tool when clamped: max. 0.02mm
- Cutting edge tolerance e8

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	○	○		●	●											
		60-125	60-125	60-120	40-80	40-80		60-125	50-80											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	3	150	100	0.06	111718 0030	241,20
3.1	4	185	102	0.06	111718 0031	270,80
3.2	4	185	105	0.06	111718 0032	270,80
3.3	4	185	109	0.07	111718 0033	270,80
3.4	4	185	112	0.07	111718 0034	270,80
3.5	4	185	116	0.07	111718 0035	270,80
3.6	4	185	116	0.07	111718 0036	270,80
3.7	4	185	116	0.07	111718 0037	270,80
3.8	4	185	132	0.08	111718 0038	270,80
3.9	4	185	132	0.08	111718 0039	270,80
4	4	185	132	0.08	111718 0040	270,80
4.1	6	215	140	0.08	111718 0041	297,90
4.2	6	215	140	0.08	111718 0042	297,90

1107

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
4.3	6	215	150	0.09	111718 0043	297,90
4.4	6	215	150	0.09	111718 0044	297,90
4.5	6	215	150	0.09	111718 0045	297,90
4.6	6	215	150	0.09	111718 0046	297,90
4.7	6	215	150	0.09	111718 0047	297,90
4.8	6	215	165	0.1	111718 0048	297,90
4.9	6	215	165	0.1	111718 0049	297,90
5	6	215	165	0.1	111718 0050	297,90
5.1	6	250	180	0.1	111718 0051	304,-
5.2	6	250	180	0.1	111718 0052	304,-
5.3	6	250	180	0.11	111718 0053	304,-
5.4	6	250	200	0.11	111718 0054	304,-
5.5	6	250	200	0.11	111718 0055	304,-

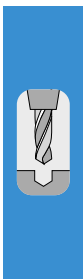
1107

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
5.6	6	250	200	0.11	111718 0056	319,90
5.7	6	250	200	0.11	111718 0057	319,90
5.8	6	250	200	0.12	111718 0058	319,90
5.9	6	250	200	0.12	111718 0059	319,90
6	6	250	200	0.12	111718 0060	319,90
6.1	8	280	215	0.12	111718 0061	343,30
6.2	8	280	215	0.12	111718 0062	343,30
6.3	8	280	215	0.13	111718 0063	343,30
6.4	8	280	215	0.13	111718 0064	343,30
6.5	8	280	215	0.13	111718 0065	343,30
6.6	8	280	215	0.13	111718 0066	356,60
6.7	8	280	215	0.13	111718 0067	356,60
6.8	8	280	230	0.14	111718 0068	356,60
6.9	8	280	230	0.14	111718 0069	356,60
7	8	280	230	0.14	111718 0070	356,60
7.1	8	315	250	0.14	111718 0071	376,60
7.2	8	315	250	0.14	111718 0072	376,60
7.3	8	315	250	0.15	111718 0073	376,60
7.4	8	315	250	0.15	111718 0074	376,60
7.5	8	315	250	0.15	111718 0075	376,60
7.6	8	315	265	0.15	111718 0076	396,90
7.7	8	315	265	0.15	111718 0077	396,90
7.8	8	315	265	0.16	111718 0078	396,90

1107

D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
7.9	8	315	265	0.16	111718 0079	396,90
8	8	315	265	0.16	111718 0080	396,90
8.1	10	350	280	0.16	111718 0081	416,80
8.2	10	350	280	0.16	111718 0082	416,80
8.3	10	350	280	0.17	111718 0083	416,80
8.4	10	350	280	0.17	111718 0084	416,80
8.5	10	350	280	0.17	111718 0085	416,80
8.6	10	350	300	0.17	111718 0086	436,50
8.7	10	350	300	0.17	111718 0087	436,50
8.8	10	350	300	0.18	111718 0088	436,50
8.9	10	350	300	0.18	111718 0089	436,50
9	10	350	300	0.18	111718 0090	436,50
9.1	10	390	315	0.18	111718 0091	480,10
9.2	10	390	315	0.18	111718 0092	480,10
9.3	10	390	315	0.19	111718 0093	480,10
9.4	10	390	315	0.19	111718 0094	480,10
9.5	10	390	315	0.19	111718 0095	480,10
9.6	10	390	330	0.19	111718 0096	480,10
9.7	10	390	330	0.19	111718 0097	480,10
9.8	10	390	330	0.2	111718 0098	480,10
9.9	10	390	330	0.2	111718 0099	480,10
10	10	390	330	0.2	111718 0100	480,10

1107



### Solid carbide deep-hole drill ADO-40D

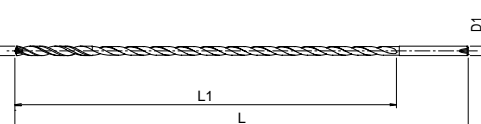
NEW

VHM
Werk-norm
Typ TLP
140°
25°
40xD
DIN 6535 HA
TiAlN
i Vc/fz
379

- With optimised shank diameter tolerance, suitable for use in shrink-fit holders
- **Cutting material: SC EgiAs-coated**
- High-performance drill for cost-efficient manufacturing of deep bores up to 40xD with no step
- Optimum chip removal with special cutting geometry and large chip spaces
- True running accuracy of the tool when clamped: max. 0.02mm
- Cutting edge tolerance e8

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	○	○		●	●									
		60-90	60-90	50-80	40-60	40-60		60-90	50-80									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	3	179	120	0.06	111719 0030	351,-
4	4	222	160	0.08	111719 0040	373,40
5	5	265	200	0.1	111719 0050	409,80
6	6	308	240	0.12	111719 0060	441,10
8	8	394	320	0.16	111719 0080	547,20
10	10	490	400	0.2	111719 0100	662,-

1107

## Solid carbide deep-hole drill ADO-50D

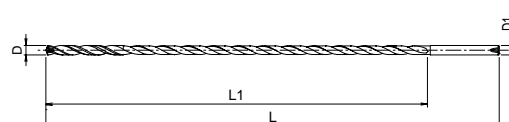
NEW

VHM Werks-norm Typ TLP 140° 25° 50xD 6535 HA TiAlN *i* Vc/fz 379

- With optimised shank diameter tolerance, suitable for use in shrink-fit holders
- **Cutting material: SC EgiAs-coated**
- High-performance drill for cost-efficient manufacturing of deep bores up to 50xD with no step
- Optimum chip removal with special cutting geometry and large chip spaces
- True running accuracy of the tool when clamped: max. 0.02mm
- Cutting edge tolerance e8

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	<700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	<55 HRc	<60 HRc	≥60 HRc		
		60-90	60-90	50-80	40-60	40-60		60-90	50-80									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	3	209	150	0.06	111720 0030	386,10
4	4	262	200	0.08	111720 0040	410,70
5	5	315	250	0.1	111720 0050	449,40
6	6	368	300	0.12	111720 0060	485,20
8	8	474	400	0.16	111720 0080	601,80

1107

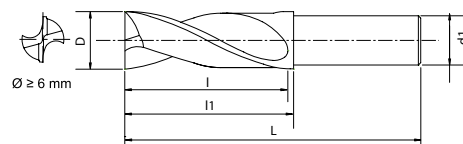
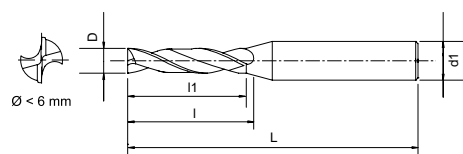
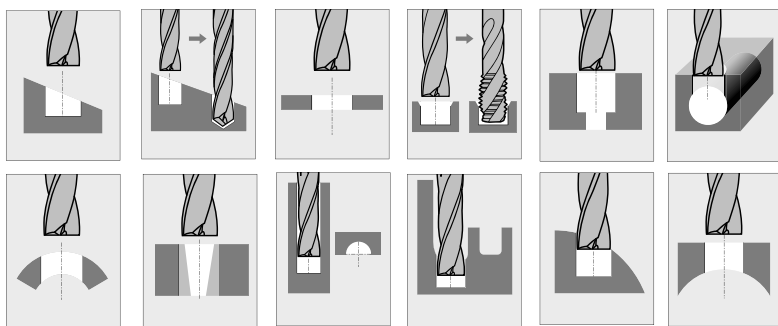
## ADF-2D solid carbide flat drill

VHM Werks-norm Typ N 180° 20° 2xD TiAlN *i* Vc/fz 382

- Suitable for a variety of applications, such as inclined surfaces, round surfaces, shallow drilling and eccentric drilling etc.
- **Cutting material: solid carbide, EgiAs-coating**
- Outstanding wear resistance thanks to new EgiAs coating
- **Reduced cutting forces thanks to innovative cutting edge geometry**
- Large chip space and adapted point thinning



Long version available on request



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	<700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	<55 HRc	<60 HRc	≥60 HRc		
		60-100	30-90	20-40				60-120	50-80			80-200	80-200			20-30		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D h8 mm	L mm	l mm	l1 mm	d1 mm	art.no.	€
2	50	10.3	10	4	111711 0200	58,70
2.1	50	10.5	10	4	111711 0210	58,70
2.2	50	11	10.6	4	111711 0220	58,70
2.3	50	11	10.8	4	111711 0230	58,70
2.32	50	11	10.9	4	111711 0232	58,70

1107

D h8 mm	L mm	l mm	l1 mm	d1 mm	art.no.	€
2.4	50	12	11	4	111711 0240	58,70
2.42	50	12	11.1	4	111711 0242	58,70
2.5	50	12	11.2	4	111711 0250	58,70
2.54	50	12	11.3	4	111711 0254	58,70
2.58	50	12	11.4	4	111711 0258	58,70

1107

D h8 mm	L mm	l mm	l1 mm	d1 mm	art.no.	€
2.6	50	13	11.4	4	111711 0260	58,70
2.7	50	13	11.6	4	111711 0270	58,70
2.76	50	13	11.7	4	111711 0276	58,70
2.78	50	13	11.7	4	111711 0278	58,70
2.8	50	14	11.8	4	111711 0280	58,70

1107

D h8 mm	L mm	l mm	l1 mm	d1 mm	art.no.	€
2.9	50	14	11.9	4	111711 0290	58,70
3	55	15	11.4	6	111711 0300	58,70
3.03	55	15	11.5	6	111711 0303	63,20
3.1	55	15	11.6	6	111711 0310	63,20
3.15	55	15	11.7	6	111711 0315	63,20
3.2	55	15	11.8	6	111711 0320	63,20
3.3	55	15	12	6	111711 0330	63,20
3.4	55	16	12.1	6	111711 0340	63,20
3.5	55	16	12.3	6	111711 0350	63,20
3.53	55	16	12.4	6	111711 0353	66,40
3.6	55	16	12.5	6	111711 0360	66,40
3.66	55	16	12.6	6	111711 0366	66,40
3.68	55	16	12.7	6	111711 0368	66,40
3.7	55	16	12.7	6	111711 0370	66,40
3.8	60	19	17.9	6	111711 0380	66,40
3.9	60	19	18.1	6	111711 0390	66,40
4	60	19	18.3	6	111711 0400	66,40
4.03	60	19	18.3	6	111711 0403	71,10
4.1	60	19	18.5	6	111711 0410	71,10
4.2	60	21	18.6	6	111711 0420	71,10
4.3	60	21	18.8	6	111711 0430	71,10
4.4	60	21	19	6	111711 0440	71,10
4.5	60	21	19.2	6	111711 0450	71,10
4.53	60	21	19.3	6	111711 0453	76,30
4.6	60	21	19.4	6	111711 0460	76,30
4.62	60	21	19.4	6	111711 0462	76,30
4.64	60	21	19.5	6	111711 0464	76,30
4.7	60	21	19.6	6	111711 0470	76,30
4.8	65	24.8	24	6	111711 0480	76,30
4.9	65	24.9	24	6	111711 0490	76,30
5	65	25.1	24	6	111711 0500	76,30
5.03	65	25.2	24	6	111711 0503	80,50
5.1	65	25.3	24	6	111711 0510	80,50
5.2	65	25.5	24	6	111711 0520	80,50
5.3	65	25.7	24	6	111711 0530	80,50
5.4	65	27	25.9	6	111711 0540	80,50
5.5	65	27	26.1	6	111711 0550	80,50
5.52	65	27	26.1	6	111711 0552	84,30
5.54	65	27	26.1	6	111711 0554	84,30
5.6	65	27	26.3	6	111711 0560	84,30
5.7	65	27	26.4	6	111711 0570	84,30
5.8	65	27	26.6	6	111711 0580	84,30
5.9	65	27	26.8	6	111711 0590	84,30
6	65	27	27	6	111711 0600	84,30
6.03	70	30	32	6	111711 0603	84,30
6.1	70	30	32	6	111711 0610	84,30
6.2	70	30	32	6	111711 0620	84,30
6.3	70	30	32	6	111711 0630	84,30
6.4	70	30	32	6	111711 0640	84,30
6.5	70	30	32	6	111711 0650	84,30
6.53	70	30	32	6	111711 0653	89,70
6.6	70	30	32	6	111711 0660	89,70
6.7	70	30	32	6	111711 0670	89,70
6.8	70	30	32	6	111711 0680	89,70
6.9	70	30	32	6	111711 0690	89,70
7	70	30	32	6	111711 0700	89,70
7.03	75	34	36	6	111711 0703	95,-
7.1	75	34	36	6	111711 0710	95,-
7.2	75	34	36	6	111711 0720	95,-
7.3	75	34	36	6	111711 0730	95,-
7.4	75	34	36	6	111711 0740	95,-

1107

D h8 mm	L mm	l mm	l1 mm	d1 mm	art.no.	€
7.5	75	34	36	6	111711 0750	95,-
7.6	75	34	36	6	111711 0760	100,20
7.7	75	34	36	6	111711 0770	100,20
7.8	75	34	36	6	111711 0780	100,20
7.9	75	34	36	6	111711 0790	100,20
8	75	34	36	8	111711 0800	100,20
8.03	80	38	40	8	111711 0803	105,50
8.1	80	38	40	8	111711 0810	105,50
8.2	80	38	40	8	111711 0820	105,50
8.3	80	38	40	8	111711 0830	105,50
8.4	80	38	40	8	111711 0840	105,50
8.5	80	38	40	8	111711 0850	105,50
8.53	80	38	40	8	111711 0853	110,70
8.6	80	38	40	8	111711 0860	110,70
8.7	80	38	40	8	111711 0870	110,70
8.8	80	38	40	8	111711 0880	110,70
8.9	80	38	40	8	111711 0890	110,70
9	80	38	40	8	111711 0900	110,70
9.03	85	42	44	8	111711 0903	115,80
9.1	85	42	44	8	111711 0910	115,80
9.2	85	42	44	8	111711 0920	115,80
9.3	85	42	44	8	111711 0930	115,80
9.4	85	42	44	8	111711 0940	115,80
9.5	85	42	44	8	111711 0950	115,80
9.6	85	42	44	8	111711 0960	121,10
9.7	85	42	44	8	111711 0970	121,10
9.8	85	42	44	8	111711 0980	121,10
9.9	85	42	44	8	111711 0990	121,10
10	85	42	44	10	111711 1000	121,10
10.03	90	46	48	10	111711 1003	126,20
10.1	90	46	48	10	111711 1010	126,20
10.2	90	46	48	10	111711 1020	126,20
10.3	90	46	48	10	111711 1030	126,20
10.4	90	46	48	10	111711 1040	126,20
10.5	90	46	48	10	111711 1050	126,20
10.6	90	46	48	10	111711 1060	131,40
10.7	90	46	48	10	111711 1070	131,40
10.8	90	46	48	10	111711 1080	131,40
10.9	90	46	48	10	111711 1090	131,40
11	90	46	48	10	111711 1100	131,40
11.03	95	50	52	10	111711 1103	136,70
11.1	95	50	52	10	111711 1110	136,70
11.2	95	50	52	10	111711 1120	136,70
11.3	95	50	52	10	111711 1130	136,70
11.4	95	50	52	10	111711 1140	136,70
11.5	95	50	52	10	111711 1150	136,70
11.6	95	50	52	10	111711 1160	142,10
11.7	95	50	52	10	111711 1170	142,10
11.8	95	50	52	10	111711 1180	142,10
11.9	95	50	52	10	111711 1190	142,10
12	95	50	52	12	111711 1200	142,10
12.03	100	56	58	12	111711 1203	164,30
12.1	100	56	58	12	111711 1210	164,30
12.2	100	56	58	12	111711 1220	164,30
12.3	100	56	58	12	111711 1230	164,30
12.4	100	56	58	12	111711 1240	164,30
12.5	100	56	58	12	111711 1250	164,30
12.6	100	56	58	12	111711 1260	165,20
12.7	100	56	58	12	111711 1270	165,20
12.8	100	56	58	12	111711 1280	165,20
12.9	100	56	58	12	111711 1290	165,20

1107

D h8 mm	L mm	l mm	l1 mm	d1 mm	art.no.	€
13	100	56	58	12	111711 1300	165,20
13.1	105	60	62	12	111711 1310	200,70
13.2	105	60	62	12	111711 1320	200,70
13.3	105	60	62	12	111711 1330	200,70
13.4	105	60	62	12	111711 1340	200,70
13.5	105	60	62	12	111711 1350	200,70
13.6	105	60	62	12	111711 1360	200,70
13.7	105	60	62	12	111711 1370	200,70
13.8	105	60	62	12	111711 1380	200,70
13.9	105	60	62	12	111711 1390	200,70
14	105	60	62	12	111711 1400	200,70
14.1	110	64	66	12	111711 1410	222,30
14.2	110	64	66	12	111711 1420	222,30
14.3	110	64	66	12	111711 1430	222,30
14.4	110	64	66	12	111711 1440	222,30
14.5	110	64	66	12	111711 1450	222,30
14.6	110	64	66	12	111711 1460	222,30
14.7	110	64	66	12	111711 1470	222,30
14.8	110	64	66	12	111711 1480	222,30
14.9	110	64	66	12	111711 1490	222,30
15	110	64	66	12	111711 1500	222,30
15.1	115	68	70	12	111711 1510	251,90
15.2	115	68	70	12	111711 1520	251,90
15.3	115	68	70	12	111711 1530	251,90
15.4	115	68	70	12	111711 1540	251,90
15.5	115	68	70	12	111711 1550	251,90
15.6	115	68	70	12	111711 1560	251,90
15.7	115	68	70	12	111711 1570	251,90
15.8	115	68	70	12	111711 1580	251,90
15.9	115	68	70	12	111711 1590	251,90
16	115	68	70	16	111711 1600	251,90
16.5	125	74	76	16	111711 1650	345,50
17	125	74	76	16	111711 1700	345,50
17.5	130	78	80	16	111711 1750	356,60
18	130	78	80	16	111711 1800	356,60
18.5	135	84	86	16	111711 1850	390,-
19	135	84	86	16	111711 1900	390,-
19.5	140	88	90	16	111711 1950	443,50
20	140	88	90	20	111711 2000	443,50

1107





**ATORN® Solid carbide flat drill FLAT 3D with internal cooling**

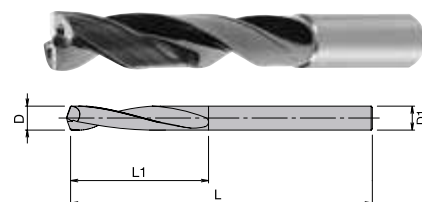
VHM    Werks-norm    Typ N    180°    30°    3xD    DIN 6535 HA    TiAlN    *i* Vc/fz    378

- For producing flat-bottomed holes in one single operation
- Facilitates drilling in a single operation on inclined surfaces
- Improved drilling quality with special cutting and 4-guide chamfer geometry
- Better self-centring



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		100	90	40	40	25		80	80				220	180	120		25		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D m7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
3	6	62	14	0.08	111709 0030	76,80
3.1	6	62	14	0.08	111709 0031	76,80
3.2	6	62	14	0.08	111709 0032	76,80
3.3	6	62	14	0.08	111709 0033	76,80
3.4	6	62	14	0.08	111709 0034	76,80
3.5	6	62	14	0.08	111709 0035	76,80
3.6	6	62	14	0.08	111709 0036	76,80
3.7	6	62	14	0.08	111709 0037	76,80
3.8	6	66	17	0.08	111709 0038	76,80
3.9	6	66	17	0.08	111709 0039	76,80
4	6	66	17	0.08	111709 0040	76,80
4.1	6	66	17	0.08	111709 0041	76,80
4.2	6	66	17	0.08	111709 0042	76,80
4.3	6	66	17	0.08	111709 0043	76,80
4.4	6	66	17	0.08	111709 0044	76,80
4.5	6	66	17	0.08	111709 0045	76,80
4.6	6	66	17	0.08	111709 0046	76,80
4.65	6	66	17	0.08	111709 0465	76,80
4.7	6	66	17	0.08	111709 0047	76,80
4.8	6	66	20	0.08	111709 0048	76,80
4.9	6	66	20	0.08	111709 0049	76,80
5	6	66	20	0.12	111709 0050	76,80
5.1	6	66	20	0.12	111709 0051	76,80
5.2	6	66	20	0.12	111709 0052	76,80
5.3	6	66	20	0.12	111709 0053	76,80
5.4	6	66	20	0.12	111709 0054	76,80
5.5	6	66	20	0.12	111709 0055	76,80
5.55	6	66	20	0.12	111709 0555	76,80
5.6	6	66	20	0.12	111709 0056	76,80
5.7	6	66	20	0.12	111709 0057	76,80
5.8	6	66	20	0.12	111709 0058	76,80
5.9	6	66	20	0.12	111709 0059	76,80
6	6	66	20	0.12	111709 0060	76,80
6.1	8	79	24	0.12	111709 0061	93,10
6.2	8	79	24	0.12	111709 0062	93,10
6.3	8	79	24	0.12	111709 0063	93,10
6.4	8	79	24	0.12	111709 0064	93,10
6.5	8	79	24	0.12	111709 0065	93,10
6.6	8	79	24	0.12	111709 0066	93,10

1154

D m7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
6.7	8	79	24	0.12	111709 0067	93,10
6.8	8	79	24	0.12	111709 0068	93,10
6.9	8	79	24	0.12	111709 0069	93,10
7	8	79	24	0.12	111709 0070	93,10
7.1	8	79	29	0.12	111709 0071	93,10
7.2	8	79	29	0.12	111709 0072	93,10
7.3	8	79	29	0.12	111709 0073	93,10
7.4	8	79	29	0.12	111709 0074	93,10
7.5	8	79	29	0.12	111709 0075	93,10
7.6	8	79	29	0.12	111709 0076	93,10
7.7	8	79	29	0.12	111709 0077	93,10
7.8	8	79	29	0.12	111709 0078	93,10
7.9	8	79	29	0.12	111709 0079	93,10
8	8	79	29	0.12	111709 0080	93,10
8.1	10	89	35	0.15	111709 0081	127,-
8.2	10	89	35	0.15	111709 0082	127,-
8.3	10	89	35	0.15	111709 0083	127,-
8.4	10	89	35	0.15	111709 0084	127,-
8.5	10	89	35	0.15	111709 0085	127,-
8.6	10	89	35	0.15	111709 0086	127,-
8.7	10	89	35	0.15	111709 0087	127,-
8.8	10	89	35	0.15	111709 0088	127,-
8.9	10	89	35	0.15	111709 0089	127,-
9	10	89	35	0.15	111709 0090	127,-
9.1	10	89	35	0.15	111709 0091	127,-
9.3	10	89	35	0.15	111709 0092	127,-
9.4	10	89	35	0.15	111709 0094	127,-
9.5	10	89	35	0.15	111709 0095	127,-
9.6	10	89	35	0.15	111709 0096	127,-
9.7	10	89	35	0.15	111709 0097	127,-
9.8	10	89	35	0.15	111709 0098	127,-
9.9	10	89	35	0.15	111709 0099	127,-
10	10	89	35	0.15	111709 0100	127,-
10.1	12	102	40	0.15	111709 0101	159,50
10.2	12	102	40	0.15	111709 0102	159,50
10.3	12	102	40	0.15	111709 0103	159,50
10.4	12	102	40	0.15	111709 0104	159,50
10.5	12	102	40	0.15	111709 0105	159,50
10.6	12	102	40	0.15	111709 0106	159,50

1154

D m7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
10.7	12	102	40	0.15	111709 0107	159,50
10.8	12	102	40	0.15	111709 0108	159,50
10.9	12	102	40	0.15	111709 0109	159,50
11	12	102	40	0.15	111709 0110	159,50
11.1	12	102	40	0.15	111709 0111	159,50
11.2	12	102	40	0.15	111709 0112	159,50
11.3	12	102	40	0.15	111709 0113	159,50
11.4	12	102	40	0.15	111709 0114	159,50
11.5	12	102	40	0.15	111709 0115	159,50
11.6	12	102	40	0.15	111709 0116	159,50
11.7	12	102	40	0.15	111709 0117	159,50
11.8	12	102	40	0.15	111709 0118	159,50
11.9	12	102	40	0.15	111709 0119	159,50
12	12	102	40	0.15	111709 0120	159,50
12.5	14	107	43	0.16	111709 0125	260,-
12.8	14	107	43	0.16	111709 0128	260,-
13	14	107	43	0.16	111709 0130	260,-
13.5	14	107	43	0.16	111709 0135	260,-
13.8	14	107	43	0.16	111709 0138	260,-

1154

D m7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
14	14	107	43	0.16	111709 0140	260,-
14.5	16	115	45	0.16	111709 0145	326,-
14.8	16	115	45	0.16	111709 0148	326,-
15	16	115	45	0.16	111709 0150	326,-
15.5	16	115	45	0.16	111709 0155	326,-
15.8	16	115	45	0.16	111709 0158	326,-
16	16	115	45	0.16	111709 0160	326,-
16.5	18	123	51	0.2	111709 0165	440,-
16.8	18	123	51	0.2	111709 0168	440,-
17	18	123	51	0.2	111709 0170	440,-
17.5	18	123	51	0.2	111709 0175	440,-
17.8	18	123	51	0.2	111709 0178	440,-
18	18	123	51	0.2	111709 0180	440,-
18.5	20	131	55	0.2	111709 0185	539,-
18.8	20	131	55	0.2	111709 0188	539,-
19	20	131	55	0.2	111709 0190	539,-
19.5	20	131	55	0.2	111709 0195	539,-
19.8	20	131	55	0.23	111709 0198	539,-
20	20	131	55	0.23	111709 0200	539,-

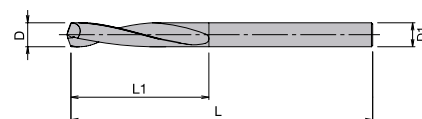
1154



### ATORN® Solid carbide flat drill FLAT 5D with internal cooling

VHM
Werks-norm
Typ N
180°
30°
5xD
DIN 6535 HA
TiAlN
i Vc/fz
378

- For producing flat-bottomed holes in a single operation
- facilitates drilling in a single operation on inclined surfaces
- Improved drilling quality with special cutting and 4-guide chamfer geometry
- better self-centering



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		100	90	40	40	25		80	80			220	180	120		25			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D m7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3	6	66	28	0.08	111710 0030	91,10
3.1	6	66	28	0.08	111710 0031	91,10
3.2	6	66	28	0.08	111710 0032	91,10
3.3	6	66	28	0.08	111710 0033	91,10
3.4	6	66	28	0.08	111710 0034	91,10
3.5	6	66	28	0.08	111710 0035	91,10
3.6	6	66	28	0.08	111710 0036	91,10
3.7	6	66	28	0.08	111710 0037	91,10
3.8	6	74	36	0.08	111710 0038	91,10
3.9	6	74	36	0.08	111710 0039	91,10
4	6	74	36	0.08	111710 0040	91,10
4.1	6	74	36	0.08	111710 0041	91,10
4.2	6	74	36	0.08	111710 0042	91,10
4.3	6	74	36	0.08	111710 0043	91,10
4.4	6	74	36	0.08	111710 0044	91,10
4.5	6	74	36	0.08	111710 0045	91,10
4.6	6	74	36	0.08	111710 0046	91,10
4.65	6	74	36	0.08	111710 0465	91,10

1154

D m7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
4.7	6	74	36	0.08	111710 0047	91,10
4.8	6	82	44	0.08	111710 0048	91,10
4.9	6	82	44	0.08	111710 0049	91,10
5	6	82	44	0.12	111710 0050	91,10
5.1	6	82	44	0.12	111710 0051	91,10
5.2	6	82	44	0.12	111710 0052	91,10
5.3	6	82	44	0.12	111710 0053	91,10
5.4	6	82	44	0.12	111710 0054	91,10
5.5	6	82	44	0.12	111710 0055	91,10
5.55	6	82	44	0.12	111710 0555	91,10
5.6	6	82	44	0.12	111710 0056	91,10
5.7	6	82	44	0.12	111710 0057	91,10
5.8	6	82	44	0.12	111710 0058	91,10
5.9	6	82	44	0.12	111710 0059	91,10
6	6	82	44	0.12	111710 0060	91,10
6.1	8	91	53	0.12	111710 0061	103,-
6.2	8	91	53	0.12	111710 0062	103,-
6.3	8	91	53	0.12	111710 0063	103,-

Continued on next page >>>

D m7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
6.4	8	91	53	0.12	111710 0064	103,-
6.5	8	91	53	0.12	111710 0065	103,-
6.6	8	91	53	0.12	111710 0066	103,-
6.7	8	91	53	0.12	111710 0067	103,-
6.8	8	91	53	0.12	111710 0068	103,-
6.9	8	91	53	0.12	111710 0069	103,-
7	8	91	53	0.12	111710 0070	103,-
7.1	8	91	53	0.12	111710 0071	103,-
7.2	8	91	53	0.12	111710 0072	103,-
7.3	8	91	53	0.12	111710 0073	103,-
7.4	8	91	53	0.12	111710 0074	103,-
7.5	8	91	53	0.12	111710 0075	103,-
7.6	8	91	53	0.12	111710 0076	103,-
7.7	8	91	53	0.12	111710 0077	103,-
7.8	8	91	53	0.12	111710 0078	103,-
7.9	8	91	53	0.12	111710 0079	103,-
8	8	91	53	0.12	111710 0080	103,-
8.1	10	103	61	0.15	111710 0081	144,50
8.2	10	103	61	0.15	111710 0082	144,50
8.3	10	103	61	0.15	111710 0083	144,50
8.4	10	103	61	0.15	111710 0084	144,50
8.5	10	103	61	0.15	111710 0085	144,50
8.6	10	103	61	0.15	111710 0086	144,50
8.7	10	103	61	0.15	111710 0087	144,50
8.8	10	103	61	0.15	111710 0088	144,50
8.9	10	103	61	0.15	111710 0089	144,50
9	10	103	61	0.15	111710 0090	144,50
9.1	10	103	1	0.15	111710 0091	144,50
9.2	10	103	61	0.15	111710 0092	144,50
9.3	10	103	61	0.15	111710 0093	144,50
9.4	10	103	61	0.15	111710 0094	144,50
9.5	10	103	61	0.15	111710 0095	144,50
9.6	10	103	61	0.15	111710 0096	144,50
9.7	10	103	61	0.15	111710 0097	144,50
9.8	10	103	61	0.15	111710 0098	144,50
9.9	10	103	61	0.15	111710 0099	144,50
10	10	103	61	0.15	111710 0100	144,50
10.1	12	116	69	0.15	111710 0101	199,50
10.2	12	116	69	0.15	111710 0102	199,50
10.3	12	116	69	0.15	111710 0103	199,50
10.4	12	116	69	0.15	111710 0104	199,50

1154

D m7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
10.5	12	116	69	0.15	111710 0105	199,50
10.6	12	116	69	0.15	111710 0106	199,50
10.7	12	116	69	0.15	111710 0107	199,50
10.8	12	116	69	0.15	111710 0108	199,50
10.9	12	116	69	0.15	111710 0109	199,50
11	12	116	69	0.15	111710 0110	199,50
11.1	12	116	69	0.15	111710 0111	199,50
11.2	12	116	69	0.15	111710 0112	199,50
11.3	12	116	69	0.15	111710 0113	199,50
11.4	12	116	69	0.15	111710 0114	199,50
11.5	12	116	69	0.15	111710 0115	199,50
11.6	12	116	69	0.15	111710 0116	199,50
11.7	12	116	69	0.15	111710 0117	199,50
11.8	12	116	69	0.15	111710 0118	199,50
11.9	12	116	69	0.15	111710 0119	199,50
12	12	116	69	0.15	111710 0120	199,50
12.5	14	122	75	0.16	111710 0125	280,-
12.8	14	122	75	0.16	111710 0128	280,-
13	14	122	75	0.16	111710 0130	280,-
13.5	14	122	75	0.16	111710 0135	280,-
13.8	14	122	75	0.16	111710 0138	280,-
14	14	122	75	0.16	111710 0140	280,-
14.5	16	131	81	0.16	111710 0145	341,-
14.8	16	131	81	0.16	111710 0148	341,-
15	16	131	81	0.16	111710 0150	341,-
15.5	16	131	81	0.16	111710 0155	341,-
15.8	16	131	81	0.16	111710 0158	341,-
16	16	131	81	0.16	111710 0160	341,-
16.5	18	141	91	0.2	111710 0165	450,-
16.8	18	141	91	0.2	111710 0168	450,-
17	18	141	91	0.2	111710 0170	450,-
17.5	18	141	91	0.2	111710 0175	450,-
17.8	18	141	91	0.2	111710 0178	450,-
18	18	141	91	0.2	111710 0180	450,-
18.5	20	151	99	0.2	111710 0185	569,-
18.8	20	151	99	0.2	111710 0188	569,-
19	20	151	99	0.2	111710 0190	569,-
19.5	20	151	99	0.2	111710 0195	569,-
19.8	20	151	99	0.23	111710 0198	569,-
20	20	151	99	0.23	111710 0200	569,-

1154



Multifunctional ...

... with indexable insert.

**ATORN**<sup>®</sup>  
Performance demands quality

**ATORN® Solid carbide high-performance drill bit HIGH FEED 5D**

**NEW**



- 3-edged drill for high feed rate
- Cutting material: Ultra micro-grain SC TiAlNplus
- special HFD point thinning reduces cutting forces and generates short chip breaking
- large chip spaces allow good chip removal
- optimum centring characteristics

*for high feed rate*

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	○	○		●	●											
		80-120	60-100	60-90	60-75	60-75		80-120	60-100											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	D1 h6 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
3	28	66	6	0.12	111585 0300	89,-
3.1	28	66	6	0.12	111585 0310	89,-
3.2	28	66	6	0.13	111585 0320	89,-
3.3	28	66	6	0.13	111585 0330	89,-
3.4	28	66	6	0.14	111585 0340	89,-
3.5	28	66	6	0.14	111585 0350	89,-
3.6	28	66	6	0.14	111585 0360	89,-
3.7	28	66	6	0.15	111585 0370	89,-
3.8	36	74	6	0.15	111585 0380	89,-
3.9	36	74	6	0.16	111585 0390	89,-
4	36	74	6	0.16	111585 0400	89,-
4.1	36	74	6	0.16	111585 0410	89,-
4.2	36	74	6	0.17	111585 0420	89,-
4.3	36	74	6	0.17	111585 0430	89,-
4.4	36	74	6	0.18	111585 0440	89,-
4.5	36	74	6	0.18	111585 0450	89,-
4.6	36	74	6	0.18	111585 0460	89,-
4.7	36	74	6	0.19	111585 0470	89,-
4.8	44	82	6	0.19	111585 0480	89,-
4.9	44	82	6	0.2	111585 0490	89,-
5	44	82	6	0.2	111585 0500	89,-
5.1	44	82	6	0.2	111585 0510	89,-
5.2	44	82	6	0.21	111585 0520	89,-
5.3	44	82	6	0.21	111585 0530	89,-
5.4	44	82	6	0.22	111585 0540	89,-
5.5	44	82	6	0.22	111585 0550	89,-
5.6	44	82	6	0.22	111585 0560	89,-
5.7	44	82	6	0.23	111585 0570	89,-
5.8	44	82	6	0.23	111585 0580	89,-
5.9	44	82	6	0.24	111585 0590	89,-
6	44	82	6	0.24	111585 0600	89,-
6.1	53	91	8	0.24	111585 0610	112,-
6.2	53	91	8	0.25	111585 0620	112,-
6.3	53	91	8	0.25	111585 0630	112,-
6.4	53	91	8	0.26	111585 0640	112,-
6.5	53	91	8	0.26	111585 0650	112,-
6.6	53	91	8	0.26	111585 0660	112,-
6.7	53	91	8	0.27	111585 0670	112,-
6.8	53	91	8	0.27	111585 0680	112,-
6.9	53	91	8	0.28	111585 0690	112,-
7	53	91	8	0.28	111585 0700	112,-
7.1	53	91	8	0.28	111585 0710	112,-

D mm	L1 mm	L mm	D1 h6 mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
7.2	53	91	8	0.29	111585 0720	112,-
7.3	53	91	8	0.29	111585 0730	112,-
7.4	53	91	8	0.3	111585 0740	112,-
7.5	53	91	8	0.3	111585 0750	112,-
7.6	53	91	8	0.3	111585 0760	112,-
7.7	53	91	8	0.31	111585 0770	112,-
7.8	53	91	8	0.31	111585 0780	112,-
7.9	53	91	8	0.32	111585 0790	112,-
8	53	91	8	0.32	111585 0800	112,-
8.1	61	103	10	0.32	111585 0810	140,50
8.2	61	103	10	0.33	111585 0820	140,50
8.3	61	103	10	0.33	111585 0830	140,50
8.4	61	103	10	0.34	111585 0840	140,50
8.5	61	103	10	0.34	111585 0850	140,50
8.6	61	103	10	0.34	111585 0860	140,50
8.7	61	103	10	0.35	111585 0870	140,50
8.8	61	103	10	0.35	111585 0880	140,50
8.9	61	103	10	0.36	111585 0890	140,50
9	61	103	10	0.36	111585 0900	140,50
9.1	61	103	10	0.36	111585 0910	140,50
9.2	61	103	10	0.37	111585 0920	140,50
9.3	61	103	10	0.37	111585 0930	140,50
9.4	61	103	10	0.38	111585 0940	140,50
9.5	61	103	10	0.38	111585 0950	140,50
9.6	61	103	10	0.38	111585 0960	140,50
9.7	61	103	10	0.39	111585 0970	140,50
9.8	61	103	10	0.39	111585 0980	140,50
9.9	61	103	10	0.4	111585 0990	140,50
10	61	103	10	0.4	111585 1000	140,50
10.1	71	118	12	0.4	111585 1010	199,50
10.2	71	118	12	0.4	111585 1020	199,50
10.3	71	118	12	0.41	111585 1030	199,50
10.4	71	118	12	0.42	111585 1040	199,50
10.5	71	118	12	0.42	111585 1050	199,50
10.6	71	118	12	0.42	111585 1060	199,50
10.7	71	118	12	0.43	111585 1070	199,50
10.8	71	118	12	0.43	111585 1080	199,50
10.9	71	118	12	0.44	111585 1090	199,50
11	71	118	12	0.44	111585 1100	199,50
11.1	71	118	12	0.44	111585 1110	199,50
11.2	71	118	12	0.45	111585 1120	199,50
11.3	71	118	12	0.45	111585 1130	199,50

1154

1154  
Continued on next page >>>

D mm	L1 mm	L mm	D1 h6 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
11.4	71	118	12	0.46	111585 1140	199,50
11.5	71	118	12	0.46	111585 1150	199,50
11.6	71	118	12	0.46	111585 1160	199,50
11.7	71	118	12	0.47	111585 1170	199,50
11.8	71	118	12	0.47	111585 1180	199,50
11.9	71	118	12	0.48	111585 1190	199,50
12	71	118	12	0.48	111585 1200	199,50
12.2	77	124	14	0.49	111585 1220	263,-
12.5	77	124	14	0.5	111585 1250	263,-
12.8	77	124	14	0.51	111585 1280	263,-
13	77	124	14	0.52	111585 1300	263,-
13.2	77	124	14	0.53	111585 1320	263,-
13.5	77	124	14	0.54	111585 1350	263,-
13.8	77	124	14	0.55	111585 1380	263,-
14	77	124	14	0.56	111585 1400	263,-
14.2	83	133	16	0.57	111585 1420	325,-
14.5	83	133	16	0.58	111585 1450	325,-
14.8	83	133	16	0.59	111585 1480	325,-
15	83	133	16	0.6	111585 1500	325,-
15.1	83	133	16	0.6	111585 1510	325,-
15.2	83	133	16	0.61	111585 1520	325,-

1154

D mm	L1 mm	L mm	D1 h6 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
15.5	83	133	16	0.62	111585 1550	325,-
15.8	83	133	16	0.63	111585 1580	325,-
16	83	133	16	0.64	111585 1600	325,-
16.2	93	143	18	0.65	111585 1620	445,-
16.5	93	143	18	0.66	111585 1650	445,-
16.8	93	143	18	0.67	111585 1680	445,-
17	93	143	18	0.68	111585 1700	445,-
17.2	93	143	18	0.69	111585 1720	445,-
17.5	93	143	18	0.7	111585 1750	445,-
17.8	93	143	18	0.71	111585 1780	445,-
18	93	143	18	0.72	111585 1800	445,-
18.2	101	153	20	0.73	111585 1820	559,-
18.5	101	153	20	0.74	111585 1850	559,-
18.8	101	153	20	0.75	111585 1880	559,-
19	101	153	20	0.76	111585 1900	559,-
19.2	101	153	20	0.77	111585 1920	559,-
19.5	101	153	20	0.78	111585 1950	559,-
19.8	101	153	20	0.79	111585 1980	559,-
20	101	153	20	0.8	111585 2000	559,-

1154

### ATORN® Solid carbide drill, 3-edged

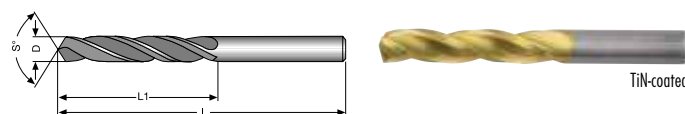
VHM
DIN 6539
Typ N
150°
28°
5xD
Z 3
TiN
i Vc/fz 380

- 3 cutting edges, with wider flutes
- **For precisely positioned and shaped bores in solid material**
- Very good self-centring
- Very good bore surfaces

3 cutting edges

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		●	●	●	○			●	●	○		●	●						
		90-100	50-100	35-70	40			100-140	90-100	18		170-200	140						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	TiN art.no.	€
3	46	22	0.08	111014 0030	36,60
3.2	49	24	0.08	111014 0032	36,60
3.3	49	24	0.08	111014 0033	36,60
3.5	52	27	0.08	111014 0035	36,60
3.8	55	30	0.08	111014 0038	36,60
4	55	30	0.10	111014 0040	36,60
4.2	55	30	0.10	111014 0042	42,-
4.5	58	32	0.10	111014 0045	42,-
4.8	62	35	0.10	111014 0048	42,-
5	62	35	0.10	111014 0050	42,-
5.5	66	39	0.10	111014 0055	51,40
5.8	66	39	0.10	111014 0058	51,40
6	66	39	0.10	111014 0060	51,40
6.5	70	42	0.13	111014 0065	67,20
6.8	74	45	0.13	111014 0068	67,20
7	74	45	0.13	111014 0070	67,20

1154

D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	TiN art.no.	€
7.5	74	45	0.13	111014 0075	78,90
7.8	79	48	0.13	111014 0078	78,90
8	79	48	0.16	111014 0080	78,90
8.5	79	48	0.16	111014 0085	74,80
9	84	52	0.16	111014 0090	74,80
9.5	84	52	0.16	111014 0095	93,10
9.8	89	55	0.16	111014 0098	93,10
10	89	55	0.20	111014 0100	93,10
10.2	89	55	0.20	111014 0102	97,70
10.5	89	55	0.20	111014 0105	99,20
11	95	60	0.20	111014 0110	108,-
12	102	65	0.20	111014 0120	120,50
13	102	65	0.20	111014 0130	137,50
14	107	66	0.20	111014 0140	187,50
15	111	70	0.20	111014 0150	209,-
16	115	73	0.25	111014 0160	280,-

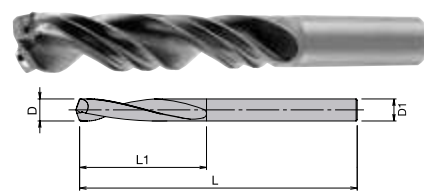
1154

## ATORN® Solid carbide drill reamers

VHM Werks-norm Typ N 140° 30° 5xD DIN 6535 HA Z 2 TiAlN Vc/fz 380

Drilling and reaming in one work step

- Drilling and reaming in one operation
- Reduced machining and auxiliary processing times
- Production of bores in **tolerance zone H7**
- 2 boring inserts and 4 reaming inserts for high surface quality, dimensional stability and true-running accuracy



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium	copper	graphite	hardened steel		
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		65	50	30				50	50								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D H7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
3.98	6	74	36	0.14	111701 0398	129,-
3.99	6	74	36	0.14	111701 0399	129,-
4	6	74	36	0.14	111701 0400	129,-
4.01	6	74	36	0.14	111701 0401	129,-
4.02	6	74	36	0.14	111701 0402	129,-
4.98	6	82	44	0.17	111701 0498	129,-
4.99	6	82	44	0.17	111701 0499	129,-
5	6	82	44	0.17	111701 0500	129,-
5.01	6	82	44	0.17	111701 0501	129,-
5.02	6	82	44	0.17	111701 0502	129,-
5.98	6	91	53	0.19	111701 0598	129,-
5.99	6	91	53	0.19	111701 0599	129,-
6	6	91	53	0.19	111701 0600	129,-
6.01	6	91	53	0.19	111701 0601	129,-
6.02	6	91	53	0.19	111701 0602	129,-
7.98	8	91	53	0.23	111701 0798	129,-
7.99	8	91	53	0.23	111701 0799	129,-

1154

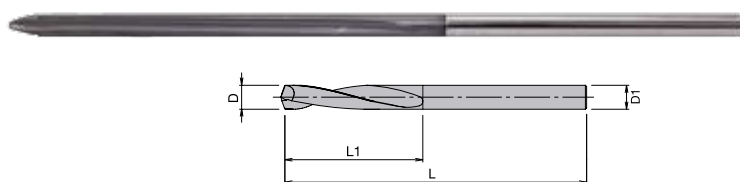
D H7 mm	D1 mm	L mm	L1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
8	8	91	53	0.23	111701 0800	129,-
8.01	8	91	53	0.23	111701 0801	129,-
8.02	8	91	53	0.23	111701 0802	129,-
9.98	10	103	61	0.28	111701 0998	182,50
9.99	10	103	61	0.28	111701 0999	182,50
10	10	103	61	0.28	111701 1000	182,50
10.01	10	103	61	0.28	111701 1001	182,50
10.02	10	103	61	0.28	111701 1002	182,50
11.98	12	118	71	0.32	111701 1198	260,-
11.99	12	118	71	0.32	111701 1199	260,-
12	12	118	71	0.32	111701 1200	260,-
12.01	12	118	71	0.32	111701 1201	260,-
12.02	12	118	71	0.32	111701 1202	260,-
14	14	124	77	0.35	111701 1400	335,-
16	16	133	83	0.35	111701 1600	435,-
18	18	143	93	0.35	111701 1800	509,-
20	20	153	101	0.35	111701 2000	599,-

1154

## ATORN® Solid carbide drill reamer for fibrous materials

VHM Werks-norm 2xD Z 3 DLC Vc/fz 374

- 3 cutting edges
- Cutting material: solid carbide, DLC-coated
- For non-delamination boring of fibrous materials
- Special geometry



material	● very well suited ○ well suited	aluminium		copper	plastics			timber materials	honeycomb sandwich	AFRP	GFRP /CFRP		graphite
		< 8 % Si	≥ 8 % Si	Cu-alloy	thermoplastics	elastomers	duroplasts			aramid	< 30 % fibre content	≥ 30 % fibre content	
											60-100	60-100	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D h6 mm	D1 h6 mm	L mm	L1 mm	Feed f graphite mm/rev	art.no.	€
2	2	100	50	0.02	111815 0200	43,20
2.48	2.48	100	50	0.02	111815 0248	43,20
3	3	100	50	0.03	111815 0300	43,20
3.17	3.17	100	50	0.03	111815 0317	48,20
4	4	100	50	0.04	111815 0400	50,20
4.21	4.21	100	50	0.04	111815 0421	54,50
4.82	4.82	100	50	0.04	111815 0482	58,50
5.05	5.05	100	50	0.05	111815 0505	60,10
5.53	5.53	100	50	0.05	111815 0553	60,10

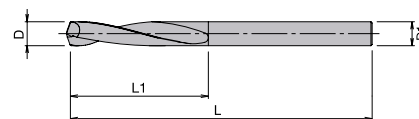
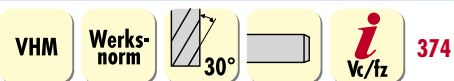
1176

D h6 mm	D1 h6 mm	L mm	L1 mm	Feed f graphite mm/rev	art.no.	€
6	6	100	50	0.06	111815 0600	64,60
6.35	6.35	100	50	0.06	111815 0635	68,70
7	7	100	50	0.07	111815 0700	75,80
7.92	7.92	100	50	0.07	111815 0792	86,50
8	8	100	50	0.08	111815 0800	86,50
8.63	8.63	100	50	0.08	111815 0863	99,20
9	9	100	50	0.09	111815 0900	106,-
10	10	100	50	0.10	111815 1000	116,-
12	12	100	50	0.12	111815 1200	155,-

1176



## ATORN® Solid carbide twist drill bit for fibrous materials



- Special 'sickle-shaped' grinding
- For fibrous materials (aramid)
- No delamination with textile structures
- Polished surface
- Other dimensions available on request

material	● very well suited	aluminium		copper	thermoplastics	plastics	duroplasts	timber	honeycomb	AFRP	GFRP /CFRP		graphite
	○ well suited	< 8 % Si	≥ 8 % Si	Cu-alloy		elastomers		materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
					●				●	●			
					120-130				120	110			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

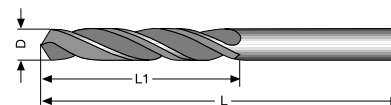
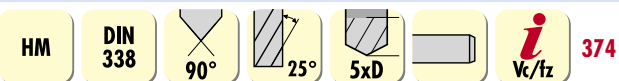
D h6 mm	D1 h6 mm	L mm	L1 mm	Feed f graphite mm/rev	art.no.	€
3	3	45	16	0.04	111810 0300	21,70
4	4	55	18	0.05	111810 0400	33,80
5	5	60	26	0.06	111810 0500	34,90
6	6	66	28	0.07	111810 0600	40,50

1176

D h6 mm	D1 h6 mm	L mm	L1 mm	Feed f graphite mm/rev	art.no.	€
8	8	80	38	0.07	111810 0800	51,40
10	10	90	50	0.08	111810 1000	69,70
12	12	100	50	0.09	111810 1200	94,60

1176

## ATORN® Twist drill bit with solid carbide cutting insert for fibrous materials



- Specially for fibre plastics
- Point angle 90°
- Self-centring 4-surface grinding
- Blank surface
- HSS shank

material	● very well suited	aluminium		copper	thermoplastics	plastics	duroplasts	timber	honeycomb	AFRP	GFRP /CFRP		graphite
	○ well suited	< 8 % Si	≥ 8 % Si	Cu-alloy		elastomers		materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
		○									●	●	
		50									100-200	100-150	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

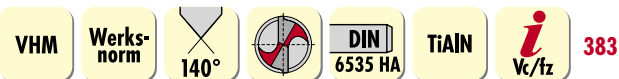
D h7 mm	L mm	L1 mm	Feed f graphite mm/rev	art.no.	€
2.4	57	30	0.03	111805 0240	14,55
2.5	57	30	0.03	111805 0250	12,20
3	61	33	0.03	111805 0300	12,35
3.5	70	39	0.03	111805 0350	12,50
4	75	43	0.04	111805 0400	12,70
4.1	75	43	0.04	111805 0410	14,75
4.2	75	43	0.04	111805 0420	14,75
4.5	80	47	0.04	111805 0450	12,95
4.9	86	52	0.04	111805 0490	14,90
5	86	52	0.05	111805 0500	13,15
5.1	86	52	0.05	111805 0510	16,-
5.5	93	57	0.05	111805 0550	14,15
5.7	93	57	0.05	111805 0570	16,80
5.8	93	57	0.05	111805 0580	16,80
6	93	57	0.06	111805 0600	14,50
6.1	101	63	0.06	111805 0610	16,10
6.5	101	63	0.06	111805 0650	16,70
6.6	109	69	0.06	111805 0660	19,25
6.8	109	69	0.06	111805 0680	19,25
7	109	69	0.07	111805 0700	16,70

1176

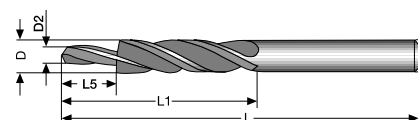
D h7 mm	L mm	L1 mm	Feed f graphite mm/rev	art.no.	€
7.5	109	69	0.07	111805 0750	18,25
8	117	75	0.08	111805 0800	19,45
8.2	117	75	0.08	111805 0820	23,50
8.5	117	75	0.08	111805 0850	21,10
9	125	81	0.09	111805 0900	21,30
9.4	125	81	0.09	111805 0940	25,50
9.5	125	81	0.09	111805 0950	23,30
9.9	133	87	0.09	111805 0990	25,50
10	133	87	0.10	111805 1000	23,30
10.5	133	87	0.10	111805 1050	23,30
11	142	94	0.11	111805 1100	28,10
11.5	142	94	0.11	111805 1150	34,20
12	151	101	0.12	111805 1200	34,20
12.2	151	101	0.12	111805 1220	39,-
12.5	151	101	0.12	111805 1250	39,-
13	151	101	0.13	111805 1300	39,-
13.5	160	108	0.13	111805 1350	52,90
14	160	108	0.14	111805 1400	52,90
15	169	114	0.15	111805 1500	60,10
16	178	120	0.16	111805 1600	69,20

1176

## ATORN® Solid carbide short step drill bit



- Ø tolerance h8
- **Cutting material: solid carbide, TiAlN-coated**
- For economical bore and countersink production in one operation
- Tight concentricity tolerance for precise alignment
- **Especially suitable for NC machines and automatic units**
- **Note:** The cutting speed is determined by the large diameter, while the feed rate is determined by the small diameter



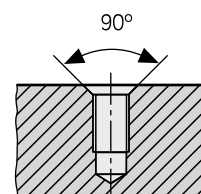
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc
		75	60	60	25	30	25	70	60	35	35	200	180	80			25		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### 90°

- **For core drilling**
- Step length in accordance with DIN 8378
- **For DIN-ISO 273 screw through-holes and DIN 74-1 countersinks, ISO 2009-2010 and DIN 963-966 countersunk screws**

for thread	D h8 mm	D2 h8 mm	D1 mm	L5 mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	90° countersink angle art.no.	€
M 3	6	2.5	6	8.8	28	66	0.10	102202 0003	55,50
M 4	6	3.3	6	11.4	28	66	0.10	102202 0004	55,50
M 5	6	4.2	6	13.6	28	66	0.10	102202 0005	55,50
M 6	8	5	8	16.5	41	79	0.10	102202 0006	86,-
M 8	10	6.8	10	21	47	89	0.12	102202 0008	121,50
M 10	12	8.5	12	25.5	55	102	0.15	102202 0010	165,-
M 12	14	10.2	14	30	60	107	0.15	102202 0012	209,-

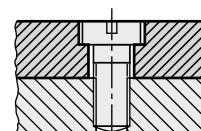


1154

### 180°

- **For through-holes**
- Step length in accordance with DIN 8376
- **For screw through-holes in accordance with DIN-ISO 273 and countersinks in accordance with DIN 74 Part 2, Type H, J and K, medium version; for screws in accordance with DIN 912, 6912 and 7984, ISO 1207 (DIN 84)**

for thread	D h8 mm	D2 h8 mm	D1 mm	L5 mm	L1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	180° countersink angle art.no.	€
M 3	6	3.4	6	9	28	64	0.10	102211 0003	57,80
M 4	8	4.5	8	11	37	79	0.10	102211 0004	88,50
M 5	10	5.5	10	13	43	89	0.11	102211 0005	122,50
M 6	11	6.6	12	15	55	102	0.11	102211 0006	166,50
M 8	15	9	16	19	60	115	0.14	102211 0008	284,-
M 10	18	11	18	23	62	123	0.14	102211 0010	341,-



1154










Radial run-out ...

... 3 µm

**ATORN®**  
Performance demands quality

## Overview of modular drilling tools

	Factory standard						
Sorting by type and diameter							
Brand	<b>ATORN®</b>	<b>ATORN®</b>	<b>palbit</b>	<b>ATORN®</b>	<b>PXD</b>	<b>T-A Pro</b>	<b>T-A® Original GEN2 T-A®</b>
System	NC	NC	CHT	ETD 840	PXD	T-A Pro	T-A® Original GEN2 T-A®
ISO	<b>P M K</b>	<b>P M K</b>	<b>P M K</b>	<b>P M K S N H</b>	<b>P M K N</b>	<b>P M K S N H</b>	<b>P M K S N H</b>
Type/info	90°	120°	NC spotting				
Drilling depth				3 x D, 7 x D, 10 x D	3 and 5 x D	to 15 x D	to 32 x D
Diameter [mm]	0,8 - 17	0,8 - 21	13	8 - 40	14 - 25,4	11,5 - 47,5	9,5 - 114
Shank	Straight	Straight	Straight	Straight	Straight	Straight	Straight / MK
Cutting material	HM	HM	HM	HM	Solid carbide	HM	HSS-E / HM
Coating	HC4630	HC4630	PH7920	TiAlN	XP3425/1425, CF225	AM300, TiAlN, TiCN	AM 200 / 300™
<b>Page</b>	<b>175</b>	<b>175</b>	<b>175</b>	<b>176</b>	<b>181</b>	<b>184</b>	<b>189</b>

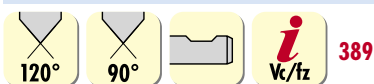
	Factory standard						
Sorting by type and diameter							
Brand	<b>PXD</b>	<b>palbit</b>	<b>palbit</b>	<b>palbit</b>	<b>palbit</b>	<b>palbit</b>	<b>palbit</b>
System	Phoenix PD	SCS	SCC	Spot Face	TDS	TDC	Vortex Drill
ISO	<b>P M K S N H</b>	<b>P M K S N</b>	<b>P M K S N</b>	<b>P M K S N</b>	<b>P M K S N</b>	<b>P M K S N</b>	<b>P M K N</b>
Type/info	XCMT	SPKX	SPKX	SPKX	WCKX	WCKX	WCKX
Drilling depth	2, 3, 4 and 5 x D	3 and 4 x D	3 and 4 x D		3 x D	3 x D	10 x D
Diameter [mm]	15 - 63	13 - 50	50 - 80	10 - 25	13 - 58	59 - 80	45 - 180
Shank	Straight	Straight	Straight	Straight	Straight	Straight	Straight
Cutting material	HM	HM	HM	HM	HM	HM	HM
Coating	XP / CK	PH6920/6930	PH6920/6930	PH6920/6930	PH6920/6930	PH6920/6930	PH6920/6930
<b>Page</b>	<b>200</b>	<b>206</b>	<b>208</b>	<b>209</b>	<b>210</b>	<b>211</b>	<b>212</b>

	Factory standard						
Sorting by type and diameter							
Brand	<b>SARA®</b>	<b>ATORN®</b>	<b>SARA®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>
System	SARADRILL	UNI 5 in 1	SARACut 2.0	Precision boring bar	Core and countersink drill	Solid measure core drill	Reverse countersink 45°/180°
ISO	<b>P M K N H</b>	<b>P M K S N</b>	<b>P M K S N</b>	<b>P M K S N</b>	<b>P M K S N</b>	<b>P M K S N</b>	<b>P M K S N</b>
Type/info		WCHX	XPNT, XPET	CCMT	CCMT	CCMT	TCMT
Drilling depth	to 15 x D	1,5 and 2,25 x D	1,5 and 2,5 x D	2,5 x D			
Diameter	49 - 270	8 - 26	8 - 32	10 - 32	16 - 48	9,8 - 31,8	15 - 76
Shank	MK	Straight	Straight	Straight	Straight	Straight	Straight
Cutting material	HSS-E-PM	HM	HM	HM	HM	HM	HM
Coating	(TiN)	HW7310, HC7625/7535		ICI-dependent	ICI-dependent	ICI-dependent	ICI-dependent
<b>Page</b>	<b>216</b>	<b>219</b>	<b>220</b>	<b>221</b>	<b>222</b>	<b>223</b>	<b>223</b>

## ATORN® Multifunction tool for indexable cutting inserts

4 effective cutting edges per indexable insert

NEW



- Surface-hardened carrier tool
- **For centring, NC drilling, milling and V-groove milling**
- Cost-efficient thanks to 4 useable cutting edges per indexable insert
- **Improved process reliability due to the special installation position of the SEEX**
- Tightening torque for clamping screw M4 = 5.2 Nm

### individual

Designation	D min. mm	D max. mm	L mm	L1 mm	D1 mm	Number of index. inserts	suitable indexable inserts	A1	B1	art.no.	€
AFZ 120°	0.8	21	120	40	16	1	SEEX 12T408	A1	B1	100810 0060	148,-
AFZ 90°	0.8	17	120	40	16	1	SEEX 12T408	A1	B1	100810 0090	148,-
1132											

### Sets

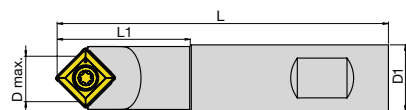
Designation	Contents	A1	B1	art.no.	€
AFZ 120° SET	Multifunction tool incl. 5 indexable inserts	A1	B1	100811 0060	239,-
AFZ 90° SET	Multifunction tool incl. 5 indexable inserts	A1	B1	100811 0090	239,-
1132					

### Indexable cutting inserts

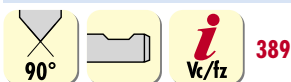
ISO designation	art.no.	€
SEEX 12T408	10 100815 1208	19,75
2126		

### Spare parts

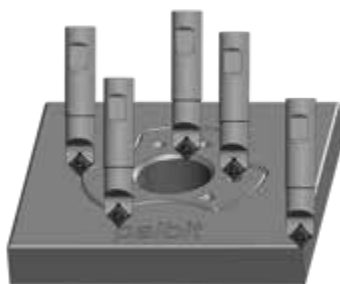
Screw			Steel grey		
art.no.	€		art.no.	€	
A1 100890 0415	11,15	3106	B1 703038 0150	2,29	7111



## palbit® Indexable inserts NC spotting drill bit CHT



- Surface-hardened carrier tool
- **for NC spot drilling and chamfering**
- **Suitable indexable cutting inserts:**  
SOMT 11T308 for universal applications  
SOGT 11T303 for engraving



Centring, chamfering, engraving



100800 1310



100800 1315

### Single

Designation	D max. mm	t max. mm	D1 mm	L mm	Number of index. inserts	suitable indexable inserts	A1	B1	art.no.	€
CHT S16H N11-45	13	6.5	16	100	1	S.MT 11T3..	A1	B1	100800 1310	122,50
CHT S16M N11-45	13	6.5	16	150	1	S.MT 11T3..	A1	B1	100800 1315	155,50
2174										



### Sets

Designation	Contents	A1	B1	art.no.	€
PK SOMT 11T308 CHTS16H	Indexable inserts centre drill bits L = 100 mm incl. 10 x SOMT 11T308	A1	B1	100801 1310	250,-
PK SOMT 11T308 CHTS16M	Indexable inserts centre drill bits L = 150 mm incl. 10 x SOMT 11T308	A1	B1	100801 1315	282,-
2174					

NC spotting drill bit incl. 10 indexable cutting inserts

### Indexable cutting inserts

ISO designation	art.no.	€
SOMT 11T308 (UNI)	10 100802 1108	20,70
SOGT 110303 (GR)	10 100802 1103	22,30
2170		



SOMT 11T309

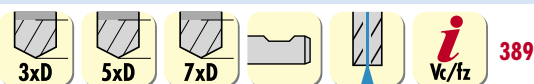


SOGT 11T304

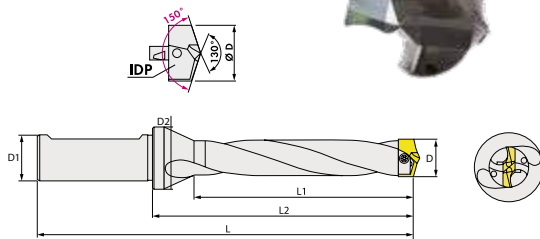
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 321099 0009	4,34	3160	B1 703053 0150	1,93	7114

## ATORN® ETD 840 indexable insert drill bit








- Drilling in the 8.0 - 40.0 mm diameter range
- Innovative cutting edge geometry
- Up to 10xD and Ø 50 mm available on request
- Made from high-strength, heat-resistant powdered metal
- Polished chip chambers for low-vibration, reliable chip removal
- **Indexable inserts available from the manufacturer in 0.1 mm diameter increments**
- High bore surface quality and precision
- **Coated bodies for increased wear-resistance available on request**



### 3xD






D mm	D1 h6 mm	D2 mm	L mm	L1 mm	L2 mm	[Icons]			art.no.	€	
8.0 - 8.4	10 (HA)	18	87	32	42		B1	E1	106003 0080	199,50	
8.5 - 8.9	10 (HA)	18	89	34	44		B1	E1	106003 0085	199,50	
9.0 - 9.4	10 (HA)	18	92	36	47		B2	E1	106003 0090	199,50	
9.5 - 9.9	12 (HA)	18	97	38	49		B2	E1	106003 0095	199,50	
10.0 - 10.4	12 (HA)	18	99	40	51		B3	E1	106003 0100	199,50	
10.5 - 10.9	12 (HA)	18	102	42	54		B3	E1	106003 0105	199,50	
11.0 - 11.4	12 (HA)	18	104	44	56		B3	E1	106003 0110	199,50	
11.5 - 11.9	12 (HA)	18	107	46	59		B3	E1	106003 0115	199,50	
12.0 - 12.4	16 (HB)	21	109	48	61	A1	B4	C1	E1	106003 0120	202,-
12.5 - 12.9	16 (HB)	21	111	50	63	A1	B4	C1	E1	106003 0125	202,-
13.0 - 13.4	16 (HB)	21	114	52	66	A1	B4	C1	E1	106003 0130	202,-
13.5 - 13.9	16 (HB)	21	116	54	68	A1	B4	C1	E1	106003 0135	202,-
14.0 - 14.4	16 (HB)	21	119	56	71	A1	B5	D1	E2	106003 0140	216,-
14.5 - 14.9	20 (HB)	27	123	58	73	A1	B5	D1	E2	106003 0145	216,-
15.0 - 15.4	20 (HB)	27	127	60	77	A1	B5	D1	E2	106003 0150	216,-
15.5 - 15.9	20 (HB)	27	130	62	80	A1	B5	D1	E2	106003 0155	216,-
16.0 - 16.4	20 (HB)	27	132	64	82	A1	B6	D1	E2	106003 0160	216,-
16.5 - 16.9	20 (HB)	27	135	66	85	A1	B6	D1	E2	106003 0165	216,-
17.0 - 17.4	20 (HB)	27	137	68	87	A1	B6	D1	E2	106003 0170	216,-
17.5 - 17.9	20 (HB)	27	139	70	89	A1	B6	D1	E2	106003 0175	216,-
18.0 - 18.4	20 (HB)	27	142	72	92	A1	B7	D1	E3	106003 0180	216,-
18.5 - 18.9	20 (HB)	27	144	74	94	A1	B7	D1	E3	106003 0185	216,-
19.0 - 19.4	20 (HB)	27	147	76	97	A1	B7	D1	E3	106003 0190	216,-
19.5 - 19.9	20 (HB)	27	149	78	99	A1	B7	D1	E3	106003 0195	216,-
20.0 - 20.4	25 (HB)	32	157	80	101	A2	B8	D2	E3	106003 0200	261,-
20.5 - 20.9	25 (HB)	32	160	82	104	A2	B8	D2	E3	106003 0205	261,-
21.0 - 21.4	25 (HB)	32	162	84	106	A2	B8	D2	E3	106003 0210	261,-
21.5 - 21.9	25 (HB)	32	165	86	109	A2	B8	D2	E3	106003 0215	261,-
22.0 - 22.4	25 (HB)	32	167	88	111	A2	B9	D2	E3	106003 0220	261,-
22.5 - 22.9	25 (HB)	32	169	90	113	A2	B9	D2	E3	106003 0225	261,-
23.0 - 23.4	25 (HB)	32	172	92	116	A2	B9	D2	E3	106003 0230	261,-
23.5 - 23.9	25 (HB)	32	174	94	118	A2	B9	D2	E3	106003 0235	261,-
24.0 - 24.4	32 (HB)	39	181	96	121	A2	B10	D2	E4	106003 0240	322,-
24.5 - 24.9	32 (HB)	39	183	98	123	A2	B10	D2	E4	106003 0245	322,-
25.0 - 25.4	32 (HB)	39	185	100	125	A2	B10	D2	E4	106003 0250	322,-
25.5 - 25.9	32 (HB)	39	188	102	128	A2	B10	D2	E4	106003 0255	322,-
26.0 - 26.4	32 (HB)	39	190	104	130	A2	B11	D2	E4	106003 0260	322,-
26.5 - 26.9	32 (HB)	39	193	106	133	A2	B11	D2	E4	106003 0265	322,-
27.0 - 27.4	32 (HB)	39	195	108	135	A3	B11	D3	E4	106003 0270	322,-
27.5 - 27.9	32 (HB)	39	197	110	137	A3	B11	D3	E4	106003 0275	322,-
28.0 - 28.4	32 (HB)	39	200	112	140	A3	B12	D3	E4	106003 0280	420,-
28.5 - 28.9	32 (HB)	39	202	114	142	A3	B12	D3	E4	106003 0285	420,-
29.0 - 29.4	32 (HB)	39	205	116	145	A3	B12	D3	E4	106003 0290	420,-
29.5 - 29.9	32 (HB)	39	207	118	147	A3	B12	D3	E4	106003 0295	420,-
30.0 - 30.4	32 (HB)	39	209	120	149	A3	B13	D3	E5	106003 0300	420,-
30.5 - 30.9	32 (HB)	39	212	122	152	A3	B13	D3	E5	106003 0305	420,-
31.0 - 31.4	32 (HB)	39	214	124	154	A4	B13	D4	E5	106003 0310	420,-

D mm	D1 h6 mm	D2 mm	L mm	L1 mm	L2 mm						art.no.	€
31.5 - 31.9	32 (HB)	39	217	126	157	A4	B13		D4	E5	106003 0315	420,-
32.0 - 32.4	32 (HB)	39	219	128	159	A4	B14		D4	E5	106003 0320	499,-
32.5 - 32.9	32 (HB)	39	221	130	161	A4	B14		D4	E5	106003 0325	499,-
33.0 - 33.4	32 (HB)	39	224	132	164	A4	B14		D4	E5	106003 0330	499,-
33.5 - 33.9	32 (HB)	39	226	134	166	A4	B14		D4	E5	106003 0335	499,-
34.0 - 34.4	40 (HB)	55	239	136	169	A4	B14		D4	E5	106003 0340	549,-
34.5 - 34.9	40 (HB)	55	241	138	171	A4	B14		D4	E5	106003 0345	549,-
35.0 - 35.4	40 (HB)	55	243	140	173	A4	B14		D4	E5	106003 0350	549,-
35.5 - 35.9	40 (HB)	55	246	142	176	A4	B14		D4	E5	106003 0355	549,-
36.0 - 36.4	40 (HB)	55	248	144	178	A4	B15		D4	E5	106003 0360	569,-
36.5 - 36.9	40 (HB)	55	251	146	181	A4	B15		D4	E5	106003 0365	569,-
37.0 - 37.4	40 (HB)	55	253	148	183	A4	B15		D4	E5	106003 0370	569,-
37.5 - 37.9	40 (HB)	55	255	150	185	A4	B15		D4	E5	106003 0375	569,-
38.0 - 38.4	40 (HB)	55	258	152	188	A4	B15		D4	E5	106003 0380	569,-
38.5 - 38.9	40 (HB)	55	260	154	196	A4	B15		D4	E5	106003 0385	569,-
39.0 - 39.4	40 (HB)	55	263	156	193	A4	B15		D4	E5	106003 0390	569,-
39.5 - 39.9	40 (HB)	55	265	158	195	A4	B15		D4	E5	106003 0395	569,-
40.0 - 40.4	40 (HB)	55	267	160	197	A5	B16		D5	E5	106003 0400	609,-

1152







## 5xD

D mm	D1 h6 mm	D2 mm	L mm	L1 mm	L2 mm						art.no.	€
8.0 - 8.4	10 (HA)	18	103	48	58		B1			E1	<b>106005</b> 0080	243,-
8.5 - 8.9	10 (HA)	18	106	51	61		B1			E1	106005 0085	243,-
9.0 - 9.4	10 (HA)	18	110	54	65		B2			E1	106005 0090	243,-
9.5 - 9.9	12 (HA)	18	116	57	68		B2			E1	106005 0095	243,-
10.0 - 10.4	12 (HA)	18	119	60	71		B3			E1	106005 0100	243,-
10.5 - 10.9	12 (HA)	18	123	63	75		B3			E1	106005 0105	243,-
11.0 - 11.4	12 (HA)	18	126	66	78		B3			E1	106005 0110	243,-
11.5 - 11.9	12 (HA)	18	130	69	82		B3			E1	106005 0115	243,-
12.0 - 12.4	16 (HB)	21	133	72	85	A1	B4	C1		E1	106005 0120	261,-
12.5 - 12.9	16 (HB)	21	136	75	88	A1	B4	C1		E1	106005 0125	261,-
13.0 - 13.4	16 (HB)	21	140	78	92	A1	B4	C1		E1	106005 0130	261,-
13.5 - 13.9	16 (HB)	21	143	81	95	A1	B4	C1		E1	106005 0135	261,-
14.0 - 14.4	16 (HB)	21	147	84	99	A1	B5		D1	E2	106005 0140	291,-
14.5 - 14.9	20 (HB)	27	152	87	102	A1	B5		D1	E2	106005 0145	291,-
15.0 - 15.4	20 (HB)	27	157	90	107	A1	B5		D1	E2	106005 0150	291,-
15.5 - 15.9	20 (HB)	27	161	93	111	A1	B5		D1	E2	106005 0155	291,-
16.0 - 16.4	20 (HB)	27	164	96	114	A1	B6		D1	E2	106005 0160	318,-
16.5 - 16.9	20 (HB)	27	168	99	118	A1	B6		D1	E2	106005 0165	318,-
17.0 - 17.4	20 (HB)	27	171	102	121	A1	B6		D1	E2	106005 0170	318,-
17.5 - 17.9	20 (HB)	27	174	105	124	A1	B6		D1	E2	106005 0175	318,-
18.0 - 18.4	20 (HB)	27	178	108	128	A1	B7		D1	E3	106005 0180	344,-
18.5 - 18.9	20 (HB)	27	181	111	131	A1	B7		D1	E3	106005 0185	344,-
19.0 - 19.4	20 (HB)	27	185	114	135	A1	B7		D1	E3	106005 0190	344,-
19.5 - 19.9	20 (HB)	27	188	117	138	A1	B7		D1	E3	106005 0195	344,-
20.0 - 20.4	25 (HB)	32	197	120	141	A2	B8		D2	E3	106005 0200	344,-
20.5 - 20.9	25 (HB)	32	201	123	145	A2	B8		D2	E3	106005 0205	344,-
21.0 - 21.4	25 (HB)	32	204	126	148	A2	B8		D2	E3	106005 0210	344,-
21.5 - 21.9	25 (HB)	32	208	129	152	A2	B8		D2	E3	106005 0215	344,-
22.0 - 22.4	25 (HB)	32	211	132	155	A2	B9		D2	E3	106005 0220	365,-
22.5 - 22.9	25 (HB)	32	214	135	158	A2	B9		D2	E3	106005 0225	365,-
23.0 - 23.4	25 (HB)	32	218	138	162	A2	B9		D2	E3	106005 0230	365,-
23.5 - 23.9	25 (HB)	32	221	141	165	A2	B9		D2	E3	106005 0235	365,-
24.0 - 24.4	32 (HB)	39	229	144	169	A2	B10		D2	E4	106005 0240	390,-
24.5 - 24.9	32 (HB)	39	232	147	172	A2	B10		D2	E4	106005 0245	390,-
25.0 - 25.4	32 (HB)	39	235	150	175	A2	B10		D2	E4	106005 0250	390,-
25.5 - 25.9	32 (HB)	39	239	153	179	A2	B10		D2	E4	106005 0255	390,-
26.0 - 26.4	32 (HB)	39	242	156	182	A2	B11		D2	E4	106005 0260	435,-

1152





Continued on next page &gt;&gt;&gt;







D mm	D1 h6 mm	D2 mm	L mm	L1 mm	L2 mm						art.no.	€
26.5 - 26.9	32 (HB)	39	246	159	186	A2	B11		D2	E4	106005 0265	435,-
27.0 - 27.4	32 (HB)	39	249	162	189	A3	B11		D3	E4	106005 0270	435,-
27.5 - 27.9	32 (HB)	39	252	165	192	A3	B11		D3	E4	106005 0275	435,-
28.0 - 28.4	32 (HB)	39	256	168	196	A3	B12		D3	E4	106005 0280	435,-
28.5 - 28.9	32 (HB)	39	259	171	199	A3	B12		D3	E4	106005 0285	435,-
29.0 - 29.4	32 (HB)	39	263	174	203	A3	B12		D3	E4	106005 0290	435,-
29.5 - 29.9	32 (HB)	39	266	177	206	A3	B12		D3	E4	106005 0295	435,-
30.0 - 30.4	32 (HB)	39	269	180	209	A3	B13		D3	E5	106005 0300	435,-
30.5 - 30.9	32 (HB)	39	273	183	213	A3	B13		D3	E5	106005 0305	435,-
31.0 - 31.4	32 (HB)	39	276	186	216	A4	B13		D4	E5	106005 0310	435,-
31.5 - 31.9	32 (HB)	39	280	189	220	A4	B13		D4	E5	106005 0315	435,-
32.0 - 32.4	32 (HB)	39	283	192	223	A4	B14		D4	E5	106005 0320	559,-
32.5 - 32.9	32 (HB)	39	286	195	226	A4	B14		D4	E5	106005 0325	559,-
33.0 - 33.4	32 (HB)	39	290	198	230	A4	B14		D4	E5	106005 0330	559,-
33.5 - 33.9	32 (HB)	39	293	201	233	A4	B14		D4	E5	106005 0335	559,-
34.0 - 34.4	40 (HB)	55	307	204	237	A4	B14		D4	E5	106005 0340	699,-
34.5 - 34.9	40 (HB)	55	310	207	240	A4	B14		D4	E5	106005 0345	699,-
35.0 - 35.4	40 (HB)	55	313	210	243	A4	B14		D4	E5	106005 0350	699,-
35.5 - 35.9	40 (HB)	55	317	213	247	A4	B14		D4	E5	106005 0355	699,-
36.0 - 36.4	40 (HB)	55	320	216	250	A4	B15		D4	E5	106005 0360	719,-
36.5 - 36.9	40 (HB)	55	324	219	254	A4	B15		D4	E5	106005 0365	719,-
37.0 - 37.4	40 (HB)	55	327	222	257	A4	B15		D4	E5	106005 0370	719,-
37.5 - 37.9	40 (HB)	55	330	225	260	A4	B15		D4	E5	106005 0375	719,-
38.0 - 38.4	40 (HB)	55	334	228	264	A4	B15		D4	E5	106005 0380	719,-
38.5 - 38.9	40 (HB)	55	337	231	267	A4	B15		D4	E5	106005 0385	719,-
39.0 - 39.4	40 (HB)	55	341	234	271	A4	B15		D4	E5	106005 0390	719,-
39.5 - 39.9	40 (HB)	55	344	237	274	A4	B15		D4	E5	106005 0395	719,-
40.0 - 40.4	40 (HB)	55	347	240	277	A5	B16		D5	E5	106005 0400	759,-

1152

**7xD**






D mm	D1 h6 mm	D2 mm	L mm	L1 mm	L2 mm						art.no.	€
8.0 - 8.4	10 (HA)	18	119	64	74		B1			E1	<b>106007</b> 0080	322,-
8.5 - 8.9	10 (HA)	18	123	68	78		B1			E1	106007 0085	322,-
9.0 - 9.4	10 (HA)	18	128	72	83		B2			E1	106007 0090	322,-
9.5 - 9.9	12 (HA)	18	135	76	87		B2			E1	106007 0095	322,-
10.0 - 10.4	12 (HA)	18	139	80	91		B3			E1	106007 0100	338,-
10.5 - 10.9	12 (HA)	18	144	84	96		B3			E1	106007 0105	338,-
11.0 - 11.4	12 (HA)	18	148	88	100		B3			E1	106007 0110	338,-
11.5 - 11.9	12 (HA)	18	153	92	105		B3			E1	106007 0115	338,-
12.0 - 12.4	16 (HB)	21	157	96	109	A1	B4	C1		E1	106007 0120	380,-
12.5 - 12.9	16 (HB)	21	161	100	113	A1	B4	C1		E1	106007 0125	380,-
13.0 - 13.4	16 (HB)	21	166	104	118	A1	B4	C1		E1	106007 0130	380,-
13.5 - 13.9	16 (HB)	21	170	108	122	A1	B4	C1		E1	106007 0135	380,-
14.0 - 14.4	16 (HB)	21	175	112	127	A1	B5		D1	E2	106007 0140	410,-
14.5 - 14.9	20 (HB)	27	181	116	131	A1	B5		D1	E2	106007 0145	410,-
15.0 - 15.4	20 (HB)	27	187	120	137	A1	B5		D1	E2	106007 0150	410,-
15.5 - 15.9	20 (HB)	27	192	124	142	A1	B5		D1	E2	106007 0155	410,-
16.0 - 16.4	20 (HB)	27	196	128	146	A1	B6		D1	E2	106007 0160	475,-
16.5 - 16.9	20 (HB)	27	201	132	151	A1	B6		D1	E2	106007 0165	475,-
17.0 - 17.4	20 (HB)	27	205	136	155	A1	B6		D1	E2	106007 0170	475,-
17.5 - 17.9	20 (HB)	27	209	140	159	A1	B6		D1	E2	106007 0175	475,-
18.0 - 18.4	20 (HB)	27	214	144	164	A1	B7		D1	E3	106007 0180	470,-
18.5 - 18.9	20 (HB)	27	218	148	168	A1	B7		D1	E3	106007 0185	470,-
19.0 - 19.4	20 (HB)	27	223	152	173	A1	B7		D1	E3	106007 0190	470,-
19.5 - 19.9	20 (HB)	27	227	156	177	A1	B7		D1	E3	106007 0195	470,-
20.0 - 20.4	25 (HB)	32	237	160	181	A2	B8		D2	E3	106007 0200	569,-
20.5 - 20.9	25 (HB)	32	242	164	186	A2	B8		D2	E3	106007 0205	569,-

1152

D mm	D1 h6 mm	D2 mm	L mm	L1 mm	L2 mm					art.no.	€
21.0 - 21.4	25 (HB)	32	246	168	190	A2	B8	D2	E3	106007 0210	569,-
21.5 - 21.9	25 (HB)	32	251	172	195	A2	B8	D2	E3	106007 0215	569,-
22.0 - 22.4	25 (HB)	32	255	176	199	A2	B9	D2	E3	106007 0220	569,-
22.5 - 22.9	25 (HB)	32	259	180	203	A2	B9	D2	E3	106007 0225	569,-
23.0 - 23.4	25 (HB)	32	264	184	208	A2	B9	D2	E3	106007 0230	569,-
23.5 - 23.9	25 (HB)	32	268	188	212	A2	B9	D2	E3	106007 0235	569,-
24.0 - 24.4	32 (HB)	39	277	192	217	A2	B10	D2	E4	106007 0240	649,-
24.5 - 24.9	32 (HB)	39	281	196	221	A2	B10	D2	E4	106007 0245	649,-
25.0 - 25.4	32 (HB)	39	285	200	225	A2	B10	D2	E4	106007 0250	649,-
25.5 - 25.9	32 (HB)	39	290	204	230	A2	B10	D2	E4	106007 0255	649,-
26.0 - 26.4	32 (HB)	39	294	208	234	A2	B11	D2	E4	106007 0260	679,-
26.5 - 26.9	32 (HB)	39	299	212	239	A2	B11	D2	E4	106007 0265	679,-
27.0 - 27.4	32 (HB)	39	303	216	243	A3	B11	D3	E4	106007 0270	679,-
27.5 - 27.9	32 (HB)	39	307	220	247	A3	B11	D3	E4	106007 0275	679,-
28.0 - 28.4	32 (HB)	39	312	224	252	A3	B12	D3	E4	106007 0280	869,-
28.5 - 28.9	32 (HB)	39	316	228	256	A3	B12	D3	E4	106007 0285	869,-
29.0 - 29.4	32 (HB)	39	321	232	261	A3	B12	D3	E4	106007 0290	869,-
29.5 - 29.9	32 (HB)	39	325	236	265	A3	B12	D3	E4	106007 0295	869,-
30.0 - 30.4	32 (HB)	39	329	240	269	A3	B13	D3	E5	106007 0300	869,-
30.5 - 30.9	32 (HB)	39	334	244	274	A3	B13	D3	E5	106007 0305	869,-
31.0 - 31.4	32 (HB)	39	338	248	278	A4	B13	D4	E5	106007 0310	869,-
31.5 - 31.9	32 (HB)	39	343	252	283	A4	B13	D4	E5	106007 0315	869,-
32.0 - 32.4	32 (HB)	39	347	256	287	A4	B14	D4	E5	106007 0320	929,-
32.5 - 32.9	32 (HB)	39	351	260	291	A4	B14	D4	E5	106007 0325	929,-
33.0 - 33.4	32 (HB)	39	356	264	296	A4	B14	D4	E5	106007 0330	929,-
33.5 - 33.9	32 (HB)	39	360	268	300	A4	B14	D4	E5	106007 0335	929,-
34.0 - 34.4	40 (HB)	55	375	272	305	A4	B14	D4	E5	106007 0340	999,-
34.5 - 34.9	40 (HB)	55	379	276	309	A4	B14	D4	E5	106007 0345	999,-
35.0 - 35.4	40 (HB)	55	383	280	313	A4	B14	D4	E5	106007 0350	999,-
35.5 - 35.9	40 (HB)	55	388	284	318	A4	B14	D4	E5	106007 0355	999,-
36.0 - 36.4	40 (HB)	55	392	288	322	A4	B15	D4	E5	106007 0360	1.449,-
36.5 - 36.9	40 (HB)	55	397	292	327	A4	B15	D4	E5	106007 0365	1.449,-
37.0 - 37.4	40 (HB)	55	401	296	331	A4	B15	D4	E5	106007 0370	1.449,-
37.5 - 37.9	40 (HB)	55	405	300	335	A4	B15	D4	E5	106007 0375	1.449,-
38.0 - 38.4	40 (HB)	55	410	304	340	A4	B15	D4	E5	106007 0380	1.449,-
38.5 - 38.9	40 (HB)	55	414	308	344	A4	B15	D4	E5	106007 0385	1.449,-
39.0 - 39.4	40 (HB)	55	419	312	349	A4	B15	D4	E5	106007 0390	1.449,-
39.5 - 39.9	40 (HB)	55	423	316	353	A4	B15	D4	E5	106007 0395	1.449,-
40.0 - 40.4	40 (HB)	55	427	320	357	A5	B16	D5	E5	106007 0400	1.529,-

1152

Spare parts

	Clamping screw			Through bolt			Black, oiled			Nickel-plated			TORX	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	106025 0020	6,15	B1	106027 0800	9,40	C1	703001 0009	0,52	D1	703005 0013	0,39	E1	703053 0060	1,93
A2	106025 0030	6,15	B2	106027 0900	9,40				D2	703005 0015	0,39	E2	703053 0070	1,93
A3	106025 0040	6,15	B3	106027 1000	9,40				D3	703005 0020	0,39	E3	703053 0080	1,93
A4	106025 0050	6,15	B4	106027 1200	9,40				D4	703005 0025	0,39	E4	703053 0150	1,93
A5	106025 0060	6,15	B5	106027 1400	9,40				D5	703005 0030	0,39	E5	703053 0200	1,93
			B6	106027 1600	9,40									
			B7	106027 1800	9,40									
			B8	106027 2000	9,40									
			B9	106027 2200	9,40									
			B10	106027 2400	9,40									
			B11	106027 2600	9,40									
			B12	106027 2800	9,40									
			B13	106027 3000	9,40									
			B14	106027 3200	9,40									
			B15	106027 3600	9,40									
			B16	106027 4000	9,40									

1152

1152

7111

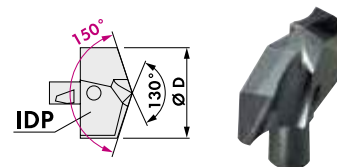
7111

7114

# ATORN® ETD 840 indexable inserts



- innovative, efficient cutting edge geometry
- Precision-ground
- Adapted to tool holder
- Excellent wear-resistance and cutting properties
- All intermediate dimensions available in 0.1 mm increments



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GPP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	●	●	○	●	●	●	●	●	○	○	●		○			

D h7 mm	art.no.	€
8.0	106020 0080	45,-
8.5	106020 0085	45,-
8.8	106020 0088	45,-
9.0	106020 0090	52,90
9.3	106020 0093	52,90
9.5	106020 0095	52,90
9.8	106020 0098	52,90
10.0	106020 0100	54,50
10.2	106020 0102	54,50
10.5	106020 0105	54,50
10.8	106020 0108	54,50
11.0	106020 0110	64,10
11.2	106020 0112	64,10
11.5	106020 0115	64,10
11.8	106020 0118	64,10
12.0	106020 0120	75,30
12.5	106020 0125	75,30
12.8	106020 0128	75,30
13.0	106020 0130	75,30
13.1	106020 0131	75,30
13.5	106020 0135	75,30
13.8	106020 0138	75,30
14.0	106020 0140	86,-
14.5	106020 0145	86,-
14.8	106020 0148	86,-
15.0	106020 0150	86,-
15.1	106020 0151	86,-
15.5	106020 0155	86,-
15.8	106020 0158	86,-
16.0	106020 0160	91,10
16.1	106020 0161	91,10
16.5	106020 0165	91,10
16.8	106020 0168	91,10
17.0	106020 0170	91,10
17.5	106020 0175	91,10

1153

D h7 mm	art.no.	€
17.8	106020 0178	91,10
18.0	106020 0180	110,-
18.5	106020 0185	110,-
18.8	106020 0188	110,-
19.0	106020 0190	110,-
19.5	106020 0195	110,-
19.8	106020 0198	110,-
20.0	106020 0200	110,-
20.5	106020 0205	110,-
20.8	106020 0208	110,-
21.0	106020 0210	110,-
21.5	106020 0215	110,-
21.8	106020 0218	110,-
22.0	106020 0220	122,50
22.5	106020 0225	122,50
22.8	106020 0228	122,50
23.0	106020 0230	122,50
23.5	106020 0235	122,50
23.8	106020 0238	122,50
24.0	106020 0240	148,50
24.5	106020 0245	148,50
24.8	106020 0248	148,50
25.0	106020 0250	148,50
25.5	106020 0255	148,50
25.7	106020 0257	148,50
26.0	106020 0260	170,-
26.5	106020 0265	170,-
26.7	106020 0267	170,-
27.0	106020 0270	170,-
27.5	106020 0275	170,-
27.7	106020 0277	170,-
28.0	106020 0280	193,50
28.5	106020 0285	193,50
28.7	106020 0287	193,50
29.0	106020 0290	193,50

1153

D h7 mm	art.no.	€
29.5	106020 0295	193,50
29.7	106020 0297	193,50
30.0	106020 0300	234,-
30.5	106020 0305	234,-
30.7	106020 0307	234,-
31.0	106020 0310	234,-
31.5	106020 0315	234,-
31.7	106020 0317	234,-
32.0	106020 0320	255,-
32.5	106020 0325	255,-
32.7	106020 0327	255,-
33.0	106020 0330	255,-
33.5	106020 0335	255,-
33.7	106020 0337	255,-
34.0	106020 0340	290,-
34.5	106020 0345	290,-
34.7	106020 0347	290,-
35.0	106020 0350	290,-
35.5	106020 0355	290,-
35.7	106020 0357	290,-
36.0	106020 0360	331,-
36.5	106020 0365	331,-
36.7	106020 0367	331,-
37.0	106020 0370	331,-
37.5	106020 0375	331,-
37.7	106020 0377	331,-
38.0	106020 0380	346,-
38.5	106020 0385	346,-
38.7	106020 0387	346,-
39.0	106020 0390	346,-
39.5	106020 0395	346,-
39.7	106020 0397	346,-
40.0	106020 0400	375,-

1153



Deep drilling ...

... with brainpower.

**ATORN®**  
Performance demands quality

## Replaceable head drill PXD



390

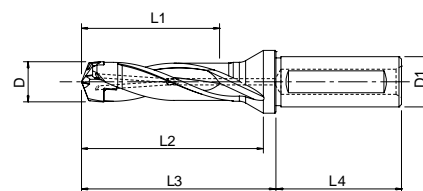
- Drilling in diameter range 14 - 25.4mm
- special cutting geometry for larger diameters
- internal coolant supply
- **bayonet system for safe and fast boring head change**
- high bore surface quality and precision
- polished chip chambers for low-vibration and reliable chip removal
- **Supplied with chuck key**



### PXD-3D

D mm	L1 mm	L2 mm	L3 mm	L4 mm	D1 mm	art.no.	€
14 - 14.49	43	63.4	69.9	48	16	<b>125303 0140</b>	<b>236,-</b>
14.5 - 14.99	43	65.5	72	48	16	125303 0145	<b>236,-</b>
15 - 15.99	46.5	67.1	73.6	50	20	125303 0150	<b>247,50</b>
16 - 16.99	49.5	71.7	78.2	50	20	125303 0160	<b>247,50</b>
17 - 17.99	52.5	76.8	83.3	50	20	125303 0170	<b>286,60</b>
18 - 18.99	55.5	81.4	87.9	56	25	125303 0180	<b>315,60</b>
19 - 19.99	58.5	85.4	91.9	56	25	125303 0190	<b>315,60</b>
20 - 20.99	61.5	90.1	96.6	56	25	125303 0200	<b>378,30</b>
21 - 21.99	64.5	94.7	101.2	60	32	125303 0210	<b>378,30</b>
22 - 22.99	67.5	98.8	105.3	60	32	125303 0220	<b>346,70</b>
23 - 23.99	70.5	103.4	109.9	60	32	125303 0230	<b>416,-</b>
24 - 24.99	73.5	108.4	114.9	60	32	125303 0240	<b>416,-</b>
25 - 25.99	76.5	112	118.5	60	32	125303 0250	<b>465,50</b>

1169



### PXD-5D

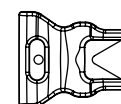
D mm	L1 mm	L2 mm	L3 mm	L4 mm	D1 mm	art.no.	€
14 - 14.49	71.2	92.9	97.9	48	16	<b>125305 0140</b>	<b>282,80</b>
14.5 - 14.99	73.7	96	101	48	16	125305 0145	<b>282,80</b>
15 - 15.99	77.5	97.1	103.6	50	20	125305 0150	<b>297,20</b>
16 - 16.99	82.5	103.7	110.2	50	20	125305 0160	<b>297,20</b>
17 - 17.99	87.5	110.8	117.3	50	20	125305 0170	<b>343,80</b>
18 - 18.99	92.5	117.4	123.9	56	25	125305 0180	<b>378,30</b>
19 - 19.99	97.5	123.4	129.9	56	25	125305 0190	<b>378,30</b>
20 - 20.99	102.5	130.1	136.6	56	25	125305 0200	<b>453,70</b>
21 - 21.99	107.5	136.7	143.2	60	32	125305 0210	<b>453,70</b>
22 - 22.99	112.5	142.8	149.3	60	32	125305 0220	<b>453,70</b>
23 - 23.99	117.5	149.4	155.9	60	32	125305 0230	<b>499,10</b>
24 - 24.99	122.5	156.4	162.9	60	32	125305 0240	<b>499,10</b>
25 - 25.99	127.5	162	168.5	60	32	125305 0250	<b>558,70</b>

1169

### Chuck key

for boring head	t mm	art.no.	€
14 - 18.9 mm	1.5	<b>125399 0015</b>	<b>21,70</b>
19 - 22.9 mm	1.8	125399 0018	<b>21,70</b>
23 - 25.4 mm	2	125399 0020	<b>22,20</b>

1169

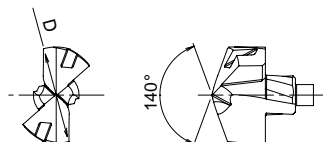


**Replaceable boring heads PXD**

**NEW**

VHM  140°  TiAlN   390

- Diameter 14 - 25.4mm
- innovative cutting edge geometry and modern WDI-coatings
- high drilling accuracy, surface finish quality and radial run-out
- wide range of applications in the ISO, P, K and N material groups



D mm	ISO P		ISO K		ISO N	
	art.no.	€	art.no.	€	art.no.	€
14	125320 1400	70,60	125321 1400	70,60	125322 1400	70,60
14.5	125320 1450	70,60	125321 1450	70,60	125322 1450	70,60
14.95	125320 1495	70,60				
15	125320 1500	74,10	125321 1500	74,10	125322 1500	74,10
15.25	125320 1525	74,10				
15.5	125320 1550	74,10	125321 1550	74,10	125322 1550	74,10
16	125320 1600	74,10	125321 1600	74,10	125322 1600	74,10
16.5	125320 1650	85,70	125321 1650	85,70	125322 1650	85,70
16.7	125320 1670	85,70	125321 1670	85,70	125322 1670	85,70
17	125320 1700	85,70	125321 1700	85,70	125322 1700	85,70
17.25	125320 1725	85,70				
17.5	125320 1750	85,70	125321 1750	85,70	125322 1750	85,70
18	125320 1800	85,70	125321 1800	85,70	125322 1800	85,70
18.5	125320 1850	94,90	125321 1850	94,90	125322 1850	94,90
18.7	125320 1870	94,90	125321 1870	94,90	125322 1870	94,90
19	125320 1900	94,90	125321 1900	94,90	125322 1900	94,90
19.28	125320 1928	94,90				
	1170		1170		1170	

D mm	ISO P		ISO K		ISO N	
	art.no.	€	art.no.	€	art.no.	€
19.5	125320 1950	94,90	125321 1950	94,90	125322 1950	94,90
20	125320 2000	104,30	125321 2000	104,30	125322 2000	104,30
20.5	125320 2050	104,30	125321 2050	104,30	125322 2050	104,30
20.7	125320 2070	104,30	125321 2070	104,30	125322 2070	104,30
21	125320 2100	112,40	125321 2100	112,40	125322 2100	112,40
21.25	125320 2125	112,40				
21.5	125320 2150	112,40	125321 2150	112,40	125322 2150	112,40
22	125320 2200	112,40	125321 2200	112,40	125322 2200	112,40
22.4	125320 2240	112,40	125321 2240	112,40	125322 2240	112,40
22.5	125320 2250	112,40	125321 2250	112,40	125322 2250	112,40
23	125320 2300	112,40	125321 2300	112,40	125322 2300	112,40
23.25	125320 2325	112,40				
23.5	125320 2350	112,40	125321 2350	112,40	125322 2350	112,40
24	125320 2400	121,10	125321 2400	121,10	125322 2400	121,10
24.5	125320 2450	121,10	125321 2450	121,10	125322 2450	121,10
25	125320 2500	121,10	125321 2500	121,10	125322 2500	121,10
25.4	125320 2540	121,10	125321 2540	121,10	125322 2540	121,10
	1170		1170		1170	

**RIGHT ACROSS EUROPE.**  
**WE MANAGE THAT FOR YOU**  
**WITHIN 24 HOURS:**  
**24-HOUR DELIVERY**  
**THROUGHOUT EUROPE**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
 A BRAND OF SARTORIUS WERKZEUGE

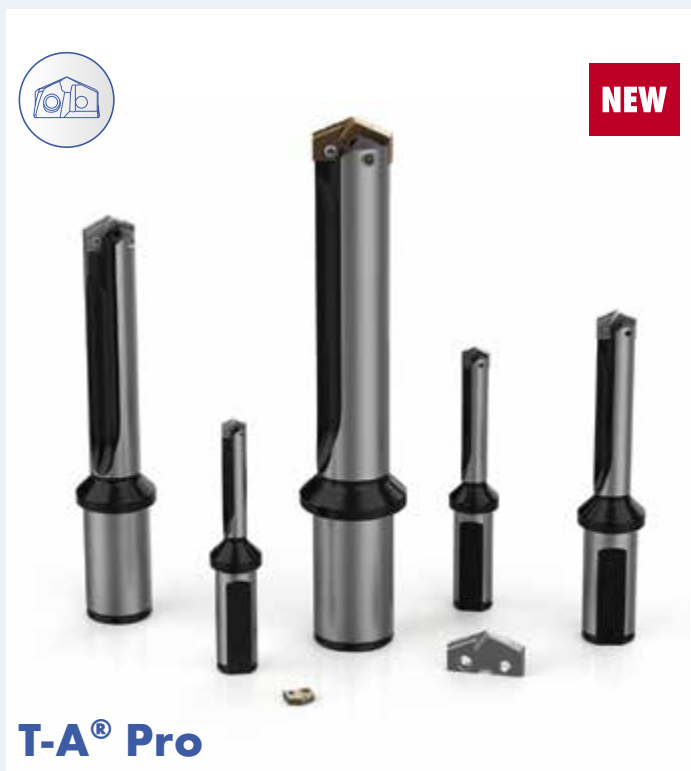
## Modular drilling systems

**INFO**


Modular drills from Allied Machine & Engineering Co. (AMEC) meet the increasing demands of customers from various industries. Solutions are provided not only for general mechanical engineering, but also for the automotive sector and aerospace technology. The flexible drill systems are characterised by their universal application capabilities and in particular by the combination of cutting materials, coatings and geometries.

### Guaranteed application

Describe your machining problem to us. Working with the manufacturer, we will draw up a quotation for you for the use of appropriate tools. Allied Machine Engineering Co. guarantees the feasibility of the project.



### T-A<sup>®</sup> Pro

- Diameter range 11.10 to 47.80 mm
- Geometries and basic materials for machining steel, cast iron and non-ferrous metals
- Material-specific geometries in accordance with ISO for simplified tool selection
- New support and coolant bore design for improved chip removal
- Drill depths up to 15 x D



### GEN2 T-A<sup>®</sup> and T-A<sup>®</sup> Original

- Diameter range 9.50 - 160.00 mm
- Various geometries, base substrates and coatings available
- Exchangeable cutting inserts reduce regrinding work
- 1.5 x D to 32 x D in the AMEC standard range

You can find the entire range in the Allied Maxcut special catalogue. Request your free copy now!

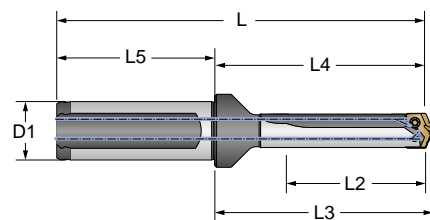




# Series Z Drilling system T-A Pro™



- Series Z, diameter range 11.20 - 12.60 mm
- Drilling depths up to 15 x D
- Supports with innovative coolant bore system for higher flow rate
- Cutting fluid is fed directly under the chip and creates a "hydraulic wedge"
- Sturdy support and new chip flute design for safe chip removal
- **3 material-specific geometries available**
- Wide range of applications in the ISO material groups P, M, K and N

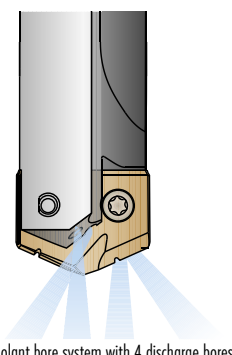


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
105980....		●	●	●	○	○	○			○	○	○					○			
105982....								●	●											
105984....													●	●	●					

## Series Z holder

Type	D mm	L2 mm	L4 mm	L3 mm	L mm	L5 mm	D1 mm			art.no.	€
3xD (A)	11.11 - 12.60	36.9	68.4	71.2	118.4	50	20	A1	B1	105023 0103	293,-
5xD (A)	11.11 - 12.60	36.9	68.4	71.2	142.5	50	20	A1	B1	105023 0105	310,-
7xD (A)	11.11 - 12.60	85.0	116.5	119.3	166.6	50	20	A1	B1	105023 0107	325,-
10xD (A)	11.11 - 12.60	121.2	152.7	155.5	202.7	50	20	A1	B1	105023 0110	341,-
12xD (A)	11.11 - 12.60	145.2	176.7	179.5	226.8	50	20	A1	B1	105023 0112	360,-
15xD (A)	11.11 - 12.60	181.4	212.9	215.7	262.9	50	20	A1	B1	105023 0115	385,-

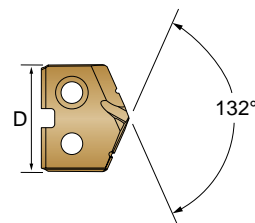
1141



Coolant bore system with 4 discharge bores

## Series Z carbide cutting inserts

D mm	AM300			TiAlN			TiCN		
	art.no.	€		art.no.	€		art.no.	€	
11.50	2 105980 1150	74,90		2 105982 1150	74,90		2 105984 1150	74,90	
12.00	2 105980 1200	74,90		2 105982 1200	74,90		2 105984 1200	74,90	
12.50	2 105980 1250	74,90		2 105982 1250	74,90		2 105984 1250	74,90	
	1183			1183			1183		



AM300



TiAlN



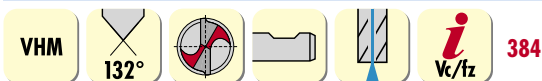
TiCN

## Spare parts

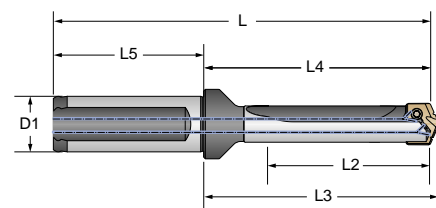
Screw		TORX PLUS	
art.no.	€	art.no.	€
A1 105085 0020	3,26	B1 705145 0007	6,75
1145		7113	

# Series 0 Drilling system T-A Pro™

NEW



- Series 0, diameter range 12.70 - 17.60 mm
- Drilling depths up to 15 x D
- Supports with innovative coolant bore system for higher flow rate
- Cutting fluid is fed directly under the chip and creates a "hydraulic wedge"
- Sturdy support and new chip flute design for safe chip removal
- 3 material-specific geometries available
- Wide range of applications in the ISO material groups P, M, K and N

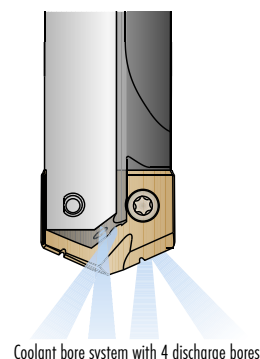


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
105980....		●	●	●	○	○	○			○	○	○					○			
105982....								●	●											
105984....													●	●	●					

## Series 0 holder

Type	D mm	L2 mm	L4 mm	L3 mm	L mm	L5 mm	D1 mm			art.no.	€
3xD (A)	12.70 - 15.00	45.9	77.8	80.5	129.4	51.6	20	A1	B1	105025 0103	301,-
3xD (C)	15.08 - 17.60	45.9	77.8	80.5	129.4	51.6	20	A2	B1	105025 0303	301,-
5xD (A)	12.70 - 15.00	76.6	108.5	111.2	160	51.6	20	A1	B1	105025 0105	317,-
5xD (C)	15.08 - 17.60	76.6	108.5	111.2	160	51.6	20	A2	B1	105025 0305	317,-
7xD (A)	12.70 - 15.00	107.2	139.1	141.8	190.7	51.6	20	A1	B1	105025 0107	338,-
7xD (C)	15.08 - 17.60	107.2	139.1	141.8	190.7	51.6	20	A2	B1	105025 0307	338,-
10xD (A)	12.70 - 15.00	153.2	185	187.8	236.6	51.6	20	A1	B1	105025 0110	365,-
10xD (C)	15.08 - 17.60	153.2	185	187.8	236.6	51.6	20	A2	B1	105025 0310	365,-
12xD (A)	12.70 - 15.00	183.8	215.7	218.4	267.2	51.6	20	A1	B1	105025 0112	390,-
12xD (C)	15.08 - 17.60	183.8	215.7	218.4	267.2	51.6	20	A2	B1	105025 0312	390,-
15xD (A)	12.70 - 15.00	229.7	261.6	264.3	313.2	51.6	20	A1	B1	105025 0115	425,-
15xD (C)	15.08 - 17.60	229.7	261.6	264.3	313.2	51.6	20	A2	B1	105025 0315	425,-

1141



Coolant bore system with 4 discharge bores

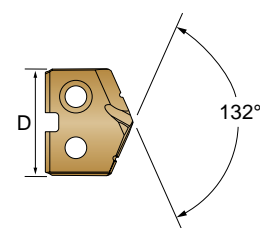
## Series 0 carbide cutting inserts

D mm	AM300		TiAlN		TiCN	
	art.no.	€	art.no.	€	art.no.	€
12.80	2 105980 1280	82,20	2 105982 1280	82,20	2 105984 1280	82,20
13.00	2 105980 1300	82,20	2 105982 1300	82,20	2 105984 1300	82,20
13.50	2 105980 1350	82,20	2 105982 1350	82,20	2 105984 1350	82,20
14.00	2 105980 1400	82,20	2 105982 1400	82,20	2 105984 1400	82,20
14.50	2 105980 1450	82,20	2 105982 1450	82,20	2 105984 1450	82,20
14.80	2 105980 1480	82,20	2 105982 1480	82,20	2 105984 1480	82,20
15.00	2 105980 1500	82,20	2 105982 1500	82,20	2 105984 1500	82,20
15.20	2 105980 1520	82,20	2 105982 1520	82,20	2 105984 1520	82,20
15.50	2 105980 1550	82,20	2 105982 1550	82,20	2 105984 1550	82,20
16.00	2 105980 1600	82,20	2 105982 1600	82,20	2 105984 1600	82,20
16.50	2 105980 1650	82,20	2 105982 1650	82,20	2 105984 1650	82,20
17.00	2 105980 1700	82,20	2 105982 1700	82,20	2 105984 1700	82,20
17.50	2 105980 1750	82,20	2 105982 1750	82,20	2 105984 1750	82,20

1183

1183

1183



## Spare parts

Screw		TORX PLUS	
art.no.	€	art.no.	€
A1 105085 0030	3,26	B1 705145 0008	6,75
A2 105085 0035	3,26		

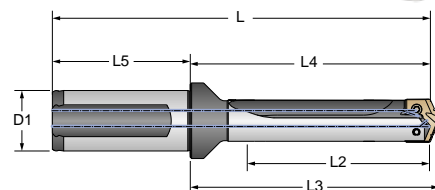
1145

7113

# Series 1 Drilling system T-A Pro™



- Series 1, diameter range 17.70 - 24.30 mm
- Drilling depths up to 15 x D
- Supports with innovative coolant bore system for higher flow rate
- Cutting fluid is fed directly under the chip and creates a "hydraulic wedge"
- Sturdy support and new chip flute design for safe chip removal
- 3 material-specific geometries available
- Wide range of applications in the ISO material groups P, M, K and N

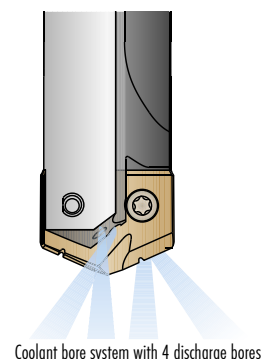


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
105980....		●	●	●	○	○	○			○	○	○					○			
105982....								●	●											
105984....													●	●	●					

## Series 1 holder

Type	D mm	L2 mm	L4 mm	L3 mm	L mm	L5 mm	D1 mm	holder		art.no.	€
3xD (A)	17.70 - 20.50	62.9	100.9	104.5	158.8	57.9	25	A1	B1	105027 0103	345,-
3xD (C)	20.60 - 24.30	62.9	100.9	104.5	158.8	57.9	25	A2	B1	105027 0303	345,-
5xD (A)	17.70 - 20.50	104.8	142.8	146.4	200.7	57.9	25	A1	B1	105027 0105	370,-
5xD (C)	20.60 - 24.30	104.8	142.8	146.4	200.7	57.9	25	A2	B1	105027 0305	370,-
7xD (A)	17.70 - 20.50	146.7	184.7	188.3	242.7	57.9	25	A1	B1	105027 0107	399,-
7xD (C)	20.60 - 24.30	146.7	184.7	188.3	242.7	57.9	25	A2	B1	105027 0307	399,-
10xD (A)	17.70 - 20.50	209.6	247.6	251.2	305.5	57.9	25	A1	B1	105027 0110	425,-
10xD (C)	20.60 - 24.30	209.6	247.6	251.2	305.5	57.9	25	A2	B1	105027 0310	425,-
12xD (A)	17.70 - 20.50	251.5	289.5	293.1	347.4	57.9	25	A1	B1	105027 0112	465,-
12xD (C)	20.60 - 24.30	251.5	289.5	293.1	347.4	57.9	25	A2	B1	105027 0312	465,-
15xD (A)	17.70 - 20.50	314.3	352.4	355.9	410.3	57.9	25	A1	B1	105027 0115	529,-
15xD (C)	20.60 - 24.30	314.3	352.4	355.9	410.3	57.9	25	A2	B1	105027 0315	529,-

1141



Coolant bore system with 4 discharge bores

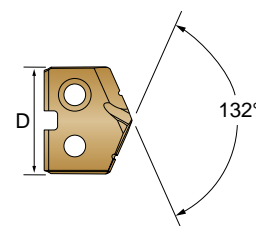
## Series 1 carbide cutting inserts

D mm	AM300		TiAlN		TiCN	
	art.no.	€	art.no.	€	art.no.	€
18.00	2 105980 1800	94,60	2 105982 1800	94,60	2 105984 1800	94,60
18.50	2 105980 1850	94,60	2 105982 1850	94,60	2 105984 1850	94,60
19.00	2 105980 1900	94,60	2 105982 1900	94,60	2 105984 1900	94,60
19.50	2 105980 1950	94,60	2 105982 1950	94,60	2 105984 1950	94,60
20.00	2 105980 2000	94,60	2 105982 2000	94,60	2 105984 2000	94,60
20.50	2 105980 2050	94,60	2 105982 2050	94,60	2 105984 2050	94,60
21.00	2 105980 2100	94,60	2 105982 2100	94,60	2 105984 2100	94,60
21.50	2 105980 2150	94,60	2 105982 2150	94,60	2 105984 2150	94,60
22.00	2 105980 2200	94,60	2 105982 2200	94,60	2 105984 2200	94,60
22.50	2 105980 2250	94,60	2 105982 2250	94,60	2 105984 2250	94,60
23.00	2 105980 2300	94,60	2 105982 2300	94,60	2 105984 2300	94,60
23.50	2 105980 2350	94,60	2 105982 2350	94,60	2 105984 2350	94,60
24.00	2 105980 2400	94,60	2 105982 2400	94,60	2 105984 2400	94,60

1183

1183

1183



AM300



TiAlN



TiCN

## Spare parts

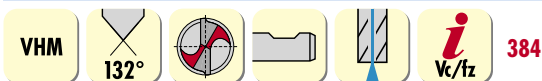
Screw		TORX PLUS	
art.no.	€	art.no.	€
A1 105085 0050	3,26	B1 705145 0009	7,20
A2 105085 0060	2,55		

1145

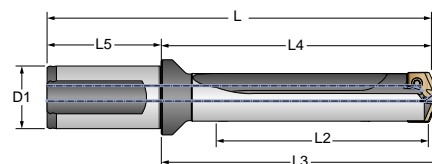
7113

# Series 2 Drilling system T-A Pro™

NEW



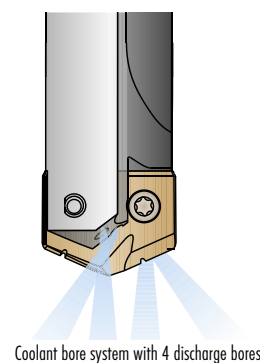
- Series 2, diameter range 24.40 - 35.00 mm
- Drilling depths up to 15 x D
- Supports with innovative coolant bore system for higher flow rate
- Cutting fluid is fed directly under the chip and creates a "hydraulic wedge"
- Sturdy support and new chip flute design for safe chip removal
- 3 material-specific geometries available
- Wide range of applications in the ISO material groups P, M, K and N



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
105980....		●	●	●	○	○	○	●	●	○	○	○					○			
105982....																				
105984....													●	●	●					

### Series 2 holder

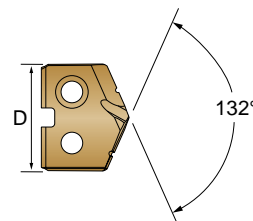
Type	D mm	L2 mm	L4 mm	L3 mm	L mm	L5 mm	D1 mm	Screws		art.no.	€
3xD (A)	24.40 - 28.40	89.2	137.4	141	195.4	57.9	32	A1	B1	105029 0103	380,-
3xD (C)	28.50 - 35.00	89.2	137.4	141	195.4	57.9	32	A1	B1	105029 0303	380,-
5xD (A)	24.40 - 28.40	148.7	196.9	200.5	254.8	57.9	32	A1	B1	105029 0105	410,-
5xD (C)	28.50 - 35.00	148.7	196.9	200.5	254.8	57.9	32	A1	B1	105029 0305	410,-
7xD (A)	24.40 - 28.40	208.2	256.4	260	314.3	57.9	32	A1	B1	105029 0107	440,-
7xD (C)	28.50 - 35.00	208.2	256.4	260	314.3	57.9	32	A1	B1	105029 0307	440,-
10xD (A)	24.40 - 28.40	297.4	345.6	349.2	403.6	57.9	32	A1	B1	105029 0110	465,-
10xD (C)	28.50 - 35.00	297.4	345.6	349.2	403.6	57.9	32	A1	B1	105029 0310	465,-
12xD (A)	24.40 - 28.40	356.9	405.1	408.7	463	57.9	32	A1	B1	105029 0112	509,-
12xD (C)	28.50 - 35.00	356.9	405.1	408.7	463	57.9	32	A1	B1	105029 0312	509,-
15xD (A)	24.40 - 28.40	446.2	494.4	497.9	552.3	57.9	32	A1	B1	105029 0115	579,-
15xD (C)	28.50 - 35.00	446.2	494.4	497.9	552.3	57.9	32	A1	B1	105029 0315	579,-



Coolant bore system with 4 discharge bores

### Series 2 carbide cutting inserts

D mm	AM300		TiAlN		TiCN	
	art.no.	€	art.no.	€	art.no.	€
24.50	2 105980 2450	112,50	2 105982 2450	112,50	2 105984 2450	112,50
25.00	2 105980 2500	112,50	2 105982 2500	112,50	2 105984 2500	112,50
25.50	2 105980 2550	112,50	2 105982 2550	112,50	2 105984 2550	112,50
26.00	2 105980 2600	112,50	2 105982 2600	112,50	2 105984 2600	112,50
26.50	2 105980 2650	112,50	2 105982 2650	112,50	2 105984 2650	112,50
27.00	2 105980 2700	112,50	2 105982 2700	112,50	2 105984 2700	112,50
27.50	2 105980 2750	112,50	2 105982 2750	112,50	2 105984 2750	112,50
28.00	2 105980 2800	112,50	2 105982 2800	112,50	2 105984 2800	112,50
28.50	2 105980 2850	112,50	2 105982 2850	112,50	2 105984 2850	112,50
29.00	2 105980 2900	112,50	2 105982 2900	112,50	2 105984 2900	112,50
29.50	2 105980 2950	112,50	2 105982 2950	112,50	2 105984 2950	112,50
30.00	2 105980 3000	112,50	2 105982 3000	112,50	2 105984 3000	112,50
30.50	2 105980 3050	112,50	2 105982 3050	112,50	2 105984 3050	112,50
31.00	2 105980 3100	112,50	2 105982 3100	112,50	2 105984 3100	112,50
31.50	2 105980 3150	112,50	2 105982 3150	112,50	2 105984 3150	112,50
32.00	2 105980 3200	112,50	2 105982 3200	112,50	2 105984 3200	112,50
32.50	2 105980 3250	112,50	2 105982 3250	112,50	2 105984 3250	112,50
33.00	2 105980 3300	112,50	2 105982 3300	112,50	2 105984 3300	112,50
33.50	2 105980 3350	112,50	2 105982 3350	112,50	2 105984 3350	112,50
34.00	2 105980 3400	112,50	2 105982 3400	112,50	2 105984 3400	112,50
34.50	2 105980 3450	112,50	2 105982 3450	112,50	2 105984 3450	112,50
35.00	2 105980 3500	112,50	2 105982 3500	112,50	2 105984 3500	112,50



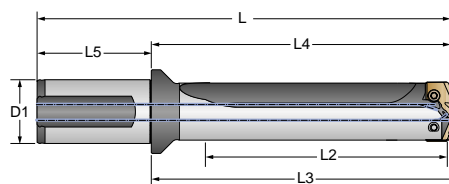
### Spare parts

Screw		TORX PLUS	
art.no.	€	art.no.	€
A1 105085 0070	3,26	B1 705145 0015	7,65
1145		7113	

# Series 3 Drilling system T-A Pro™



- Series 3, diameter range 35.80 - 47.60 mm
- Drilling depths up to 15 x D
- Supports with innovative coolant bore system for higher flow rate
- Cutting fluid is fed directly under the chip and creates a "hydraulic wedge"
- Sturdy support and new chip flute design for safe chip removal
- 3 material-specific geometries available
- Wide range of applications in the ISO material groups P, M, K and N

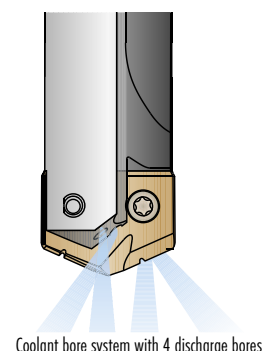


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRF/EPF/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
105980....		●	●	●	○	○	○			○	○	○						○		
105982....								●	●											
105984....													●	●	●					

## Series 3 holder

Type	D mm	L2 mm	L4 mm	L3 mm	L mm	L5 mm	D1 mm			art.no.	€
3xD (A)	35.72 - 40.90	123.3	180.1	184.8	248.3	68.3	40	A1	B1	105031 0103	420,-
3xD (C)	41.00 - 47.63	123.3	180.1	184.8	248.3	68.3	40	A1	B1	105031 0303	420,-
5xD (A)	35.72 - 40.90	205.5	262.2	267	330.5	68.3	40	A1	B1	105031 0105	450,-
5xD (C)	41.00 - 47.63	205.5	262.2	267	330.5	68.3	40	A1	B1	105031 0305	450,-
7xD (A)	35.72 - 40.90	287.7	344.4	349.2	412.7	68.3	40	A1	B1	105031 0107	480,-
7xD (C)	41.00 - 47.63	287.7	344.4	349.2	412.7	68.3	40	A1	B1	105031 0307	480,-
10xD (A)	35.72 - 40.90	411	467.7	472.5	536	68.3	40	A1	B1	105031 0110	519,-
10xD (C)	41.00 - 47.63	411	467.7	472.5	536	68.3	40	A1	B1	105031 0310	519,-
12xD (A)	35.72 - 40.90	493.2	549.9	554.7	618.2	68.3	40	A1	B1	105031 0112	559,-
12xD (C)	41.00 - 47.63	493.2	549.9	554.7	618.2	68.3	40	A1	B1	105031 0312	559,-
15xD (A)	35.72 - 40.90	616.5	673.2	678	741.5	68.3	40	A1	B1	105031 0115	639,-
15xD (C)	41.00 - 47.63	616.5	673.2	678	741.5	68.3	40	A1	B1	105031 0315	639,-

1141



Coolant bore system with 4 discharge bores

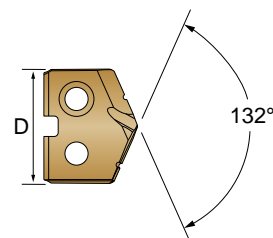
## Series 3 carbide cutting inserts

D mm	AM300		TiAlN		TiCN	
	art.no.	€	art.no.	€	art.no.	€
36.00	105980 3600	143,50	105982 3600	143,50	105984 3600	143,50
36.50	105980 3650	143,50	105982 3650	143,50	105984 3650	143,50
37.00	105980 3700	143,50	105982 3700	143,50	105984 3700	143,50
37.50	105980 3750	143,50	105982 3750	143,50	105984 3750	143,50
38.00	105980 3800	143,50	105982 3800	143,50	105984 3800	143,50
38.50	105980 3850	143,50	105982 3850	143,50	105984 3850	143,50
39.00	105980 3900	143,50	105982 3900	143,50	105984 3900	143,50
39.50	105980 3950	143,50	105982 3950	143,50	105984 3950	143,50
40.00	105980 4000	143,50	105982 4000	143,50	105984 4000	143,50
40.50	105980 4050	143,50	105982 4050	143,50	105984 4050	143,50
41.00	105980 4100	143,50	105982 4100	143,50	105984 4100	143,50
41.50	105980 4150	143,50	105982 4150	143,50	105984 4150	143,50
42.00	105980 4200	143,50	105982 4200	143,50	105984 4200	143,50
42.50	105980 4250	143,50	105982 4250	143,50	105984 4250	143,50
43.00	105980 4300	143,50	105982 4300	143,50	105984 4300	143,50
43.50	105980 4350	143,50	105982 4350	143,50	105984 4350	143,50
44.00	105980 4400	143,50	105982 4400	143,50	105984 4400	143,50
44.50	105980 4450	143,50	105982 4450	143,50	105984 4450	143,50
45.00	105980 4500	143,50	105982 4500	143,50	105984 4500	143,50
45.50	105980 4550	143,50	105982 4550	143,50	105984 4550	143,50
46.00	105980 4600	143,50	105982 4600	143,50	105984 4600	143,50
46.50	105980 4650	143,50	105982 4650	143,50	105984 4650	143,50
47.00	105980 4700	143,50	105982 4700	143,50	105984 4700	143,50
47.50	105980 4750	143,50	105982 4750	143,50	105984 4750	143,50

1183

1183

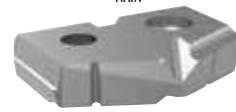
1183



AM300



TiAlN



TiCN

## Spare parts

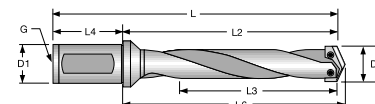
Screw		TORX PLUS	
art.no.	€	art.no.	€
A1 105085 0080	3,26	B1 705145 0020	8,15
1145		7113	

# Drilling system T-A® Series Y



- Internal coolant supply (\* holders also have a 1/8 inch coolant supply connection on the side)
- Also available in MT version

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
105140....	●	●	●	●	○	○	○	○	○	○	○	○	○	○	●					
105147....	○	●	●	●	●	●	●	●	●	●	●	●	○	○	●		○			



## Series Y holder with straight shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread			art.no.	€
Straight-fluted	Extra-short	9.50-11.00	19	47.6	50	95.6	16	48	1/16" *	A1	B1	105001 0010	243,-
Straight-fluted	Short	9.50-11.00	32	61.1	63.5	111.1	20	50	1/8"	A1	B1	105001 0020	224,-
Spiral-fluted	Standard	9.50-11.00	60	89.7	92.1	139.7	20	50	1/8"	A1	B1	105001 0030	251,-
Spiral-fluted	Standard plus	9.50-11.00	86	115.4	117.8	165.4	20	50	1/8"	A1	B1	105001 0035	265,-
Spiral-fluted	Extra-long	9.50-11.00	111	140.5	142.9	190.5	20	50	1/8"	A1	B1	105001 0040	283,-
Straight-fluted	XL	9.50-11.00	222	251.7	254.1	301.7	20	50	1/8"	A1	B1	105001 0050	281,-
Straight-fluted	3XL	9.50-11.00	290	319.9	322.3	369.9	20	50	1/8"	A1	B1	105001 0060	349,-

1141

## Series Y cutting inserts

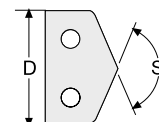
- Other quality grades and diameters available on request, some from stock.



D mm	S	☞	HSS Super Kobalt AM200™		Carbide C1 K35 AM300™		
			art.no.	€	art.no.	€	
9.50	132	2	105140 0950	47,80	2	105147 0950	71,30
10.00	132	2	105140 1000	47,80	2	105147 1000	71,30
10.20	132	2	105140 1020	47,80	2	105147 1020	71,30
10.50	132	2	105140 1050	47,80	2	105147 1050	71,30
10.80	132	2	105140 1080	47,80	2	105147 1080	71,30
11.00	132	2	105140 1100	47,80	2	105147 1100	71,30

1142

1143



## Spare parts

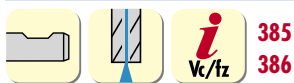
Screw		TORX PLUS	
art.no.	€	art.no.	€
A1 105085 0010	3,46	B1 705145 0007	6,75

1145

7113

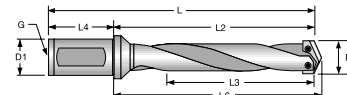


# Drilling system T-A® Series Z



- Internal coolant supply (\* holders also have a 1/8 inch coolant supply connection on the side)
- Also available in MT version

material	● very well suited	steel			stainless steel			cast iron			titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CF/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc		≥ 30 HRc	< 8 % Si	≥ 8 % Si	< 55 HRc			< 60 HRc	≥ 60 HRc	
105236....	●	●	●	●	○	○		○	○	○	○	○	○	○	○	○	○			
105242....	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○		



## Series Z holder with straight shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread			art.no.	€
Straight-fluted	Extra-short	11.11-12.80	19.1	45.6	48	93.6	16	48	1/16" *	A1	B1	105003 0010	243,-
Straight-fluted	Short	11.11-12.80	32	61.1	63.5	111.1	20	50	1/8"	A1	B1	105003 0020	224,-
Spiral-fluted	Standard	11.11-12.80	60	89.7	92.1	139.7	20	50	1/8"	A1	B1	105003 0030	251,-
Spiral-fluted	Standard plus	11.11-12.80	86	115.4	117.8	165.4	20	50	1/8"	A1	B1	105003 0035	265,-
Spiral-fluted	Extra-long	11.11-12.80	111	140.5	142.9	190.5	20	50	1/8"	A1	B1	105003 0040	283,-
Spiral-fluted	Lang	11.11-12.80	180	209.4	211.8	259.4	20	50	1/8"	A1	B1	105003 0045	279,-
Straight-fluted	XL	11.11-12.80	222.3	251.7	254.1	301.7	20	50	1/8"	A1	B1	105003 0050	281,-
Straight-fluted	3XL	11.11-12.80	290.5	319.9	322.3	369.9	20	50	1/8"	A1	B1	105003 0060	349,-

1141

## Series Z cutting inserts

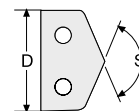
- Other quality grades and diameters available on request, some from stock.



D mm	S	☒	HSS Super Kobalt AM200™		Carbide C1 K35 AM300™		
			art.no.	€	art.no.	€	
11.50	132	2	105236 1150	47,80	2	105242 1150	71,30
12.00	132	2	105236 1200	47,80	2	105242 1200	71,30
12.50	132	2	105236 1250	47,80	2	105242 1250	71,30

1142

1143



## Spare parts

Screw	
art.no.	€
A1 105085 0020	3,26

1145

TORX PLUS	
art.no.	€
B1 705145 0007	6,75

7113



... 3 µm

Radial run-out ...

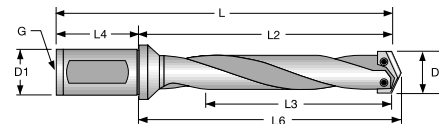
**ATORN®**  
Performance demands quality

# Drilling system T-A® Series 0



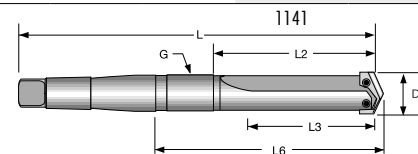
- Internal coolant supply
- \* Holders also have a 1/8 inch coolant supply connection on the side

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	G6/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
105336....	●	●	●	●	○	○		○	○	○	○	○	○	○	○					
105342....	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○		○			



## Series 0 holder with straight shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread	art.no.	€
Straight-fluted	Extra-short	13.00-17.50	22	47.6	50.4	97.6	20	50	1/8" *	A1 B1	105005 0010 243,-
Straight-fluted	Extra-short	15.50-17.50	22	47.6	50.4	97.6	20	50	1/8"	A2 B1	105005 0020 243,-
Straight-fluted	Short	13.00-17.50	35	63.5	66.3	113.5	20	50	1/8"	A1 B1	105005 0030 224,-
Straight-fluted	Short	15.50-17.50	35	63.5	66.3	113.5	20	50	1/8"	A2 B1	105005 0040 224,-
Spiral-fluted	Standard	13.00-17.50	64	92.1	94.9	142.1	20	50	1/8"	A1 B1	105005 0050 251,-
Spiral-fluted	Standard	15.50-17.50	64	92.1	94.9	142.1	20	50	1/8"	A2 B1	105005 0060 251,-
Spiral-fluted	Standard plus	13.00-17.50	89	117.6	120.4	167.6	20	50	1/8"	A1 B1	105005 0065 265,-
Spiral-fluted	Extra-long	13.00-17.50	114	142.9	145.7	192.9	20	50	1/8"	A1 B1	105005 0070 283,-
Spiral-fluted	Extra-long	15.50-17.50	114	142.9	145.7	192.9	20	50	1/8"	A2 B1	105005 0080 283,-
Spiral-fluted	Ultra-long	13.00-17.50	177	206.4	209.1	256.4	20	50	1/8"	A1 B1	105005 0090 334,-
Spiral-fluted	Ultra-long	15.50-17.50	177	206.4	209.1	256.4	20	50	1/8"	A2 B1	105005 0100 334,-
Spiral-fluted	Ultra-long	13.00-17.50	240	268.6	271.4	318.6	20	50	1/8"	A1 B1	105005 0105 347,-
Straight-fluted	XL	13.00-17.50	295	323.9	326.7	373.9	20	50	1/8"	A1 B1	105005 0110 314,-
Straight-fluted	3XL	13.00-17.50	387	416	418.8	466.0	20	50	1/8"	A1 B1	105005 0120 375,-



## Series 0 holder with Morse taper shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	Shank	RCA	Thread	art.no.	€
Straight-fluted	Short	13.00-17.50	35	55.5	92.4	164.3	MT 2	2SRM	1/16"	A1 B1	105006 0010 224,-
Straight-fluted	Short	15.50-17.50	35	55.5	92.4	164.3	MT 2	2SRM	1/16"	A2 B1	105006 0020 224,-
Spiral-fluted	Standard	13.00-17.50	64	84.1	121	192.9	MT 2	2SRM	1/16"	A1 B1	105006 0030 241,-
Spiral-fluted	Standard	15.50-17.50	64	84.1	121	192.9	MT 2	2SRM	1/16"	A2 B1	105006 0040 241,-
Spiral-fluted	Extra-long	13.00-17.50	114	135	171.8	243.7	MT 2	2SRM	1/16"	A1 B1	105006 0050 274,-
Spiral-fluted	Extra-long	15.50-17.50	114	135	171.8	243.7	MT 2	2SRM	1/16"	A2 B1	105006 0060 274,-
Spiral-fluted	Ultra-long	13.00-17.50	177	198.5	235.3	307.2	MT 2	2SRM	1/16"	A1 B1	105006 0070 323,-
Spiral-fluted	Ultra-long	15.50-17.50	177	198.5	235.3	307.2	MT 2	2SRM	1/16"	A2 B1	105006 0080 323,-

1141

## Series 0 cutting inserts

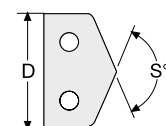
- Other quality grades and diameters available on request, some from stock.



D mm	S	HSS Super Kobalt AM200™		Carbide C1 K35 AM300™	
		art.no.	€	art.no.	€
13.00	132	2 105336 1300	51,40	2 105342 1300	78,40
13.50	132	2 105336 1350	51,40	2 105342 1350	78,40
14.00	132	2 105336 1400	51,40	2 105342 1400	78,40
14.50	132	2 105336 1450	51,40	2 105342 1450	78,40
15.00	132	2 105336 1500	51,40	2 105342 1500	78,40
15.50	132	2 105336 1550	51,40	2 105342 1550	78,40
16.00	132	2 105336 1600	51,40	2 105342 1600	78,40
16.50	132	2 105336 1650	51,40	2 105342 1650	78,40
17.00	132	2 105336 1700	51,40	2 105342 1700	78,40
17.50	132	2 105336 1750	51,40	2 105342 1750	78,40

1142

1143



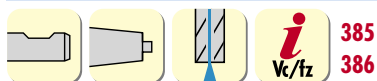
## Spare parts

Screw			TORX PLUS		
	art.no.	€		art.no.	€
A1	105085 0030	3,26	B1	705145 0008	6,75
A2	105085 0040	3,26			

1145

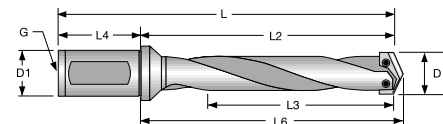
7113

# Drilling system T-A® Series 1



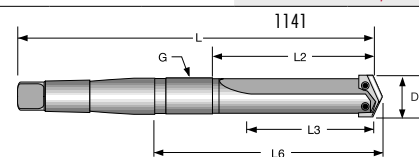
- Internal coolant supply
- \* Holders also have a 1/8 inch coolant supply connection on the side

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
105441....	●	●	●	●	○	○	○	○	○	○	○	○	○	○		○	○	○
105447....	○	●	●	●	●	●	●	●	●	●	●	●	●	●		○	○	○



## Series 1 holder with straight shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread	art.no.	€
Straight-fluted	Extra-short	18.00-24.00	47	75.8	79.4	131.8	25	56	1/8" *	A1 B1	105007 0010 266,-
Straight-fluted	Extra-short	22.00-24.00	57	88.5	92.1	144.5	25	56	1/8" *	A2 B1	105007 0020 288,-
Straight-fluted	Short	18.00-24.00	67	107.2	110.7	163.2	25	56	1/8"	A1 B1	105007 0030 233,-
Straight-fluted	Short	22.00-24.00	67	107.2	110.7	163.2	25	56	1/8"	A2 B1	105007 0040 251,-
Spiral-fluted	Medium-length	18.00-24.00	118	154.8	158.4	210.8	25	56	1/8"	A1 B1	105007 0050 269,-
Spiral-fluted	Medium-length	22.00-24.00	118	154.8	158.4	210.8	25	56	1/8"	A2 B1	105007 0060 289,-
Spiral-fluted	Standard	18.00-24.00	168	205.6	209.2	261.6	25	56	1/8"	A1 B1	105007 0070 297,-
Spiral-fluted	Standard	22.00-24.00	168	205.6	209.2	261.6	25	56	1/8"	A2 B1	105007 0080 316,-
Spiral-fluted	Standard plus	18.00-24.00	219	256.3	259.9	312.3	25	56	1/8"	A1 B1	105007 0085 313,-
Spiral-fluted	Extra-long	18.00-24.00	270	307.2	310.8	363.2	25	56	1/8"	A1 B1	105007 0090 334,-
Spiral-fluted	Extra-long	22.00-24.00	270	307.2	310.8	363.2	25	56	1/8"	A2 B1	105007 0100 355,-
Spiral-fluted	Ultra-long	18.00-24.00	365	402.3	405.9	458.3	25	56	1/8"	A1 B1	105007 0105 360,-
Straight-fluted	XL	18.00-24.00	457	494.5	498.1	550.5	25	56	1/8"	A1 B1	105007 0110 349,-
Straight-fluted	3XL	18.00-24.00	565	602.5	606.1	658.5	25	56	1/8"	A1 B1	105007 0120 425,-



## Series 1 holder with Morse taper shank

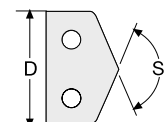
Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	Shank	RCA	Thread	art.no.	€
Straight-fluted	Short	18.00-24.00	70	98.4	142.5	232.5	MT3	3SRM	1/8"	A1 B1	105008 0010 244,-
Straight-fluted	Short	22.00-24.00	70	98.4	142.5	232.5	MT3	3SRM	1/8"	A2 B1	105008 0020 264,-
Spiral-fluted	Medium-length	18.00-24.00	121	149.2	193.3	283.3	MT3	3SRM	1/8"	A1 B1	105008 0030 271,-
Spiral-fluted	Medium-length	22.00-24.00	121	149.2	193.3	283.3	MT3	3SRM	1/8"	A2 B1	105008 0040 290,-
Spiral-fluted	Standard	18.00-24.00	172	200	244.1	334.2	MT3	3SRM	1/8"	A1 B1	105008 0050 288,-
Spiral-fluted	Standard	22.00-24.00	172	200	244.1	334.2	MT3	3SRM	1/8"	A2 B1	105008 0060 307,-
Spiral-fluted	Extra-long	18.00-24.00	273	301.6	345.7	435.8	MT3	3SRM	1/8"	A1 B1	105008 0070 334,-
Spiral-fluted	Extra-long	22.00-24.00	273	301.6	345.7	435.8	MT3	3SRM	1/8"	A2 B1	105008 0080 355,-

## Series 1 cutting inserts

- Other quality grades and diameters available on request, some from stock.



D mm	S	HSS Super Kobalt AM200™		Carbide C1 K35 AM300™	
		art.no.	€	art.no.	€
18.00	132	2 105441 1800	58,10	2 105447 1800	90,30
18.50	132	2 105441 1850	58,10	2 105447 1850	90,30
19.00	132	2 105441 1900	58,10	2 105447 1900	90,30
19.50	132	2 105441 1950	58,10	2 105447 1950	90,30
20.00	132	2 105441 2000	58,10	2 105447 2000	90,30
20.50	132	2 105441 2050	58,10	2 105447 2050	90,30
21.00	132	2 105441 2100	58,10	2 105447 2100	90,30
21.50	132	2 105441 2150	58,10	2 105447 2150	90,30
22.00	132	2 105441 2200	58,10	2 105447 2200	90,30
22.50	132	2 105441 2250	58,10	2 105447 2250	90,30
23.00	132	2 105441 2300	58,10	2 105447 2300	90,30
23.50	132	2 105441 2350	58,10	2 105447 2350	90,30
24.00	132	2 105441 2400	58,10	2 105447 2400	90,30



## Spare parts

Screw			TORX PLUS		
	art.no.	€		art.no.	€
A1	105085 0050	3,26	B1	705145 0009	7,20
A2	105085 0060	2,55			

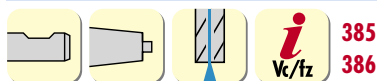
1142

1143

1145

7113

# Drilling system T-A® Series 2



- Internal coolant supply
- \* Holders also have a 1/8 inch coolant supply connection on the side

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
105541....	●	●	●	●	○	○		○	○	○	○	○	○	○	○		○			
105547....	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○		○			



## Series 2 holder with straight shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread	art.no.	€
Straight-fluted	Extra-short	24.50-35.00	57	88.5	92.1	148.5	32	60	1/4" *	A1 B1	105009 0010 295,-
Straight-fluted	Extra-short	30.00-35.00	92	123.4	127	183.4	32	60	1/4" *	A1 B1	105009 0020 324,-
Straight-fluted	Short	24.50-35.00	86	128.6	132.2	188.6	32	60	1/4"	A1 B1	105009 0030 251,-
Straight-fluted	Short	30.00-35.00	86	128.6	132.2	188.6	32	60	1/4"	A1 B1	105009 0040 281,-
Spiral-fluted	Medium-length	24.50-35.00	137	179.4	183	239.4	32	60	1/4"	A1 B1	105009 0050 297,-
Spiral-fluted	Medium-length	30.00-35.00	137	179.4	183	239.4	32	60	1/4"	A1 B1	105009 0060 330,-
Spiral-fluted	Standard	24.50-35.00	187	230.2	233.8	290.2	32	60	1/4"	A1 B1	105009 0070 325,-
Spiral-fluted	Standard	30.00-35.00	187	230.2	233.8	290.2	32	60	1/4"	A1 B1	105009 0080 355,-
Spiral-fluted	Standard plus	24.50-35.00	238	280.9	284.5	340.9	32	60	1/4"	A1 B1	105009 0085 355,-
Spiral-fluted	Extra-long	24.50-35.00	289	331.8	335.4	391.8	32	60	1/4"	A1 B1	105009 0090 380,-
Spiral-fluted	Extra-long	30.00-35.00	289	331.8	335.4	391.8	32	60	1/4"	A1 B1	105009 0100 395,-
Spiral-fluted	Ultra-long	24.50-35.00	410	452.9	456.5	512.9	32	60	1/4"	A1 B1	105009 0105 405,-
Straight-fluted	XL	24.50-35.00	511	554.1	557.7	614.1	32	60	1/4"	A1 B1	105009 0110 375,-
Straight-fluted	3XL	24.50-35.00	692	735.1	738.7	795.1	32	60	1/4"	A1 B1	105009 0120 460,-



## Series 2 holder with Morse taper shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	Shank	RCA	Thread	art.no.	€
Straight-fluted	Short	24.50-35.00	86	114.3	160.4	273.8	MT 4	3SRM	1/8"	A1 B1	105010 0010 283,-
Straight-fluted	Short	30.00-35.00	86	114.3	167.6	281	MT 4	4SRM	1/4"	A1 B1	105010 0020 302,-
Spiral-fluted	Medium-length	24.50-35.00	137	165.1	211.2	324.6	MT 4	3SRM	1/8"	A1 B1	105010 0030 307,-
Spiral-fluted	Medium-length	30.00-35.00	137	165.1	218.4	331.8	MT 4	4SRM	1/4"	A1 B1	105010 0040 330,-
Spiral-fluted	Standard	24.50-35.00	188	215.9	262	375.4	MT 4	3SRM	1/8"	A1 B1	105010 0050 334,-
Spiral-fluted	Standard	30.00-35.00	188	215.9	269.2	382.6	MT 4	4SRM	1/4"	A1 B1	105010 0060 355,-
Spiral-fluted	Extra-long	24.50-35.00	289	317.5	363.6	477	MT 4	3SRM	1/8"	A1 B1	105010 0070 380,-
Spiral-fluted	Extra-long	30.00-35.00	289	317.5	370.8	484.2	MT 4	4SRM	1/4"	A1 B1	105010 0080 405,-

## Series 2 cutting inserts

- Other quality grades and diameters available on request, some from stock.



D mm	S	HSS Super Kobalt AM200™	Carbide C1 K35 AM300™	
			art.no.	€
24.50	132	2 105541 2450 66,50	2 105547 2450 107,50	
25.00	132	2 105541 2500 66,50	2 105547 2500 107,50	
25.50	132	2 105541 2550 66,50	2 105547 2550 107,50	
26.00	132	2 105541 2600 66,50	2 105547 2600 107,50	
26.50	132	2 105541 2650 66,50	2 105547 2650 107,50	
27.00	132	2 105541 2700 66,50	2 105547 2700 107,50	
27.50	132	2 105541 2750 66,50	2 105547 2750 107,50	
28.00	132	2 105541 2800 66,50	2 105547 2800 107,50	
28.50	132	2 105541 2850 66,50	2 105547 2850 107,50	
29.00	132	2 105541 2900 66,50	2 105547 2900 107,50	
29.50	132	2 105541 2950 66,50	2 105547 2950 107,50	
30.00	132	2 105541 3000 66,50	2 105547 3000 107,50	
30.50	132	2 105541 3050 66,50	2 105547 3050 107,50	

D mm	S	HSS Super Kobalt AM200™	Carbide C1 K35 AM300™	
			art.no.	€
31.00	132	2 105541 3100 66,50	2 105547 3100 107,50	
31.50	132	2 105541 3150 66,50	2 105547 3150 107,50	
32.00	132	2 105541 3200 66,50	2 105547 3200 107,50	
32.50	132	2 105541 3250 66,50	2 105547 3250 107,50	
33.00	132	2 105541 3300 66,50	2 105547 3300 107,50	
33.50	132	2 105541 3350 66,50	2 105547 3350 107,50	
34.00	132	2 105541 3400 66,50	2 105547 3400 107,50	
34.50	132	2 105541 3450 66,50	2 105547 3450 107,50	
35.00	132	2 105541 3500 66,50	2 105547 3500 107,50	

## Spare parts

Screw	TORX PLUS
art.no.	art.no.
A1 105085 0070 3,26	B1 705145 0015 7,65

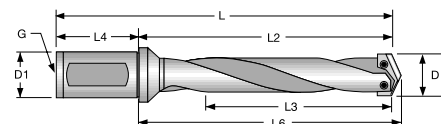


# Drilling system T-A® Series 3



- Internal coolant supply
- \* Holders also have a 1/4 inch coolant supply connection on the side

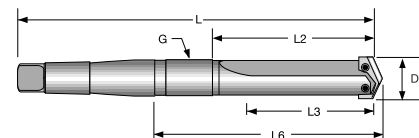
material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	● very well suited ○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS		GGG	<30 HRc	≥30 HRc	<8% Si			≥8% Si	<55 HRc
		●	●	●	○	○		○	○	○	○	○	○	●			



## Series 3 holder with straight shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread			art.no.	€
Straight-fluted	Extra-short	36.00-47.00	76.2	125	129.8	195	40	70	1/4" *	A1	B1	105011 0010	355,-
Straight-fluted	Short	36.00-47.00	121	173	177.8	243	40	70	1/4"	A1	B1	105011 0020	307,-
Spiral-fluted	Medium-length	36.00-47.00	165	217.5	222.3	287.5	40	70	1/4"	A1	B1	105011 0030	415,-
Spiral-fluted	Standard	36.00-47.00	210	261.9	266.7	331.9	40	70	1/4"	A1	B1	105011 0040	430,-
Straight-fluted	Extra-long	36.00-47.00	349.3	401.6	406.4	471.6	40	70	1/4"	A1	B1	105011 0050	470,-
Straight-fluted	XL	36.00-47.00	558.8	611.1	615.9	681.1	40	70	1/4"	A1	B1	105011 0060	539,-
Straight-fluted	3XL	36.00-47.00	787.4	839.7	844.5	909.7	40	70	1/4"	A1	B1	105011 0070	659,-

1141



## Series 3 holder with Morse taper shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	Shank	RCA	Thread			art.no.	€
Straight-fluted	Short	36.00-47.00	121	152.4	206.4	319.1	MT 4	4SRM	1/4"	A1	B1	105012 0010	302,-
Spiral-fluted	Medium-length	36.00-47.00	165	196.9	250.9	363.6	MT 4	4SRM	1/4"	A1	B1	105012 0020	405,-
Spiral-fluted	Standard	36.00-47.00	210	241.3	295.3	408	MT 4	4SRM	1/4"	A1	B1	105012 0030	430,-
Straight-fluted	Extra-long	36.00-47.00	349	381	435	547	MT 4	4SRM	1/4"	A1	B1	105012 0040	440,-
Straight-fluted	XL	36.00-47.00	558.8	590.6	644.6	757.2	MT 4	4SRM	1/4"	A1	B1	105012 0050	539,-
Straight-fluted	3XL	36.00-47.00	787.4	819.2	873.2	985.8	MT 4	4SRM	1/4"	A1	B1	105012 0060	659,-

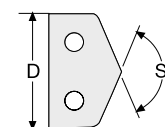
1141

## Series 3 cutting inserts

- Other quality grades and diameters available on request, some from stock.



D mm	S°	HSS Super Kobalt AM200™ art.no.	€
36.00	132	105641 3600	71,70
37.00	132	105641 3700	71,70
38.00	132	105641 3800	71,70
39.00	132	105641 3900	71,70
40.00	132	105641 4000	71,70
41.00	132	105641 4100	71,70
42.00	132	105641 4200	71,70
43.00	132	105641 4300	71,70
44.00	132	105641 4400	71,70
45.00	132	105641 4500	71,70
46.00	132	105641 4600	71,70
47.00	132	105641 4700	71,70



1142

## Spare parts

Screw		TORX PLUS	
art.no.	€	art.no.	€
A1 105085 0080	3,26	B1 705145 0020	8,15

1145

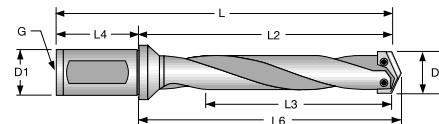
7113

# Drilling system T-A® Series 4



• Internal coolant supply

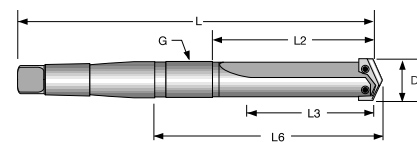
material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS		GGG	< 30 HRc	≥ 30 HRc	< 8 % Si			≥ 8 % Si	< 55 HRc	< 60 HRc
	●	●	●	○	○		○	○	○	○	○	○	○	○				



## Series 4 holder with straight shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread			art.no.	€
Straight-fluted	Short	48.00-65.00	130	179.4	184.2	249.4	40	70	1/4"	A1	B1	105013 0010	336,-
Spiral-fluted	Standard	48.00-65.00	232	281	285.8	351	40	70	1/4"	A1	B1	105013 0020	495,-
Straight-fluted	Extra-long	48.00-65.00	422	471.5	476.3	541.5	40	70	1/4"	A1	B1	105013 0030	529,-
Straight-fluted	XL	48.00-65.00	625	674.7	679.5	744.7	40	70	1/4"	A1	B1	105013 0040	629,-
Straight-fluted	3XL	48.00-65.00	879	928.7	933.5	998.7	40	70	1/4"	A1	B1	105013 0050	709,-

1141



## Series 4 holder with Morse taper shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	Shank	RCA	Thread			art.no.	€
Straight-fluted	Short	48.00-65.00	130	165.1	219.1	363.5	MT 5	5SRM	1/4"	A1	B1	105014 0010	360,-
Spiral-fluted	Standard	48.00-65.00	232	266.7	320.7	465.1	MT 5	5SRM	1/4"	A1	B1	105014 0020	499,-
Straight-fluted	Extra-long	48.00-65.00	422	457	511.2	655.6	MT 5	5SRM	1/4"	A1	B1	105014 0030	499,-
Straight-fluted	XL	48.00-65.00	625	660.4	714.4	858.8	MT 5	5SRM	1/4"	A1	B1	105014 0040	639,-
Straight-fluted	3XL	48.00-65.00	879	914.4	968.4	1112.8	MT 5	5SRM	1/4"	A1	B1	105014 0050	709,-

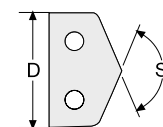
1141

## Series 4 cutting inserts

• Other quality grades and diameters available on request, some from stock.



D mm	S	HSS Super Kobalt AM200™ art.no.	€
48.00	132	105716 4800	90,40
49.00	132	105716 4900	90,40
50.00	132	105716 5000	90,40
51.00	132	105716 5100	90,40
52.00	132	105716 5200	90,40
53.00	132	105716 5300	90,40
54.00	132	105716 5400	90,40
55.00	132	105716 5500	90,40
56.00	132	105716 5600	90,40
57.00	132	105716 5700	90,40
58.00	132	105716 5800	90,40
59.00	132	105716 5900	90,40
60.00	132	105716 6000	90,40
61.00	132	105716 6100	90,40
62.00	132	105716 6200	90,40
63.00	132	105716 6300	90,40
64.00	132	105716 6400	90,40
65.00	132	105716 6500	90,40



1142

## Spare parts

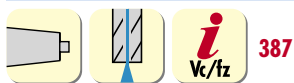
Screw			TORX PLUS		
art.no.	€		art.no.	€	
A1 105085 0080	3,26		B1 705145 0020	8,15	

1145

7113



# Drilling system T-A® Series 5/6 and 7/8



• Internal coolant supply

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GR7/EP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	○	○		○	○	○	○	○	○	○	○				



## Series 5/6 holder with Morse taper shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	Shank	RCA	Thread			art.no.	€
Straight-fluted	Short	64.00-88.00	172	215.9	287.3	430.2	MT 5	6SRM	1/2"	A1	B1	105016 0010	529,-
Spiral-fluted	Standard	64.00-88.00	273	317.5	388.9	531.8	MT 5	6SRM	1/2"	A1	B1	105016 0020	759,-
Straight-fluted	Extra-long	64.00-88.00	464	508	579.4	722.3	MT 5	6SRM	1/2"	A1	B1	105016 0030	809,-
Straight-fluted	XL	64.00-88.00	660	704.8	776.2	919.1	MT 5	6SRM	1/2"	A1	B1	105016 0040	919,-

1141

## Series 7/8 holder with Morse taper shank

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	Shank	RCA	Thread			art.no.	€
Straight-fluted	Short	90.00-114.00	172	225.4	296.8	439.7	MT 5	6SRM	1/2"	A1	B1	105017 0010	709,-
Spiral-fluted	Standard	90.00-114.00	273	327	398.5	541.3	MT 5	6SRM	1/2"	A1	B1	105017 0020	989,-
Straight-fluted	Extra-long	90.00-114.00	556	610	681	823.9	MT 5	6SRM	1/2"	A1	B1	105017 0030	1.159,-
Straight-fluted	XL	90.00-114.00	685	739.7	811.2	954	MT 5	6SRM	1/2"	A1	B1	105017 0040	1.369,-

1141

## Series 5 cutting inserts

• Other quality grades and diameters available on request, some from stock.

D mm	S	HSS Super Kobalt AM200™	art.no.	€
64.00	144	105765 6400	127,-	
66.00	144	105765 6600	127,-	
68.00	144	105765 6800	127,-	
70.00	144	105765 7000	127,-	
72.00	144	105765 7200	127,-	
74.00	144	105765 7400	127,-	
76.00	144	105765 7600	127,-	

1142

## Series 7 cutting inserts

• Other quality grades and diameters available on request, some from stock.

D mm	S	HSS Super Kobalt AM200™	art.no.	€
90.00	144	105860 9000	165,-	
92.00	144	105860 9200	165,-	
94.00	144	105860 9400	165,-	
96.00	144	105860 9600	165,-	
98.00	144	105860 9800	165,-	
100.00	144	105860 0000	165,-	

1142

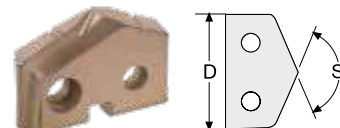
## Spare parts

Screw			TORX PLUS		
art.no.	€		art.no.	€	
A1 105085 0090	4,07		B1 705145 0025	8,40	

1145

7113

GEN2 T-A



## Series 6 cutting inserts

• Other quality grades and diameters available on request, some from stock.

D mm	S	HSS Super Kobalt AM200™	art.no.	€
78.00	144	105810 7800	140,50	
80.00	144	105810 8000	140,50	
82.00	144	105810 8200	140,50	
84.00	144	105810 8400	140,50	
86.00	144	105810 8600	140,50	
88.00	144	105810 8800	140,50	

1142

## Series 8 cutting inserts

• Other quality grades and diameters available on request, some from stock.

D mm	S	HSS Super Kobalt AM200™	art.no.	€
102.00	144	105910 0200	186,-	
104.00	144	105910 0400	186,-	
106.00	144	105910 0600	186,-	
108.00	144	105910 0800	186,-	
110.00	144	105910 1000	186,-	
112.00	144	105910 1200	186,-	
114.00	144	105910 1400	186,-	

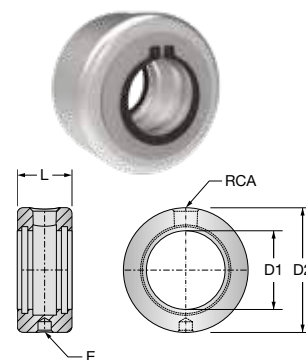
1142

**Coolant adapter**

- Coolant ring, 2 O-ring seals, 2 retaining rings, 2 thrust washers

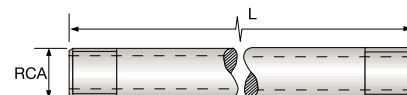
Holding fixtures	D1 mm	D2 mm	L mm	E mm	RCA	Designation	art.no.	€
MT 2	19.05	44.45	22.23	M 8	1/8"	2SRM	<b>105050 0010</b>	<b>59,30</b>
MT 3	25,4	53.97	28.57	M 8	1/8"	3SRM	105050 0020	<b>65,60</b>
MT 4	31.75	63,5	34.92	M10	1/4"	4SRM	105050 0030	<b>79,40</b>
MT 5	44.45	76,2	34.92	M10	1/4"	5SRM	105050 0040	<b>90,80</b>
MT 5	57.15	95.27	44.45	M12	1/2"	6SRM	105050 0050	<b>110,-</b>

1145


**Coolant pipe extension/support rod**

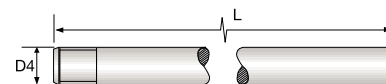
RCA	L mm	Designation	art.no.	€
1/8"	150	302T-2SRM	<b>105060 0020</b>	<b>7,45</b>
1/8"	150	302T-3SRM	105060 0030	<b>8,55</b>
1/4"	200	302T-4SRM	105060 0040	<b>8,55</b>
1/4"	200	302T-5SRM	105060 0050	<b>9,20</b>
1/2"	200	302T-6SRM	105060 0060	<b>15,40</b>

1145


**Support rod, solid**

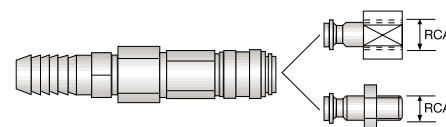
D4 mm	L mm	Designation	art.no.	€
M 8	250	312T-2SRM	<b>105065 0020</b>	<b>4,48</b>
M 8	250	312T-3SRM	105065 0030	<b>4,48</b>
M10	250	312T-4SRM	105065 0040	<b>12,85</b>
M10	250	312T-5SRM	105065 0050	<b>4,89</b>
M12	250	312T-6SRM	105065 0060	<b>8,15</b>

1145


**Quick coupling**

RCA	Hose connector Ø mm	Designation	art.no.	€
1/8"	9	322T-2SRM	<b>105070 0020</b>	<b>56,50</b>
1/8"	9	322T-3SRM	105070 0030	<b>56,50</b>
1/4"	9	322T-4SRM	105070 0040	<b>56,50</b>
1/4"	12	322T-5SRM	105070 0050	<b>56,50</b>
1/2"	12	322T-6SRM	105070 0060	<b>82,-</b>

1145



Ground sharp ...

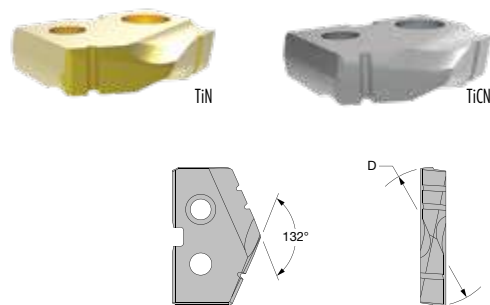
... optimal chip control.

**ATORN**<sup>®</sup>  
 Performance demands quality

# IMB Cutting inserts T-A® Original

HSS
TiN
TiCN
**i** Vc/tz 385

- Diameter 9.5 - 65mm
- suitable for carrier tools T-A® Original, series Y to 4
- **Cutting material: HSS Super Cobalt, TiN/TiCN-coated**
- Universal geometry with a wide range of applications
- **Recommendation:** TiCN variant for applications in stainless steel



material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys		superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	> 700 N/mm²	< 1000 N/mm²	1000-1400 N/mm²	> 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8% Si	≥ 8% Si	Cu-alloy	ERP/EPF/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC		
105100....	●	○	●	●	●	○	○	○	○	○	○	○	○	○	○	○					
105102....	●	○	●	●	●	○	○	○	○	○	○	○	○	○	○	○					

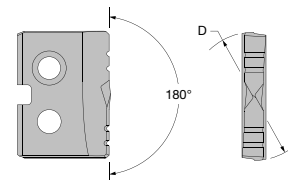
D mm	Holder	☒	NEW TiN		NEW TiCN	
			art.no.	€	art.no.	€
9.5	Series Y	2	105100 0950	26,90	2 105102 0950	32,30
10	Series Y	2	105100 1000	26,90	2 105102 1000	32,30
10.2	Series Y	2	105100 1020	26,90	2 105102 1020	32,30
10.5	Series Y	2	105100 1050	26,90	2 105102 1050	32,30
10.8	Series Y	2	105100 1080	26,90	2 105102 1080	32,30
11	Series Y	2	105100 1100	26,90	2 105102 1100	32,30
11.5	Series Z	2	105200 1150	26,90	2 105202 1150	32,30
12	Series Z	2	105200 1200	26,90	2 105202 1200	32,30
12.5	Series Z	2	105200 1250	26,90	2 105202 1250	32,30
13	Series 0	2	105300 1300	29,10	2 105302 1300	34,40
13.5	Series 0	2	105300 1350	29,10	2 105302 1350	34,40
14	Series 0	2	105300 1400	29,10	2 105302 1400	34,40
14.5	Series 0	2	105300 1450	29,10	2 105302 1450	34,40
15	Series 0	2	105300 1500	29,10	2 105302 1500	34,40
15.5	Series 0	2	105300 1550	29,10	2 105302 1550	34,40
16	Series 0	2	105300 1600	29,10	2 105302 1600	34,40
16.5	Series 0	2	105300 1650	29,10	2 105302 1650	34,40
17	Series 0	2	105300 1700	29,10	2 105302 1700	34,40
17.5	Series 0	2	105300 1750	29,10	2 105302 1750	34,40
18	Series 1	2	105405 1800	33,30	2 105407 1800	38,70
18.5	Series 1	2	105405 1850	33,30	2 105407 1850	38,70
19	Series 1	2	105405 1900	33,30	2 105407 1900	38,70
19.5	Series 1	2	105405 1950	33,30	2 105407 1950	38,70
20	Series 1	2	105405 2000	33,30	2 105407 2000	38,70
20.5	Series 1	2	105405 2050	33,30	2 105407 2050	38,70
21	Series 1	2	105405 2100	33,30	2 105407 2100	38,70
22	Series 1	2	105405 2200	33,30	2 105407 2200	38,70
22.5	Series 1	2	105405 2250	33,30	2 105407 2250	38,70
23	Series 1	2	105405 2300	33,30	2 105407 2300	38,70
23.5	Series 1	2	105405 2350	33,30	2 105407 2350	38,70
24	Series 1	2	105405 2400	33,30	2 105407 2400	38,70
24.5	Series 2	2	105505 2450	38,20	2 105507 2450	44,70
25	Series 2	2	105505 2500	38,20	2 105507 2500	44,70
25.5	Series 2	2	105505 2550	38,20	2 105507 2550	44,70
26	Series 2	2	105505 2600	38,20	2 105507 2600	44,70
26.5	Series 2	2	105505 2650	38,20	2 105507 2650	44,70
27	Series 2	2	105505 2700	38,20	2 105507 2700	44,70
27.5	Series 2	2	105505 2750	38,20	2 105507 2750	44,70
28	Series 2	2	105505 2800	38,20	2 105507 2800	44,70
29	Series 2	2	105505 2900	38,20	2 105507 2900	44,70
29.5	Series 2	2	105505 2950	38,20	2 105507 2950	44,70
			1142		1142	

D mm	Holder	☒	NEW TiN		NEW TiCN	
			art.no.	€	art.no.	€
30	Series 2	2	105505 3000	38,20	2 105507 3000	44,70
30.5	Series 2	2	105505 3050	38,20	2 105507 3050	44,70
31	Series 2	2	105505 3100	38,20	2 105507 3100	44,70
31.5	Series 2	2	105505 3150	38,20	2 105507 3150	44,70
32	Series 2	2	105505 3200	38,20	2 105507 3200	44,70
32.5	Series 2	2	105505 3250	38,20	2 105507 3250	44,70
33	Series 2	2	105505 3300	38,20	2 105507 3300	44,70
33.5	Series 2	2	105505 3350	38,20	2 105507 3350	44,70
34	Series 2	2	105505 3400	38,20	2 105507 3400	44,70
35	Series 2	2	105505 3500	38,20	2 105507 3500	44,70
36	Series 3	2	105605 3600	48,90	2 105607 3600	57,20
37	Series 3	2	105605 3700	48,90	2 105607 3700	57,20
38	Series 3	2	105605 3800	48,90	2 105607 3800	57,20
39	Series 3	2	105605 3900	48,90	2 105607 3900	57,20
40	Series 3	2	105605 4000	48,90	2 105607 4000	57,20
41	Series 3	2	105605 4100	48,90	2 105607 4100	57,20
42	Series 3	2	105605 4200	48,90	2 105607 4200	57,20
43	Series 3	2	105605 4300	48,90	2 105607 4300	57,20
44	Series 3	2	105605 4400	48,90	2 105607 4400	57,20
45	Series 3	2	105605 4500	48,90	2 105607 4500	57,20
46	Series 3	2	105605 4600	48,90	2 105607 4600	57,20
47	Series 3	2	105605 4700	48,90	2 105607 4700	57,20
48	Series 4	1	105705 4800	62,-	1 105707 4800	71,60
49	Series 4	1	105705 4900	62,-	1 105707 4900	71,60
50	Series 4	1	105705 5000	62,-	1 105707 5000	71,60
51	Series 4	1	105705 5100	62,-	1 105707 5100	71,60
52	Series 4	1	105705 5200	62,-	1 105707 5200	71,60
53	Series 4	1	105705 5300	62,-	1 105707 5300	71,60
54	Series 4	1	105705 5400	62,-	1 105707 5400	71,60
55	Series 4	1	105705 5500	62,-	1 105707 5500	71,60
56	Series 4	1	105705 5600	62,-	1 105707 5600	71,60
57	Series 4	1	105705 5700	62,-	1 105707 5700	71,60
58	Series 4	1	105705 5800	62,-	1 105707 5800	71,60
59	Series 4	1	105705 5900	62,-	1 105707 5900	71,60
60	Series 4	1	105705 6000	62,-	1 105707 6000	71,60
61	Series 4	1	105705 6100	62,-	1 105707 6100	71,60
62	Series 4	1	105705 6200	62,-	1 105707 6200	71,60
63	Series 4	1	105705 6300	62,-	1 105707 6300	71,60
64	Series 4	1	105705 6400	62,-	1 105707 6400	71,60
65	Series 4	1	105705 6500	62,-	1 105707 6500	71,60
			1142		1142	

# IM Cutting inserts T-A® Original Flat Bottom 180°

HSS
TiN
*i* Vc/fz 385

- Diameter 9.5-65 mm
- For producing a flat-bottomed bore in existing bore
- Suitable for carrier tools T-A® Original, series Y to 4
- Also suitable for flat countersinks (only with short holder)
- Cutting material: HSS Super Cobalt, TiN-coated



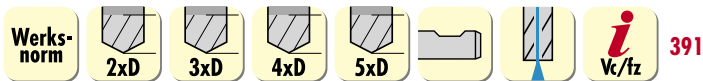
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	○	○		○	○	○	○	○	○	○	○				

D mm	Holder	☒	art.no.	€
9.5	Series Y	2	105125 0950	44,70
10	Series Y	2	105125 1000	44,70
10.2	Series Y	2	105125 1020	44,70
10.5	Series Y	2	105125 1050	44,70
10.8	Series Y	2	105125 1080	44,70
11	Series Y	2	105125 1100	44,70
11.5	Series Z	2	105225 1150	44,70
12	Series Z	2	105225 1200	44,70
12.5	Series Z	2	105225 1250	44,70
13	Series 0	2	105325 1300	48,90
13.5	Series 0	2	105325 1350	48,90
14	Series 0	2	105325 1400	48,90
14.5	Series 0	2	105325 1450	48,90
15	Series 0	2	105325 1500	48,90
15.5	Series 0	2	105325 1550	48,90
16	Series 0	2	105325 1600	48,90
16.5	Series 0	2	105325 1650	48,90
17	Series 0	2	105325 1700	48,90
17.5	Series 0	2	105325 1750	48,90
18	Series 1	2	105430 1800	54,50
18.5	Series 1	2	105430 1850	54,50
19	Series 1	2	105430 1900	54,50
19.5	Series 1	2	105430 1950	54,50
20	Series 1	2	105430 2000	54,50
20.5	Series 1	2	105430 2050	54,50
21	Series 1	2	105430 2100	54,50
21.5	Series 1	2	105430 2150	54,50
22	Series 1	2	105430 2200	54,50
22.5	Series 1	2	105430 2250	54,50
23	Series 1	2	105430 2300	54,50
23.5	Series 1	2	105430 2350	54,50
24	Series 1	2	105430 2400	54,50
24.5	Series 2	2	105530 2450	62,70
25	Series 2	2	105530 2500	62,70
25.5	Series 2	2	105530 2550	62,70
26	Series 2	2	105530 2600	62,70
26.5	Series 2	2	105530 2650	62,70
27	Series 2	2	105530 2700	62,70
27.5	Series 2	2	105530 2750	62,70
28	Series 2	2	105530 2800	62,70
28.5	Series 2	2	105530 2850	62,70
29	Series 2	2	105530 2900	62,70

D mm	Holder	☒	art.no.	€
29.5	Series 2	2	105530 2950	62,70
30	Series 2	2	105530 3000	62,70
30.5	Series 2	2	105530 3050	62,70
31	Series 2	2	105530 3100	62,70
31.5	Series 2	2	105530 3150	62,70
32	Series 2	2	105530 3200	62,70
32.5	Series 2	2	105530 3250	62,70
33	Series 2	2	105530 3300	62,70
33.5	Series 2	2	105530 3350	62,70
34	Series 2	2	105530 3400	62,70
34.5	Series 2	2	105530 3450	62,70
35	Series 2	2	105530 3500	62,70
36	Series 3	2	105530 3600	68,30
37	Series 3	2	105530 3700	68,30
38	Series 3	2	105530 3800	68,30
39	Series 3	2	105530 3900	68,30
40	Series 3	2	105530 4000	68,30
41	Series 3	2	105530 4100	68,30
42	Series 3	2	105530 4200	68,30
43	Series 3	2	105530 4300	68,30
45	Series 3	2	105530 4500	68,30
46	Series 3	2	105530 4600	68,30
47	Series 3	2	105530 4700	68,30
48	Series 4	1	105530 4800	86,80
49	Series 4	1	105530 4900	86,80
50	Series 4	1	105530 5000	86,80
51	Series 4	1	105530 5100	86,80
52	Series 4	1	105530 5200	86,80
53	Series 4	1	105530 5300	86,80
54	Series 4	1	105530 5400	86,80
55	Series 4	1	105530 5500	86,80
56	Series 4	1	105530 5600	86,80
57	Series 4	1	105530 5700	86,80
58	Series 4	1	105530 5800	86,80
59	Series 4	1	105530 5900	86,80
60	Series 4	1	105530 6000	86,80
61	Series 4	1	105530 6100	86,80
62	Series 4	1	105530 6200	86,80
63	Series 4	1	105530 6300	86,80
64	Series 4	1	105530 6400	86,80
65	Series 4	1	105530 6500	86,80

1142

# Indexable inserts solid drill bits PHOENIX PD



- Optimised substrate geometry for increased stability, improved chip removal and reduced cutting forces
- Available in tool lengths of 2xD, 3xD, 4xD and 5xD
- Diameter 12-63mm
- Wide range of applications in steel, stainless steel, cast iron and aluminium materials
- Short chips due to additional chip breaker in the chip flute
- High efficiency thanks to 4 effective cutting edges per indexable insert
- Same indexable insert can be used as centre and periphery plate
- With internal coolant supply
- Please note: Supplied without chuck key (Torx-Plus), please order separately!

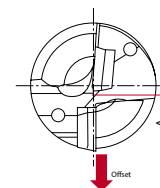
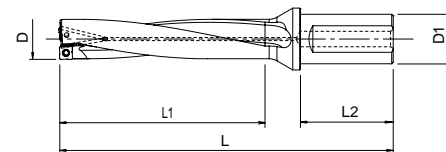
Range expanded



material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
			< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
			●	●	○	●	●	○	○	○	○	○								

## P2D - 2xD

- Bore tolerances:  
 Ø 15-20.5 mm > 0/+0.25 mm; Ø 21-49 mm > 0/+0.3 mm; Ø 50-63 mm > 0/+0.35 mm

D mm	L mm	L1 mm	L2 mm	D1 mm	A mm	D max. mm	suitable indexable inserts			art.no.	€
12	87	24	50	20	0.4	12.8	XCMT 031904ER	A1	B1	124202 0120	282,20
12.5	88	25	50	20	0.4	13.3	XCMT 031904ER	A1	B1	124202 0125	282,20
13	89	26	50	20	0.3	13.6	XCMT 031904ER	A1	B1	124202 0130	282,20
13.5	90	27	50	20	0.2	13.9	XCMT 031904ER	A1	B1	124202 0135	282,20
14	91	28	50	20	0.2	14.4	XCMT 031904ER	A1	B1	124202 0140	282,20
14.5	92	29	50	20	0.1	14.7	XCMT 031904ER	A1	B1	124202 0145	282,20
15	95	30	50	20	0.4	15.8	XCMT 042204ER	A2	B1	124202 0150	282,20
15.5	96	31	50	20	0.3	16.1	XCMT 042204ER	A2	B1	124202 0155	282,20
16	97	32	50	20	0.3	16.6	XCMT 042204ER	A2	B1	124202 0160	282,20
16.5	98	33	50	20	0.3	17.1	XCMT 042204ER	A2	B1	124202 0165	282,20
17	102	34	50	20	0.6	18.2	XCMT 052404ER	A2	B1	124202 0170	282,20
17.5	109	35	56	25	0.5	18.5	XCMT 052404ER	A2	B1	124202 0175	295,20
18	110	36	56	25	0.5	19.0	XCMT 052404ER	A2	B1	124202 0180	295,20
18.5	111	37	56	25	0.4	19.3	XCMT 052404ER	A2	B1	124202 0185	295,20
19	112	38	56	25	0.6	20.2	XCMT 062706ER	A3	B2	124202 0190	295,20
19.5	113	39	56	25	0.5	20.5	XCMT 062706ER	A3	B2	124202 0195	295,20
20	114	40	56	25	0.4	20.8	XCMT 062706ER	A3	B2	124202 0200	295,20
20.5	115	41	56	25	0.4	21.3	XCMT 062706ER	A3	B2	124202 0205	295,20
21	121	42	56	25	1.0	23.0	XCMT 073106ER	A4	B3	124202 0210	292,70
21.5	122	43	56	25	0.9	23.3	XCMT 073106ER	A4	B3	124202 0215	311,70
22	123	44	56	25	0.8	23.6	XCMT 073106ER	A4	B3	124202 0220	311,70
22.5	124	45	56	25	0.7	23.9	XCMT 073106ER	A4	B3	124202 0225	311,70
23	125	46	56	25	0.5	24.0	XCMT 073106ER	A4	B3	124202 0230	311,70
23.5	130	47	60	32	0.4	24.3	XCMT 073106ER	A4	B3	124202 0235	311,70
24	131	48	60	32	0.3	24.6	XCMT 073106ER	A4	B3	124202 0240	311,70
24.5	132	49	60	32	0.2	24.9	XCMT 073106ER	A4	B3	124202 0245	311,70
25	133	50	60	32	1.1	27.2	XCMT 083508ER	A5	B4	124202 0250	311,70
25.5	134	51	60	32	0.9	27.3	XCMT 083508ER	A5	B4	124202 0255	311,70
26	135	52	60	32	0.8	27.6	XCMT 083508ER	A5	B4	124202 0260	311,70
26.5	136	53	60	32	0.7	27.9	XCMT 083508ER	A5	B4	124202 0265	311,70
27	137	54	60	32	0.6	28.2	XCMT 083508ER	A5	B4	124202 0270	370,70
28	139	56	60	32	0.3	28.6	XCMT 083508ER	A5	B4	124202 0280	370,70
28.5	140	57	60	32	0.2	28.9	XCMT 083508ER	A5	B4	124202 0285	370,70
29	141	58	60	32	1.3	31.6	XCMT 094008ER	A5	B4	124202 0290	370,70
30	143	60	60	32	1.1	32.2	XCMT 094008ER	A5	B4	124202 0300	370,70
31	155	62	70	40	0.8	32.6	XCMT 094008ER	A5	B4	124202 0310	370,70
32	157	64	70	40	0.6	33.2	XCMT 094008ER	A5	B4	124202 0320	370,70
33	159	66	70	40	0.3	33.6	XCMT 094008ER	A5	B4	124202 0330	370,70
33.5	160	67	70	40	0.2	33.9	XCMT 094008ER	A5	B4	124202 0335	411,20
34	161	68	70	40	1.1	36.2	XCMT 104608ER	A6	B5	124202 0340	418,-
35	163	70	70	40	0.8	36.6	XCMT 104608ER	A6	B5	124202 0350	418,-
36	165	72	70	40	0.8	37.6	XCMT 104608ER	A6	B5	124202 0360	418,-
37	167	74	70	40	0.6	38.2	XCMT 104608ER	A6	B5	124202 0370	432,70
38	169	76	70	40	0.3	38.6	XCMT 104608ER	A6	B5	124202 0380	432,70





D mm	L mm	L1 mm	L2 mm	D1 mm	A mm	D max. mm	suitable indexable inserts			art.no.	€
39	178	78	70	40	1.0	41.0	XCMT 125010ER	A6	B5	124202 0390	468,10
40	180	80	70	40	0.9	41.8	XCMT 125010ER	A6	B5	124202 0400	468,10
41	182	82	70	40	0.8	42.6	XCMT 125010ER	A6	B5	124202 0410	468,10
42	184	84	70	40	0.6	43.2	XCMT 125010ER	A6	B5	124202 0420	468,10
43	186	86	70	40	0.5	44.0	XCMT 125010ER	A6	B5	124202 0430	468,10
44	188	88	70	40	0.3	44.6	XCMT 125010ER	A6	B5	124202 0440	468,10
45	190	90	70	40	0.9	46.8	XCMT 135212ER	A7	B6	124202 0450	502,40
46	192	92	70	40	0.8	47.6	XCMT 135212ER	A7	B6	124202 0460	502,40
47	194	94	70	40	0.7	48.4	XCMT 135212ER	A7	B6	124202 0470	502,40
48	196	96	70	40	0.5	49.0	XCMT 135212ER	A7	B6	124202 0480	502,40
49	198	98	70	40	0.3	49.6	XCMT 135212ER	A7	B6	124202 0490	502,40
50	200	100	70	40	1.1	52.2	XCMT 145612ER	A7	B6	124202 0500	557,-
51	202	102	70	40	1.0	53.0	XCMT 145612ER	A7	B6	124202 0510	557,-
52	204	104	70	40	0.8	53.6	XCMT 145612ER	A7	B6	124202 0520	557,-
53	206	106	70	40	0.7	54.4	XCMT 145612ER	A7	B6	124202 0530	557,-
54	208	108	70	40	0.6	55.2	XCMT 145612ER	A7	B6	124202 0540	557,-
55	210	110	70	40	0.4	55.8	XCMT 145612ER	A7	B6	124202 0550	557,-
56	212	112	70	40	0.1	56.2	XCMT 145612ER	A7	B6	124202 0560	557,-
57	214	114	70	40	1.1	59.2	XCMT 165912ER	A7	B6	124202 0570	572,90
58	216	116	70	40	1.0	60.0	XCMT 165912ER	A7	B6	124202 0580	572,90
59	218	118	70	40	0.9	60.8	XCMT 165912ER	A7	B6	124202 0590	572,90
60	220	120	70	40	0.8	61.6	XCMT 165912ER	A7	B6	124202 0600	572,90
61	222	122	70	40	0.6	62.2	XCMT 165912ER	A7	B6	124202 0610	572,90
62	224	124	70	40	0.4	62.8	XCMT 165912ER	A7	B6	124202 0620	572,90
63	226	126	70	40	0.2	63.4	XCMT 165912ER	A7	B6	124202 0630	572,90

1169

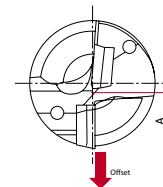
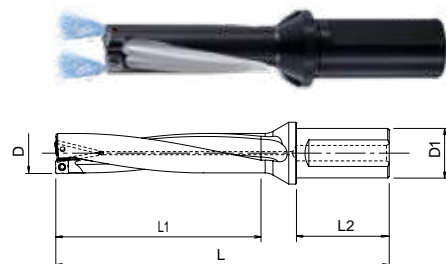
**P3D - 3xD**

• Bore tolerances:

∅ 15-20.5 mm > 0/+0.25 mm; ∅ 21-49 mm > 0/+0.3 mm; ∅ 50-63 mm > 0/+0.35 mm



D mm	L mm	L1 mm	L2 mm	D1 mm	A mm	D max. mm	suitable indexable inserts			art.no.	€
12	99	36	50	20	0.4	12.8	XCMT 031904ER	A1	B1	<b>124203 0120</b>	314,30
12.5	100.5	37.5	50	20	0.4	13.3	XCMT 031904ER	A1	B1	124203 0125	314,30
12.7	101.1	38.1	50	20	0.3	13.3	XCMT 031904ER	A1	B1	124203 0127	314,30
13	102	39	50	20	0.3	13.6	XCMT 031904ER	A1	B1	124203 0130	314,30
13.5	103.5	40.5	50	20	0.2	13.9	XCMT 031904ER	A1	B1	124203 0135	314,30
14	105	42	50	20	0.2	14.4	XCMT 031904ER	A1	B1	124203 0140	314,30
14.5	106.5	43.5	50	20	0.1	14.7	XCMT 031904ER	A1	B1	124203 0145	314,30
15	110	45	50	20	0.4	15.8	XCMT 042204ER	A2	B1	124203 0150	314,30
15.5	112	47	50	20	0.3	16.1	XCMT 042204ER	A2	B1	124203 0155	314,30
16	113	48	50	20	0.3	16.6	XCMT 042204ER	A2	B1	124203 0160	314,30
16.5	115	50	50	20	0.3	17.1	XCMT 042204ER	A2	B1	124203 0165	314,30
17	119	51	50	20	0.6	18.2	XCMT 052404ER	A2	B1	124203 0170	314,30
17.5	121	53	50	20	0.5	18.5	XCMT 052404ER	A2	B1	124203 0175	314,30
18	128	54	56	25	0.5	19.0	XCMT 052404ER	A2	B1	124203 0180	314,30
18.5	130	56	56	25	0.4	19.3	XCMT 052404ER	A2	B1	124203 0185	314,30
19	131	57	56	25	0.6	20.2	XCMT 062706ER	A3	B2	124203 0190	314,30
19.5	133	59	56	25	0.5	20.5	XCMT 062706ER	A3	B2	124203 0195	314,30
20	134	60	56	25	0.4	20.8	XCMT 062706ER	A3	B2	124203 0200	314,30
20.5	136	62	56	25	0.4	21.3	XCMT 062706ER	A3	B2	124203 0205	314,30
21	142	63	56	25	1.0	23.0	XCMT 073106ER	A4	B3	124203 0210	328,90
21.5	144	65	56	25	0.9	23.3	XCMT 073106ER	A4	B3	124203 0215	328,90
22	145	66	56	25	0.8	23.6	XCMT 073106ER	A4	B3	124203 0220	328,90
22.5	147	68	56	25	0.7	23.9	XCMT 073106ER	A4	B3	124203 0225	328,90
23	148	69	56	25	0.5	24.0	XCMT 073106ER	A4	B3	124203 0230	345,-
23.5	154	71	60	32	0.4	24.3	XCMT 073106ER	A4	B3	124203 0235	345,-
24	155	72	60	32	0.3	24.6	XCMT 073106ER	A4	B3	124203 0240	345,-
24.5	157	74	60	32	0.2	24.9	XCMT 073106ER	A4	B3	124203 0245	345,-
25	158	75	60	32	1.1	27.2	XCMT 083508ER	A5	B4	124203 0250	345,-
25.5	160	77	60	32	0.9	27.3	XCMT 083508ER	A5	B4	124203 0255	345,-
26	161	78	60	32	0.8	27.6	XCMT 083508ER	A5	B4	124203 0260	390,90
26.5	163	80	60	32	0.7	27.9	XCMT 083508ER	A5	B4	124203 0265	390,90

1169



Continued on next page >>>





D mm	L mm	L1 mm	L2 mm	D1 mm	A mm	D max. mm	suitable indexable inserts			art.no.	€
27	164	81	60	32	0.6	28.2	XCMT 083508ER	A5	B4	124203 0270	390,90
28	167	84	60	32	0.3	28.6	XCMT 083508ER	A5	B4	124203 0280	390,90
28.5	169	86	60	32	0.2	28.9	XCMT 083508ER	A5	B4	124203 0285	390,90
29	170	87	60	32	1.3	31.6	XCMT 094008ER	A5	B4	124203 0290	390,90
30	173	90	60	32	1.1	32.2	XCMT 094008ER	A5	B4	124203 0300	390,90
31	186	93	70	40	0.8	32.6	XCMT 094008ER	A5	B4	124203 0310	434,-
32	189	96	70	40	0.6	33.2	XCMT 094008ER	A5	B4	124203 0320	434,-
33	192	99	70	40	0.3	33.6	XCMT 094008ER	A5	B4	124203 0330	434,-
33.5	194	101	70	40	0.2	33.9	XCMT 094008ER	A5	B4	124203 0335	434,-
34	195	102	70	40	1.1	36.2	XCMT 104608ER	A6	B5	124203 0340	440,20
35	198	105	70	40	0.8	36.6	XCMT 104608ER	A6	B5	124203 0350	440,20
36	201	108	70	40	0.8	37.6	XCMT 104608ER	A6	B5	124203 0360	440,20
37	204	111	70	40	0.6	38.2	XCMT 104608ER	A6	B5	124203 0370	459,60
38	207	114	70	40	0.3	38.6	XCMT 104608ER	A6	B5	124203 0380	459,60
39	217	117	70	40	1.0	41.0	XCMT 125010ER	A6	B5	124203 0390	497,80
40	220	120	70	40	0.9	41.8	XCMT 125010ER	A6	B5	124203 0400	497,80
41	223	123	70	40	0.8	42.6	XCMT 125010ER	A6	B5	124203 0410	497,80
42	226	126	70	40	0.6	43.2	XCMT 125010ER	A6	B5	124203 0420	497,80
43	229	129	70	40	0.5	44.0	XCMT 125010ER	A6	B5	124203 0430	497,80
44	232	132	70	40	0.3	44.6	XCMT 125010ER	A6	B5	124203 0440	497,80
45	235	135	70	40	0.9	46.8	XCMT 135212ER	A7	B6	124203 0450	543,60
46	238	138	70	40	0.8	47.6	XCMT 135212ER	A7	B6	124203 0460	543,60
47	241	141	70	40	0.7	48.4	XCMT 135212ER	A7	B6	124203 0470	543,60
48	244	144	70	40	0.5	49.0	XCMT 135212ER	A7	B6	124203 0480	543,60
49	247	147	70	40	0.3	49.6	XCMT 135212ER	A7	B6	124203 0490	543,60
50	250	150	70	40	1.1	52.2	XCMT 145612ER	A7	B6	124203 0500	602,-
51	253	153	70	40	1.0	53.0	XCMT 145612ER	A7	B6	124203 0510	602,-
52	256	156	70	40	0.8	53.6	XCMT 145612ER	A7	B6	124203 0520	602,-
53	259	159	70	40	0.7	55.4	XCMT 145612ER	A7	B6	124203 0530	602,-
54	262	162	70	40	0.6	55.2	XCMT 145612ER	A7	B6	124203 0540	602,-
55	265	165	70	40	0.4	55.8	XCMT 145612ER	A7	B6	124203 0550	602,-
56	268	168	70	40	0.1	56.2	XCMT 145612ER	A7	B6	124203 0560	602,-
57	271	171	70	40	1.1	59.2	XCMT 165912ER	A7	B6	124203 0570	617,10
58	274	174	70	40	1.0	60.0	XCMT 165912ER	A7	B6	124203 0580	617,10
59	277	177	70	40	0.9	60.8	XCMT 165912ER	A7	B6	124203 0590	617,10
60	280	180	70	40	0.8	61.6	XCMT 165912ER	A7	B6	124203 0600	617,10
61	283	183	70	40	0.6	62.2	XCMT 165912ER	A7	B6	124203 0610	617,10
62	286	186	70	40	0.4	62.8	XCMT 165912ER	A7	B6	124203 0620	617,10
63	289	189	70	40	0.2	63.4	XCMT 165912ER	A7	B6	124203 0630	617,10

1169

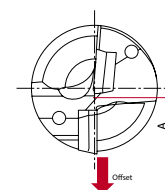
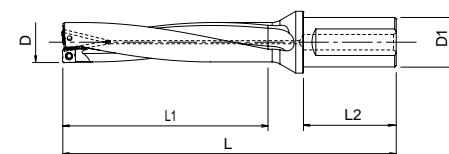
**P4D - 4xD**



- Bore tolerances:

∅ 15-20.5 mm > 0/+0.3 mm; ∅ 21-49 mm > 0/+0.4 mm; ∅ 50-63 mm > 0/+0.5 mm

D mm	L mm	L1 mm	L2 mm	D1 mm	A mm	D max. mm	suitable indexable inserts			art.no.	€
12	111	48	50	20	0.4	12.8	XCMT 031904ER	A1	B1	124204 0120	474,30
12.5	113	50	50	20	0.4	13.3	XCMT 031904ER	A1	B1	124204 0125	474,30
13	115	52	50	20	0.3	13.6	XCMT 031904ER	A1	B1	124204 0130	474,30
13.5	117	54	50	20	0.2	13.9	XCMT 031904ER	A1	B1	124204 0135	474,30
14	119	56	50	20	0.2	14.4	XCMT 031904ER	A1	B1	124204 0140	474,30
14.5	121	58	50	20	0.1	14.7	XCMT 031904ER	A1	B1	124204 0145	474,30
15	125	60	50	20	0.4	15.8	XCMT 042204ER	A2	B1	124204 0150	474,30
15.5	127	62	50	20	0.3	16.1	XCMT 042204ER	A2	B1	124204 0155	474,30
16	129	64	50	20	0.3	16.6	XCMT 042204ER	A2	B1	124204 0160	474,30
16.5	131	66	50	20	0.3	17.1	XCMT 042204ER	A2	B1	124204 0165	474,30
17	136	68	50	20	0.6	18.2	XCMT 052404ER	A2	B1	124204 0170	498,40
17.5	138	70	50	20	0.5	18.5	XCMT 052404ER	A2	B1	124204 0175	498,40
18	146	72	56	25	0.5	19.0	XCMT 052404ER	A2	B1	124204 0180	498,40
18.5	148	74	56	25	0.4	19.3	XCMT 052404ER	A2	B1	124204 0185	498,40
19	150	76	56	25	0.6	20.2	XCMT 062706ER	A3	B2	124204 0190	517,10

1169



D mm	L mm	L1 mm	L2 mm	D1 mm	A mm	D max. mm	suitable indexable inserts			art.no.	€
19.5	152	78	56	25	0.5	20.5	XCMT 062706ER	A3	B2	124204 0195	517,10
20	154	80	56	25	0.4	20.8	XCMT 062706ER	A3	B2	124204 0200	517,10
20.5	156	82	56	25	0.4	21.3	XCMT 062706ER	A3	B2	124204 0205	517,10
21	163	84	56	25	1.0	23.0	XCMT 073106ER	A4	B3	124204 0210	467,80
21.5	165	86	56	25	0.9	23.3	XCMT 073106ER	A4	B3	124204 0215	467,80
22	167	88	56	25	0.8	23.6	XCMT 073106ER	A4	B3	124204 0220	467,80
22.5	169	90	56	25	0.7	23.9	XCMT 073106ER	A4	B3	124204 0225	467,80
23	171	92	56	25	0.5	24.0	XCMT 073106ER	A4	B3	124204 0230	467,80
23.5	177	94	60	32	0.4	24.3	XCMT 073106ER	A4	B3	124204 0235	467,80
24	179	96	60	32	0.3	24.6	XCMT 073106ER	A4	B3	124204 0240	467,80
24.5	181	98	60	32	0.2	24.9	XCMT 073106ER	A4	B3	124204 0245	467,80
25	183	100	60	32	1.1	27.2	XCMT 083508ER	A5	B4	124204 0250	499,20
25.5	185	102	60	32	0.9	27.3	XCMT 083508ER	A5	B4	124204 0255	499,20
26	187	104	60	32	0.8	27.6	XCMT 083508ER	A5	B4	124204 0260	499,20
26.5	189	106	60	32	0.7	27.9	XCMT 083508ER	A5	B4	124204 0265	499,20
27	191	108	60	32	0.6	28.2	XCMT 083508ER	A5	B4	124204 0270	499,20
28	195	112	60	32	0.3	28.6	XCMT 083508ER	A5	B4	124204 0280	499,20
28.5	197	114	60	32	0.2	28.9	XCMT 083508ER	A5	B4	124204 0285	499,20
29	199	116	60	32	1.3	31.6	XCMT 094008ER	A5	B4	124204 0290	528,50
30	203	120	60	32	1.1	32.2	XCMT 094008ER	A5	B4	124204 0300	528,50
31	207	124	60	32	0.8	32.6	XCMT 094008ER	A5	B4	124204 0310	528,50
32	211	128	60	32	0.6	33.2	XCMT 094008ER	A5	B4	124204 0320	528,50
33	225	132	70	40	0.3	33.6	XCMT 094008ER	A5	B4	124204 0330	528,50
33.5	227	134	70	40	0.2	33.9	XCMT 094008ER	A5	B4	124204 0335	528,50
34	229	136	70	40	1.1	36.2	XCMT 104608ER	A6	B5	124204 0340	536,10
35	233	140	70	40	0.8	36.6	XCMT 104608ER	A6	B5	124204 0350	536,10
36	237	144	70	40	0.8	37.6	XCMT 104608ER	A6	B5	124204 0360	536,10
37	241	148	70	40	0.6	38.2	XCMT 104608ER	A6	B5	124204 0370	557,30
38	245	152	70	40	0.3	38.6	XCMT 104608ER	A6	B5	124204 0380	557,30
39	256	156	70	40	1.0	41.0	XCMT 125010ER	A6	B5	124204 0390	567,70
40	260	160	70	40	0.9	41.8	XCMT 125010ER	A6	B5	124204 0400	628,10
41	264	164	70	40	0.8	42.6	XCMT 125010ER	A6	B5	124204 0410	628,10
42	268	168	70	40	0.6	43.2	XCMT 125010ER	A6	B5	124204 0420	628,10
43	272	172	70	40	0.5	44.0	XCMT 125010ER	A6	B5	124204 0430	628,10
44	276	176	70	40	0.3	44.6	XCMT 125010ER	A6	B5	124204 0440	628,10
45	280	180	70	40	0.9	46.8	XCMT 135212ER	A7	B6	124204 0450	661,80
46	284	184	70	40	0.8	47.6	XCMT 135212ER	A7	B6	124204 0460	661,80
47	288	188	70	40	0.7	48.4	XCMT 135212ER	A7	B6	124204 0470	661,80
48	292	192	70	40	0.5	49.0	XCMT 135212ER	A7	B6	124204 0480	661,80
49	296	196	70	40	0.3	49.6	XCMT 135212ER	A7	B6	124204 0490	661,80
50	300	200	70	40	1.1	52.2	XCMT 145612ER	A7	B6	124204 0500	736,30
51	304	204	70	40	1.0	53.0	XCMT 145612ER	A7	B6	124204 0510	736,30
52	308	208	70	40	0.8	53.6	XCMT 145612ER	A7	B6	124204 0520	736,30
53	312	212	70	40	0.7	54.4	XCMT 145612ER	A7	B6	124204 0530	736,30
54	316	216	70	40	0.6	55.2	XCMT 145612ER	A7	B6	124204 0540	736,30
55	320	220	70	40	0.4	55.8	XCMT 145612ER	A7	B6	124204 0550	736,30
56	324	224	70	40	0.1	56.2	XCMT 145612ER	A7	B6	124204 0560	736,30
57	328	228	70	40	1.1	59.2	XCMT 165912ER	A7	B6	124204 0570	755,-
58	332	232	70	40	1.0	60.0	XCMT 165912ER	A7	B6	124204 0580	755,-
59	336	236	70	40	0.9	60.8	XCMT 165912ER	A7	B6	124204 0590	755,-
60	340	240	70	40	0.8	61.6	XCMT 165912ER	A7	B6	124204 0600	755,-
61	344	244	70	40	0.6	62.2	XCMT 165912ER	A7	B6	124204 0610	755,-
62	348	248	70	40	0.4	62.8	XCMT 165912ER	A7	B6	124204 0620	755,-
63	352	252	70	40	0.2	63.4	XCMT 165912ER	A7	B6	124204 0630	755,-

1169

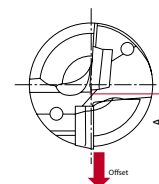
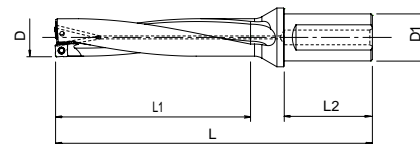
Continued on next page &gt;&gt;&gt;





**P5D - 5xD**

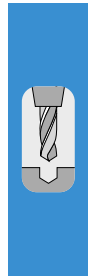
- Bore tolerances:  
 $\varnothing 15-20.5 \text{ mm} > 0/+0.3 \text{ mm}$ ;  $\varnothing 21-49 \text{ mm} > 0/+0.4 \text{ mm}$ ;  $\varnothing 50-63 \text{ mm} > 0/+0.5 \text{ mm}$

D mm	L mm	L1 mm	L2 mm	D1 mm	A mm	D max. mm	suitable indexable inserts			art.no.	€
12	123	60	50	20	0.4	12.8	XCMT 031904ER	A1	B1	<b>124205 0120</b>	<b>479,70</b>
12.5	125.5	62.5	50	20	0.4	13.3	XCMT 031904ER	A1	B1	124205 0125	<b>479,70</b>
13	128	65	50	20	0.3	13.6	XCMT 031904ER	A1	B1	124205 0130	<b>479,70</b>
13.5	130.5	67.5	50	20	0.2	13.9	XCMT 031904ER	A1	B1	124205 0135	<b>479,70</b>
14	133	70	50	20	0.2	14.4	XCMT 031904ER	A1	B1	124205 0140	<b>479,70</b>
14.5	135.5	72.5	50	20	0.1	14.7	XCMT 031904ER	A1	B1	124205 0145	<b>479,70</b>
15	140	75	50	20	0.4	15.8	XCMT 042204ER	A2	B1	124205 0150	<b>479,70</b>
15.5	143	78	50	20	0.3	16.1	XCMT 042204ER	A2	B1	124205 0155	<b>479,70</b>
16	145	80	50	20	0.3	16.6	XCMT 042204ER	A2	B1	124205 0160	<b>479,70</b>
16.5	148	83	50	20	0.3	17.1	XCMT 042204ER	A2	B1	124205 0165	<b>479,70</b>
17	153	85	50	20	0.6	18.2	XCMT 052404ER	A2	B1	124205 0170	<b>505,40</b>
17.5	156	88	50	20	0.5	18.5	XCMT 052404ER	A2	B1	124205 0175	<b>505,40</b>
18	164	90	56	25	0.5	19.0	XCMT 052404ER	A2	B1	124205 0180	<b>505,40</b>
18.5	167	93	56	25	0.4	19.3	XCMT 052404ER	A2	B1	124205 0185	<b>505,40</b>
19	169	95	56	25	0.6	20.2	XCMT 062706ER	A3	B2	124205 0190	<b>524,-</b>
19.5	172	98	56	25	0.5	20.5	XCMT 062706ER	A3	B2	124205 0195	<b>524,-</b>
20	174	100	56	25	0.4	20.8	XCMT 062706ER	A3	B2	124205 0200	<b>524,-</b>
20.5	177	103	56	25	0.4	21.3	XCMT 062706ER	A3	B2	124205 0205	<b>524,-</b>
21	184	105	56	25	1.0	23.0	XCMT 073106ER	A4	B3	124205 0210	<b>497,10</b>
21.5	187	108	56	25	0.9	23.3	XCMT 073106ER	A4	B3	124205 0215	<b>497,10</b>
22	189	110	56	25	0.8	23.6	XCMT 073106ER	A4	B3	124205 0220	<b>497,10</b>
22.5	192	113	56	25	0.7	23.9	XCMT 073106ER	A4	B3	124205 0225	<b>497,10</b>
23	194	115	56	25	0.5	24.0	XCMT 073106ER	A4	B3	124205 0230	<b>497,10</b>
23.5	201	118	60	32	0.4	24.3	XCMT 073106ER	A4	B3	124205 0235	<b>497,10</b>
24	203	120	60	32	0.3	24.6	XCMT 073106ER	A4	B3	124205 0240	<b>497,10</b>
24.5	206	123	60	32	0.2	24.9	XCMT 073106ER	A4	B3	124205 0245	<b>497,10</b>
25	208	125	60	32	1.1	27.2	XCMT 083508ER	A5	B4	124205 0250	<b>530,40</b>
25.5	211	128	60	32	0.9	27.3	XCMT 083508ER	A5	B4	124205 0255	<b>530,40</b>
26	213	130	60	32	0.8	27.6	XCMT 083508ER	A5	B4	124205 0260	<b>530,40</b>
26.5	216	133	60	32	0.7	27.9	XCMT 083508ER	A5	B4	124205 0265	<b>530,40</b>
27	218	135	60	32	0.6	28.2	XCMT 083508ER	A5	B4	124205 0270	<b>530,40</b>
28	223	140	60	32	0.3	28.6	XCMT 083508ER	A5	B4	124205 0280	<b>530,40</b>
28.5	226	143	60	32	0.2	28.9	XCMT 083508ER	A5	B4	124205 0285	<b>530,40</b>
29	228	145	60	32	1.3	31.6	XCMT 094008ER	A5	B4	124205 0290	<b>563,60</b>
30	233	150	60	32	1.1	32.2	XCMT 094008ER	A5	B4	124205 0300	<b>563,60</b>
31	238	155	60	32	0.8	32.6	XCMT 094008ER	A5	B4	124205 0310	<b>563,60</b>
32	243	160	60	32	0.6	33.2	XCMT 094008ER	A5	B4	124205 0320	<b>563,60</b>
33	258	165	70	40	0.3	33.6	XCMT 094008ER	A5	B4	124205 0330	<b>563,60</b>
33.5	261	168	70	40	0.2	33.9	XCMT 094008ER	A5	B4	124205 0335	<b>563,60</b>
34	263	170	70	40	1.1	36.2	XCMT 104608ER	A6	B5	124205 0340	<b>574,20</b>
35	268	175	70	40	0.8	36.6	XCMT 104608ER	A6	B5	124205 0350	<b>574,20</b>
36	273	180	70	40	0.8	37.6	XCMT 104608ER	A6	B5	124205 0360	<b>574,20</b>
37	278	185	70	40	0.6	38.2	XCMT 104608ER	A6	B5	124205 0370	<b>598,-</b>
38	283	190	70	40	0.3	38.6	XCMT 104608ER	A6	B5	124205 0380	<b>598,-</b>
39	295	195	70	40	1.0	41.0	XCMT 125010ER	A6	B5	124205 0390	<b>666,30</b>
40	300	200	70	40	0.9	41.8	XCMT 125010ER	A6	B5	124205 0400	<b>666,30</b>
41	305	205	70	40	0.8	42.6	XCMT 125010ER	A6	B5	124205 0410	<b>666,30</b>
42	310	210	70	40	0.6	43.2	XCMT 125010ER	A6	B5	124205 0420	<b>666,30</b>
43	315	215	70	40	0.5	44.0	XCMT 125010ER	A6	B5	124205 0430	<b>666,30</b>
44	320	220	70	40	0.3	44.6	XCMT 125010ER	A6	B5	124205 0440	<b>666,30</b>
45	325	225	70	40	0.9	46.8	XCMT 135212ER	A7	B6	124205 0450	<b>704,90</b>
46	330	230	70	40	0.8	47.6	XCMT 135212ER	A7	B6	124205 0460	<b>704,90</b>
47	335	235	70	40	0.7	48.4	XCMT 135212ER	A7	B6	124205 0470	<b>704,90</b>
48	340	240	70	40	0.5	49.0	XCMT 135212ER	A7	B6	124205 0480	<b>704,90</b>
49	345	245	70	40	0.3	49.6	XCMT 135212ER	A7	B6	124205 0490	<b>704,90</b>
50	350	250	70	40	1.1	52.2	XCMT 145612ER	A7	B6	124205 0500	<b>853,90</b>



D mm	L mm	L1 mm	L2 mm	D1 mm	A mm	D max. mm	suitable indexable inserts			art.no.	€
51	355	255	70	40	1.0	53.0	XCMT 145612ER	A7	B6	124205 0510	853,90
52	360	260	70	40	0.8	53.6	XCMT 145612ER	A7	B6	124205 0520	853,90
53	365	265	70	40	0.7	54.4	XCMT 145612ER	A7	B6	124205 0530	853,90
54	370	270	70	40	0.6	55.2	XCMT 145612ER	A7	B6	124205 0540	853,90
55	375	275	70	40	0.4	55.8	XCMT 145612ER	A7	B6	124205 0550	853,90
56	380	280	70	40	0.1	56.2	XCMT 145612ER	A7	B6	124205 0560	853,90
57	385	285	70	40	1.1	59.2	XCMT 165912ER	A7	B6	124205 0570	884,-
58	390	290	70	40	1.0	60.0	XCMT 165912ER	A7	B6	124205 0580	884,-
59	395	295	70	40	0.9	60.8	XCMT 165912ER	A7	B6	124205 0590	884,-
60	400	300	70	40	0.8	61.6	XCMT 165912ER	A7	B6	124205 0600	884,-
61	405	305	70	40	0.6	62.2	XCMT 165912ER	A7	B6	124205 0610	884,-
62	410	310	70	40	0.4	62.8	XCMT 165912ER	A7	B6	124205 0620	884,-
63	415	315	70	40	0.2	63.4	XCMT 165912ER	A7	B6	124205 0630	884,-

1169



**Indexable cutting inserts**

ISO 

ISO 

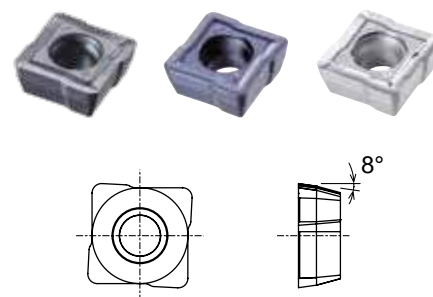
ISO 

ISO designation		<b>-DM XP9020</b> art.no.	€		<b>-DR XP1010</b> art.no.	€		<b>-DN CK110</b> art.no.	€
XCMT 031904ER	10	124210 1904	8,90	10	124211 1904	8,90	10	124212 1904	8,20
XCMT 042204ER	10	124210 2204	10,40	10	124211 2204	10,40	10	124212 2204	9,10
XCMT 052404ER	10	124210 2404	10,70	10	124211 2404	10,70	10	124212 2404	9,90
XCMT 062706ER	10	124210 2706	11,20	10	124211 2604	11,20	10	124212 2604	9,90
XCMT 073106ER	10	124210 3106	13,20	10	124211 3106	13,20	10	124212 3106	13,20
XCMT 083508ER	10	124210 3508	14,10	10	124211 3508	14,20	10	124212 3508	14,20
XCMT 094008ER	10	124210 4008	15,20	10	124211 4008	15,30	10	124212 4008	15,30
XCMT 104608ER	10	124210 4608	16,-	10	124211 4608	16,-	10	124212 4608	14,30
XCMT 125010ER	10	124210 5010	17,10	10	124211 5010	17,10	10	124212 5010	15,80
XCMT 135212ER	10	124210 5212	18,30	10	124211 5212	18,30	10	124212 5212	16,90
XCMT 145612ER	10	124210 5612	20,80	10	124211 5612	20,80	10	124212 5612	19,40
XCMT 165912ER	10	124210 5912	24,70	10	124211 5912	24,70	10	124212 5912	23,30



1170

1170

1170



**Spare parts**

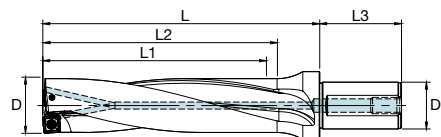
 <b>Screw</b>			 <b>TORX PLUS</b>		
	art.no.	€		art.no.	€
A1	124215 0003	7,80	B1	703054 0060	2,24
A2	124215 0004	8,20	B2	703054 0070	2,24
A3	124215 0006	7,80	B3	703054 0080	2,24
A4	124215 0007	6,60	B4	703054 0090	2,24
A5	124215 0008	5,30	B5	703054 0150	2,24
A6	124215 0010	6,20	B6	703054 0200	2,24
A7	124215 0013	6,20			

1169



7114

**palbit**  **Indexable inserts - solid drill bits SCS 3D/4D**


- Surface-hardened carrier tools
- **Available tool lengths of 3xD and 4xD**
- **Diameter 13-50 mm**
- Optimised chip space geometry and cutting edge positions for stable drilling
- Wide range of applications
- Good chip control and reduced cutting forces
- **With internal coolant supply**
- **Suitable indexable cutting inserts SPKX**


**SCS 3D - 3xD**



- Bore tolerances:  $\varnothing$  13-21.5 mm > -0.1/+0.15 mm;  $\varnothing$  22-50 mm > -0.12/+0.2 mm

Designation	D mm	L1 mm	L2 mm	L mm	D1 mm	L3 mm	suitable indexable inserts			art.no.	€
SCS 13020-3D	13	39	42	62	20	50	SPKX 050204	A6	B1	<b>124403 0130</b>	<b>194,50</b>
SCS 13520-3D	13.5	41	44	64	20	50	SPKX 050204	A6	B1	124403 0135	194,50
SCS 14020-3D	14	42	45	65	20	50	SPKX 050204	A6	B1	124403 0140	194,50
SCS 14520-3D	14.5	44	47	67	20	50	SPKX 050204	A6	B1	124403 0145	194,50
SCS 15020-3D	15	45	48	68	20	50	SPKX 050204	A6	B1	124403 0150	194,50
SCS 15525-3D	15.5	47	50	75	25	56	SPKX 060204	A1	B2	124403 0155	194,50
SCS 16025-3D	16	48	51	76	25	56	SPKX 060204	A1	B2	124403 0160	194,50
SCS 16525-3D	16.5	50	53	78	25	56	SPKX 060204	A1	B2	124403 0165	194,50
SCS 17025-3D	17	51	54	79	25	56	SPKX 060204	A1	B2	124403 0170	194,50
SCS 17525-3D	17.5	53	56	81	25	56	SPKX 060204	A1	B2	124403 0175	194,50
SCS 18025-3D	18	54	57	82	25	56	SPKX 060204	A1	B2	124403 0180	194,50
SCS 18525-3D	18.5	56	59	84	25	56	SPKX 060204	A1	B2	124403 0185	194,50
SCS 19025-3D	19	57	60	85	25	56	SPKX 060204	A1	B2	124403 0190	194,50
SCS 19525-3D	19.5	59	62	87	25	56	SPKX 060204	A1	B2	124403 0195	194,50
SCS 20025-3D	20	60	63	88	25	56	SPKX 060204	A1	B2	124403 0200	194,50
SCS 20525-3D	20.5	62	65	90	25	56	SPKX 060204	A1	B2	124403 0205	194,50
SCS 21025-3D	21	63	66	91	25	56	SPKX 060204	A1	B2	124403 0210	194,50
SCS 21525-3D	21.5	65	68	93	25	56	SPKX 060204	A1	B2	124403 0215	196,50
SCS 22032-3D	22	66	69	99	32	60	SPKX 07T308	A2	B3	124403 0220	196,50
SCS 22532-3D	22.5	68	71	101	32	60	SPKX 07T308	A2	B3	124403 0225	196,50
SCS 23032-3D	23	69	72	102	32	60	SPKX 07T308	A2	B3	124403 0230	196,50
SCS 23532-3D	23.5	71	74	104	32	60	SPKX 07T308	A2	B3	124403 0235	196,50
SCS 24032-3D	24	72	75	105	32	60	SPKX 07T308	A2	B3	124403 0240	196,50
SCS 24532-3D	24.5	74	77	107	32	60	SPKX 07T308	A2	B3	124403 0245	196,50
SCS 25032-3D	25	75	78	108	32	60	SPKX 07T308	A2	B3	124403 0250	196,50
SCS 25532-3D	25.5	77	80	110	32	60	SPKX 07T308	A2	B3	124403 0255	210,-
SCS 26032-3D	26	78	81	111	32	60	SPKX 07T308	A2	B3	124403 0260	210,-
SCS 26532-3D	26.5	80	83	113	32	60	SPKX 07T308	A2	B3	124403 0265	210,-
SCS 27032-3D	27	81	84	114	32	60	SPKX 07T308	A2	B3	124403 0270	210,-
SCS 27532-3D	27.5	83	86	116	32	60	SPKX 07T308	A2	B3	124403 0275	210,-
SCS 28032-3D	28	84	87	117	32	60	SPKX 090408	A3	B4	124403 0280	210,-
SCS 28532-3D	28.5	86	89	119	32	60	SPKX 090408	A3	B4	124403 0285	210,-
SCS 29032-3D	29	87	90	120	32	60	SPKX 090408	A3	B4	124403 0290	210,-
SCS 29532-3D	29.5	89	93	123	32	60	SPKX 090408	A3	B4	124403 0295	210,-
SCS 30032-3D	30	90	95	125	32	60	SPKX 090408	A3	B4	124403 0300	210,-
SCS 31032-3D	31	93	98	128	32	60	SPKX 090408	A3	B4	124403 0310	238,-
SCS 32032-3D	32	96	101	131	32	60	SPKX 090408	A3	B4	124403 0320	243,-
SCS 33032-3D	33	99	104	134	32	60	SPKX 090408	A3	B4	124403 0330	243,-
SCS 34040-3D	34	102	107	142	40	70	SPKX 110408	A4	B4	124403 0340	243,-
SCS 35040-3D	35	105	110	145	40	70	SPKX 110408	A4	B4	124403 0350	243,-
SCS 36040-3D	36	108	113	148	40	70	SPKX 110408	A4	B4	124403 0360	243,-
SCS 37040-3D	37	111	116	151	40	70	SPKX 110408	A4	B4	124403 0370	250,-
SCS 38040-3D	38	114	119	154	40	70	SPKX 110408	A4	B4	124403 0380	250,-
SCS 39040-3D	39	117	122	157	40	70	SPKX 110408	A4	B4	124403 0390	250,-
SCS 40040-3D	40	120	125	160	40	70	SPKX 110408	A4	B4	124403 0400	250,-
SCS 41040-3D	41	123	128	163	40	70	SPKX 110408	A4	B4	124403 0410	275,-
SCS 42040-3D	42	126	131	166	40	70	SPKX 140512	A5	B5	124403 0420	275,-

1173





Designation	D mm	L1 mm	L2 mm	L mm	D1 mm	L3 mm	suitable indexable inserts			art.no.	€
SCS 44040-4D	44	176	181	216	40	70	SPKX 140512	A5	B5	124404 0440	304,-
SCS 45040-4D	45	180	185	220	40	70	SPKX 140512	A5	B5	124404 0450	304,-
SCS 46040-4D	46	184	189	224	40	70	SPKX 140512	A5	B5	124404 0460	320,-
SCS 47040-4D	47	188	193	228	40	70	SPKX 140512	A5	B5	124404 0470	320,-
SCS 48040-4D	48	192	197	232	40	70	SPKX 140512	A5	B5	124404 0480	320,-
SCS 49040-4D	49	196	201	236	40	70	SPKX 140512	A5	B5	124404 0490	320,-
SCS 50040-4D	50	200	205	240	40	70	SPKX 140512	A5	B5	124404 0500	320,-

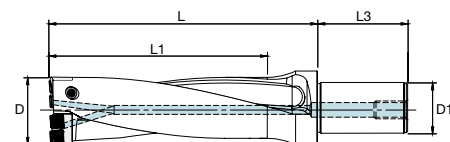
1173





## palbit Indexable inserts - solid drill bits with cartridge system SCC 3D/4D



- Surface-hardened carrier tools
- **Available tool lengths of 3xD and 4xD**
- **Diameter 50-80 mm**
- Optimised chip space geometry and cutting edge positions for stable drilling
- Wide range of applications
- Good chip control and reduced cutting forces
- **Suitable indexable cutting inserts SPKX**
- Supplied with inner and outer cartridge





### SCC 3D - 3xD

Designation	D mm	L1 mm	L mm	D1 mm	L3 mm	suitable indexable inserts	suitable cartridge			art.no.	€
SCC 505540-3D	55-50	165	205	40	70	SPKX 090408	SCC 050055-1/O	A1	B1	<b>124413</b> 5055	679,-
SCC 556040-3D	60-55	180	220	40	70	SPKX 090408	SCC 055060-1/O	A1	B1	124413 5560	729,-
SCC 606540-3D	65-60	195	235	40	70	SPKX 110408	SCC 060065-1/O	A2	B1	124413 6065	839,-
SCC 657040-3D	70-65	210	250	40	70	SPKX 110408	SCC 065070-1/O	A2	B1	124413 6570	879,-
SCC 707540-3D	75-70	225	265	40	70	SPKX 110408	SCC 070075-1/O	A2	B1	124413 7075	929,-
SCC 758040-3D	80-75	240	278	40	70	SPKX 140512	SCC 075080-1/O	A3	B2	124413 7580	969,-

1173

### SCC 4D - 4xD

Designation	D mm	L1 mm	L mm	D1 mm	L3 mm	suitable indexable inserts	suitable cartridge			art.no.	€
SCC 505540-4D	55-50	220	260	40	70	SPKX 090408	SCC 050055-1/O	A1	B1	<b>124414</b> 5055	779,-
SCC 556040-4D	60-55	240	280	40	70	SPKX 090408	SCC 055060-1/O	A1	B1	124414 5560	839,-
SCC 606540-4D	65-60	260	300	40	70	SPKX 110408	SCC 060065-1/O	A2	B1	124414 6065	969,-
SCC 657040-4D	70-65	280	320	40	70	SPKX 110408	SCC 065070-1/O	A2	B1	124414 6570	999,-
SCC 707540-4D	75-70	300	340	40	70	SPKX 110408	SCC 070075-1/O	A2	B1	124414 7075	1.059,-
SCC 758040-4D	80-75	320	358	40	70	SPKX 140512	SCC 075080-1/O	A3	B2	124414 7580	1.109,-

1173

### SCC cartridges

- Inner cartridge **SCC-I**, outer cartridge **SCC-O**

Designation	D mm	for indexable inserts	suitable for solid drill bits mm	SCC-I inner cartridge art.no.	€	SCC-O outer cartridge art.no.	€
SCC 050055	55-50	SPKX 090408	SCC 505540-3D/4D	<b>124410</b> 5055	88,60	<b>124411</b> 5055	88,60
SCC 055060	60-55	SPKX 090408	SCC 556040-3D/4D	124410 5560	88,60	124411 5560	88,60
SCC 060065	65-60	SPKX 110408	SCC 606540-3D/4D	124410 6065	98,40	124411 6065	98,40
SCC 065070	70-65	SPKX 110408	SCC 657040-3D/4D	124410 6570	98,40	124411 6570	98,40
SCC 070075	75-70	SPKX 110408	SCC 707540-3D/4D	124410 7075	98,40	124411 7075	98,40
SCC 075080	80-75	SPKX 140512	SCC 758040-3D/4D	124410 7580	107,-	124411 7580	107,-

3160

3160



### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 321099 0010	4,07		B1 703053 0150	1,93	
A2 321099 0017	3,54		B2 703053 0200	1,93	
A3 321099 0411	5,70				

3160

7114

**palbit** Indexable cutting inserts SPKX

- Carbide indexable cutting inserts, positive 11°
- **PH6920** PVD-coated (TiAlN)  
Fine grain carbide for universal applications, good toughness and wear resistance
- **PH6930** PVD-coated (TiAlN)  
Superfine grain carbide for applications under unstable machine conditions at moderate cutting speeds
- **PHC930** PVD-coated (TiAlN+TiN)  
Fine grain carbide for universal applications at high cutting speeds

ISO designation	ISO <b>P M K S</b>			ISO <b>P M K S</b>			ISO <b>P M K S</b>		
	PH6920	PH6930	PHC930	PH6920	PH6930	PHC930	PH6920	PH6930	PHC930
art.no.	art.no.	art.no.	art.no.	art.no.	art.no.	art.no.	art.no.	art.no.	art.no.
SPKX 05T104	10 124512 0105 9,25								
SPKX 05O204	10 124512 0005 9,80	10 124513 0005 9,80	10 124514 0005 9,80						
SPKX 06O204	10 124512 0006 10,85	10 124513 0006 10,85	10 124514 0006 10,85						
SPKX 07O308	10 124512 0107 10,30								
SPKX 07T308	10 124512 0007 10,85	10 124513 0007 10,85	10 124514 0007 10,85						
SPKX 09O308	10 124512 0109 11,10								
SPKX 09O408	10 124512 0009 11,40	10 124513 0009 11,40	10 124514 0009 11,40						
SPKX 11O408	10 124512 0011 12,45	10 124513 0011 12,45	10 124514 0011 12,45						
SPKX 14O512	10 124512 0014 13,-	10 124513 0014 13,-	10 124514 0014 13,-						
	1171	1171	1171						



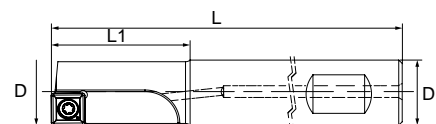
**palbit** Core and countersink drill

**NEW**



- with internal cooling
- for countersinking and drilling
- flat countersinks for producing countersinks for cylinder head screws, countersinks, sealing surfaces
- Fixed dimension spiral countersink for drilling pre-machined or cast bores
- **The diameter of the hole to be drilled must not be smaller than Dimension A!**
- suitable indexable cutting inserts SPKX

D mm	L mm	D1 mm	L1 mm	A mm	suitable indexable inserts	art.no.	€	
10	100	10	30	3	SPKX 05T104	124700 0100	90,10	
11	100	12	30	3	SPKX 05T104	124700 0110	101,-	
13	100	16	30	4	SPKX 06O204	124700 0130	113,50	
14	120	16	30	4	SPKX 06O204	124700 0140	113,50	
17	120	20	35	5	SPKX 07O308	124700 0170	116,50	
18	140	20	35	5	SPKX 07O308	124700 0180	118,50	
20	140	20	40	6	SPKX 09O308	124700 0200	127,50	
21	150	25	40	6	SPKX 09O308	124700 0210	141,-	
25	150	25	40	7	SPKX 11O408	124700 0250	156,-	
							2174	



Spare parts

Screw		TORX	
art.no.	€	art.no.	€
A1 321099 0004	4,07	B1 703053 0060	1,93
A2 321099 0006	4,07	B2 703053 0070	1,93
A3 321099 0009	4,34	B3 703053 0080	1,93
A4 321099 0014	4,07	B4 703053 0150	1,93
A5 321099 0524	4,07		
3160		7114	



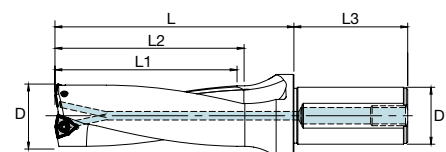
Precision ...

... but digital.

**ATORN**  
Performance demands quality



**palbit**  Indexable inserts - solid drill bits TDS 3D


- Surface-hardened carrier tools
- **Drilling depths up to 3xD**
- **Diameter 13-58 mm**
- Soft cutting for lower power requirement
- Optimised chip space geometry and cutting edge positions for stable drilling
- Wide range of applications in structural steel and stainless steels
- Good chip control and reduced cutting forces
- **With internal coolant supply**
- Bore tolerances:  
 $\varnothing 13-21.5 \text{ mm} > -0.1/+0.15 \text{ mm}$ ;  $\varnothing 22-50 \text{ mm} > -0.12/+0.2 \text{ mm}$ ;  $\varnothing 50-58 \text{ mm} > -0.15/+0.25 \text{ mm}$
- **Suitable indexable cutting inserts WCKX**





Designation	D mm	L1 mm	L2 mm	L mm	D1 mm	L3 mm	suitable indexable inserts			art.no.	€
TDS 13020-3D	13	39	42	62	20	50	WCKX 02T104	A6	B1	<b>124303 0130</b>	<b>173,50</b>
TDS 13520-3D	13.5	41	44	64	20	50	WCKX 02T104	A6	B1	124303 0135	173,50
TDS 14020-3D	14	42	45	65	20	50	WCKX 02T104	A6	B1	124303 0140	173,50
TDS 14520-3D	14.5	44	47	67	20	50	WCKX 02T104	A6	B1	124303 0145	173,50
TDS 15020-3D	15	45	48	68	20	50	WCKX 02T104	A6	B1	124303 0150	173,50
TDS 15520-3D	15.5	47	50	70	20	50	WCKX 02T104	A6	B1	124303 0155	173,50
TDS 16025-3D	16	48	51	76	25	56	WCKX 030204	A1	B2	124303 0160	158,-
TDS 16525-3D	16.5	50	53	78	25	56	WCKX 030204	A1	B2	124303 0165	158,-
TDS 17025-3D	17	51	54	79	25	56	WCKX 030204	A1	B2	124303 0170	158,-
TDS 17525-3D	17.5	53	56	81	25	56	WCKX 030204	A1	B2	124303 0175	158,-
TDS 18025-3D	18	54	57	82	25	56	WCKX 030204	A1	B2	124303 0180	158,-
TDS 18525-3D	18.5	56	59	84	25	56	WCKX 030204	A1	B2	124303 0185	158,-
TDS 19025-3D	19	57	60	85	25	56	WCKX 030204	A1	B2	124303 0190	158,-
TDS 19525-3D	19.5	59	62	87	25	56	WCKX 030204	A1	B2	124303 0195	158,-
TDS 20025-3D	20	60	63	88	25	56	WCKX 030204	A1	B2	124303 0200	158,-
TDS 20525-3D	20.5	62	65	90	25	56	WCKX 040204	A2	B3	124303 0205	164,-
TDS 21025-3D	21	63	66	91	25	56	WCKX 040204	A2	B3	124303 0210	164,-
TDS 21525-3D	21.5	65	68	93	25	56	WCKX 040204	A2	B3	124303 0215	164,-
TDS 22025-3D	22	66	69	94	25	56	WCKX 040204	A2	B3	124303 0220	164,-
TDS 22525-3D	22.5	68	71	96	25	56	WCKX 040204	A2	B3	124303 0225	164,-
TDS 23025-3D	23	69	72	97	25	56	WCKX 040204	A2	B3	124303 0230	164,-
TDS 23525-3D	23.5	71	74	99	25	56	WCKX 040204	A2	B3	124303 0235	164,-
TDS 24025-3D	24	72	75	100	25	56	WCKX 040204	A2	B3	124303 0240	164,-
TDS 24525-3D	24.5	74	77	102	25	56	WCKX 040204	A2	B3	124303 0245	164,-
TDS 25025-3D	25	75	78	103	25	56	WCKX 040204	A2	B3	124303 0250	164,-
TDS 25532-3D	25.5	77	80	110	32	60	WCKX 050308	A5	B3	124303 0255	183,50
TDS 26032-3D	26	78	81	111	32	60	WCKX 050308	A5	B3	124303 0260	183,50
TDS 26532-3D	26.5	80	83	113	32	60	WCKX 050308	A5	B3	124303 0265	183,50
TDS 27032-3D	27	81	84	114	32	60	WCKX 050308	A5	B3	124303 0270	183,50
TDS 27532-3D	27.5	83	86	116	32	60	WCKX 050308	A5	B3	124303 0275	183,50
TDS 28032-3D	28	84	87	117	32	60	WCKX 050308	A5	B3	124303 0280	183,50
TDS 28532-3D	28.5	86	89	119	32	60	WCKX 050308	A5	B3	124303 0285	183,50
TDS 29032-3D	29	87	90	120	32	60	WCKX 050308	A5	B3	124303 0290	183,50
TDS 29532-3D	29.5	89	92	122	32	60	WCKX 050308	A5	B3	124303 0295	183,50
TDS 30032-3D	30	90	93	123	32	60	WCKX 050308	A5	B3	124303 0300	183,50
TDS 31032-3D	31	93	96	126	32	60	WCKX 06T308	A3	B4	124303 0310	198,-
TDS 32032-3D	32	96	99	129	32	60	WCKX 06T308	A3	B4	124303 0320	198,-
TDS 33032-3D	33	99	102	132	32	60	WCKX 06T308	A3	B4	124303 0330	198,-
TDS 34032-3D	34	102	105	135	32	60	WCKX 06T308	A3	B4	124303 0340	198,-
TDS 35032-3D	35	105	108	138	32	60	WCKX 06T308	A3	B4	124303 0350	198,-
TDS 36032-3D	36	108	111	141	32	60	WCKX 06T308	A3	B4	124303 0360	215,-
TDS 37032-3D	37	111	114	144	32	60	WCKX 06T308	A3	B4	124303 0370	215,-
TDS 38032-3D	38	114	117	147	32	60	WCKX 06T308	A3	B4	124303 0380	215,-
TDS 39032-3D	39	117	120	150	32	60	WCKX 06T308	A3	B4	124303 0390	215,-
TDS 40032-3D	40	120	123	153	32	60	WCKX 06T308	A3	B4	124303 0400	215,-
TDS 41032-3D	41	123	126	156	32	60	WCKX 06T308	A3	B4	124303 0410	215,-

1173

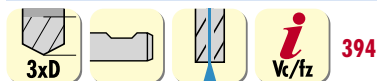
Designation	D mm	L1 mm	L2 mm	L mm	D1 mm	L3 mm	suitable indexable inserts			art.no.	€
TDS 42040-3D	42	126	129	164	40	70	WCKX 080408	A4	B4	124303 0420	235,-
TDS 43040-3D	43	129	132	167	40	70	WCKX 080408	A4	B4	124303 0430	235,-
TDS 44040-3D	44	132	135	170	40	70	WCKX 080408	A4	B4	124303 0440	235,-
TDS 45040-3D	45	135	138	173	40	70	WCKX 080408	A4	B4	124303 0450	235,-
TDS 46040-3D	46	138	141	176	40	70	WCKX 080408	A4	B4	124303 0460	250,-
TDS 47040-3D	47	141	144	179	40	70	WCKX 080408	A4	B4	124303 0470	250,-
TDS 48040-3D	48	144	147	182	40	70	WCKX 080408	A4	B4	124303 0480	250,-
TDS 49040-3D	49	147	150	185	40	70	WCKX 080408	A4	B4	124303 0490	250,-
TDS 50040-3D	50	150	153	188	40	70	WCKX 080408	A4	B4	124303 0500	250,-
TDS 51040-3D	51	153	156	191	40	70	WCKX 080408	A4	B4	124303 0510	261,-
TDS 52040-3D	52	156	159	194	40	70	WCKX 080408	A4	B4	124303 0520	261,-
TDS 53040-3D	53	159	162	197	40	70	WCKX 080408	A4	B4	124303 0530	261,-
TDS 54040-3D	54	162	165	200	40	70	WCKX 080408	A4	B4	124303 0540	261,-
TDS 55040-3D	55	165	168	203	40	70	WCKX 080408	A4	B4	124303 0550	261,-
TDS 56040-3D	56	168	171	206	40	70	WCKX 080408	A4	B4	124303 0560	279,-
TDS 57040-3D	57	171	174	209	40	70	WCKX 080408	A4	B4	124303 0570	279,-
TDS 58040-3D	58	174	177	212	40	70	WCKX 080408	A4	B4	124303 0580	279,-

1173

Spare parts



Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0004	4,07	B1	703053 0060	1,93
A2	321099 0005	4,07	B2	703053 0070	1,93
A3	321099 0010	4,07	B3	703053 0080	1,93
A4	321099 0016	4,07	B4	703053 0150	1,93
A5	321099 0047	4,07			
A6	321099 0298	4,07			
3160			7114		

**palbit**  Indexable inserts - solid drill bits with cartridge system TDC 3D

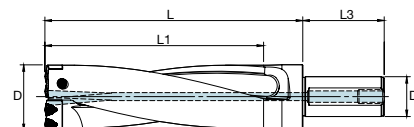


- Surface-hardened carrier tools
- **Drilling depths up to 3xD**
- **Diameter 59-80 mm**
- Soft cutting for lower power requirement
- Wide range of applications in structural steel and stainless steels
- Good chip control and reduced cutting forces
- **With internal coolant supply**
- **Suitable indexable cutting inserts WCKX**
- Supplied with inner and outer cartridge

TDC 3D

Designation	D mm	L1 mm	L mm	D1 mm	L3 mm	suitable indexable inserts	suitable cartridge			art.no.	€
TDC 596540-3D	65-59	195	235	40	70	WCKX 06T308	TDC 059065	A1	B1	124313 5965	749,-
TDC 657040-3D	70-65	210	250	40	70	WCKX 06T308	TDC 065070	A1	B1	124313 6570	779,-
TDC 707540-3D	75-70	225	265	40	70	WCKX 06T308	TDC 070075	A1	B1	124313 7075	809,-
TDC 758040-3D	80-75	240	280	40	70	WCKX 06T308	TDC 075080	A1	B1	124313 7580	839,-

1173



TDC cartridges

- Inner cartridge **TDC-I**, outer cartridge **TDC-O**



Designation	D mm	suitable indexable inserts	suitable for solid drill bits mm	TDC-I inner cartridge art.no.	€	TDC-O outer cartridge art.no.	€
TDC 059065	65-59	WCKX 06T308	TDC 596540-3D	124311 5965	88,60	124310 5965	88,60
TDC 065070	70-65	WCKX 06T308	TDC 657040-3D	124311 6570	97,40	124310 6570	97,40
TDC 070075	75-70	WCKX 06T308	TDC 707540-3D	124311 7075	97,40	124310 7075	97,40
TDC 075080	80-75	WCKX 06T308	TDC 758040-3D	124311 7580	97,40	124310 7580	97,40

3160

3160



Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0010	4,07	B1	703053 0150	1,93
3160			7114		

**palbit** Indexable cutting inserts WCKX

- Carbide indexable cutting inserts, positive 7°
- **PH6920** - PVD-coated (TiAlN) fine grain carbide for universal applications. Good toughness and wear resistance.
- **PH6930** - PVD-coated (TiAlN) superfine grain carbide for applications under unstable machine conditions at average cutting speeds.
- **Recommendation:** Chip breaker LC specially designed for machining low-carbon steels

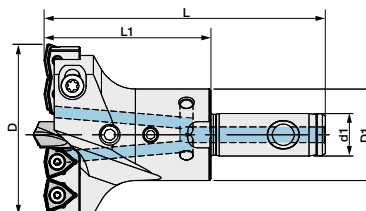


ISO designation	ISO <b>P M K S</b>		ISO <b>P M K S</b>		ISO <b>P</b>		ISO <b>P</b>	
	PH6920 art.no.	€	PH6930 art.no.	€	-LC PH6920 art.no.	€	-LC PH6930 art.no.	€
WCKX 02T104	10 124522 0002	7,85	10 124523 0002	7,85				
WCKX 030204	10 124522 0003	7,85	10 124523 0003	7,85				
WCKX 040204	10 124522 0004	7,85	10 124523 0004	7,85				
WCKX 050308	10 124522 0005	8,95	10 124523 0005	8,95	10 124532 0005	8,95	10 124533 0005	8,95
WCKX 06T308	10 124522 0006	8,95	10 124523 0006	8,95	10 124532 0006	8,95	10 124533 0006	8,95
WCKX 080408	10 124522 0008	10,30	10 124523 0008	10,30				
	1171		1171		1171		1171	

**palbit** Indexable inserts drilling system VORTEX DRILL



- **Machining of bore holes from Ø 45 to 180 mm**
- Drilling in a single work step without centring and pre-drilling
- The modular design allows efficient use through possible diameter bridging of up to 10 mm.
- Variable drilling depths of up to 10 x D due to holder system with pluggable extensions
- **Internal coolant supply**
- **Suitable indexable cutting inserts WCKX**
- Supplied with inner and outer cartridge



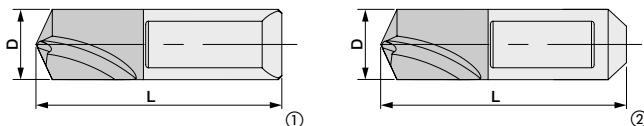
**Boring head MDO 10D**

Designation	D mm	Working area mm	d1 mm	L1 mm	L mm	D1 mm	suitable cartridge	suitable indexable inserts	Number of index. inserts	suitable pilot drill	A1	B1	art.no.	€
MDO 04505013	50	45-50	13	50	85	28	MDC 045050-1/0	WCKX 030204	2+2	MDP 3510	A1	B1	104503 4550	490,-
MDO 05005513	55	50-55	13	50	85	28	MDC 050055-1/0	WCKX 030204	2+2	MDP 3510	A1	B1	104503 5055	519,-
MDO 05506016	60	55-60	16	60	100	32	MDC 055060-1/0	WCKX 040204	2+2	MDP 3812	A2	B2	104503 5560	559,-
MDO 06006516	65	60-65	16	60	100	32	MDC 060065-1/0	WCKX 050308	2+2	MDP 3812	A5	B2	104503 6065	649,-
MDO 06507016	70	65-70	16	60	100	32	MDC 065070-1/0	WCKX 050308	2+2	MDP 3812	A5	B2	104503 6570	699,-
MDO 07007522	75	70-75	22	70	115	40	MDC 070075-1/0	WCKX 050308	2+2	MDP 3812	A5	B2	104503 7075	699,-
MDO 07508022	80	75-80	22	70	115	40	MDC 075080-1/0	WCKX 06T308	2+2	MDP 4516	A3	B3	104503 7580	729,-
MDO 08008522	85	80-85	22	70	115	40	MDC 080085-1/0	WCKX 06T308	2+2	MDP 4516	A3	B3	104503 8085	769,-
MDO 08509027	90	85-90	27	70	120	48	MDC 085090-1/0	WCKX 06T308	2+2	MDP 4516	A3	B3	104503 8590	769,-
MDO 09009527	95	90-95	27	70	120	48	MDC 090095-1/0	WCKX 06T308	2+2	MDP 4516	A3	B3	104503 9095	769,-
MDO 09510027	100	95-100	27	70	120	48	MDC 095100-1/0	WCKX 06T308	2+2	MDP 4516	A3	B3	104503 9510	829,-
MDO 10010532	105	100-105	32	80	130	58	MDC 100105-1/0	WCKX 050308	3+3	MDP 4520	A5	B2	104503 1005	829,-
MDO 10511032	110	105-110	32	80	130	58	MDC 105110-1/0	WCKX 06T308	3+3	MDP 4520	A3	B3	104503 0511	829,-
MDO 11011532	115	110-115	32	80	130	58	MDC 110115-1/0	WCKX 06T308	3+3	MDP 4520	A3	B3	104503 1015	829,-
MDO 11512040	120	115-120	40	90	145	70	MDC 115120-1/0	WCKX 06T308	3+3	MDP 4520	A3	B3	104503 1520	989,-
MDO 12012540	125	120-125	40	90	145	70	MDC 120125-1/0	WCKX 06T308	3+3	MDP 5625	A3	B3	104503 2025	1.099,-
MDO 12513040	130	125-130	40	90	145	70	MDC 125130-1/0	WCKX 06T308	3+3	MDP 5625	A3	B3	104503 2530	1.099,-
MDO 13013540	135	130-135	40	90	145	70	MDC 130135-1/0	WCKX 06T308	3+3	MDP 5625	A3	B3	104503 3035	1.099,-
MDO 13514040	140	135-140	40	90	145	70	MDC 135140-1/0	WCKX 06T308	3+3	MDP 5625	A3	B3	104503 3540	1.099,-
MDO 14015050	150	140-150	50	100	160	80	MDC 140150-1/0	WCKX 080408	3+3	MDP 5625	A4	B3	104503 1415	1.329,-
MDO 15016050	160	150-160	50	100	160	80	MDC 150160-1/0	WCKX 080408	3+3	MDP 5625	A4	B3	104503 1516	1.329,-
MDO 16017050	170	160-170	50	100	160	80	MDC 160170-1/0	WCKX 080408	3+3	MDP 6830	A4	B3	104503 1617	1.359,-
MDO 17018050	180	170-180	50	100	160	80	MDC 170180-1/0	WCKX 080408	3+3	MDP 6830	A4	B3	104503 1718	1.729,-

1173

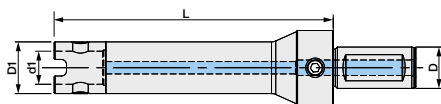
**Pilot drill bit MDP**

- Point angle 118°
- **Cutting material:** HSS, TiN-coated
- with internal cooling



Designation	D mm	L mm	Illustration	for boring head	art.no.	€
MDP 3510	10	35	1	MDO 45-55 mm	<b>104519 0010</b>	<b>35,70</b>
MDP 3812	12	38	1	MDO 55-75 mm	104519 0012	<b>45,50</b>
MDP 4516	16	45	1	MDO 75-100 mm	104519 0016	<b>53,40</b>
MDP 4520	20	45	2	MDO 100-120 mm	104519 0020	<b>81,90</b>
MDP 5625	25	56	2	MDO 120-160 mm	104519 0025	<b>104,-</b>
MDP 6830	30	68	2	MDO 160-180 mm	104519 0030	<b>144,50</b>

3160

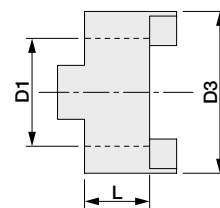


**Holding fixture MDS**

- **Please note:** Supplied without follower ring, please order separately!

Designation	D mm	d1 mm	D1 mm	L mm	suitable follower ring	art.no.	€
MDS 32115130	32	13	28	115	MDR 1028	<b>104513 1301</b>	<b>130,50</b>
MDS 32200130	32	13	28	200	MDR 1028	104513 1302	<b>161,50</b>
MDS 32300130	32	13	28	300	MDR 1028	104513 1303	<b>194,50</b>
MDS 40125160	40	16	32	125	MDR 1032	104513 1601	<b>145,50</b>
MDS 40200160	40	16	32	200	MDR 1032	104513 1602	<b>161,50</b>
MDS 40300160	40	16	32	300	MDR 1032	104513 1603	<b>210,-</b>
MDS 40148220	40	22	40	148	MDR 1240	104513 2201	<b>161,50</b>
MDS 40200220	40	22	40	200	MDR 1240	104513 2202	<b>194,50</b>
MDS 40300220	40	22	40	300	MDR 1240	104513 2203	<b>227,-</b>
MDS 40168270	40	27	48	168	MDR 1248	104513 2701	<b>194,50</b>
MDS 40300270	40	27	48	300	MDR 1248	104513 2702	<b>259,-</b>
MDS 40186320	40	32	58	186	MDR 1458	104513 3201	<b>227,-</b>
MDS 40300320	40	32	58	300	MDR 1458	104513 3202	<b>259,-</b>
MDS 50186400	50	40	70	186	MDR 1470	104513 4001	<b>259,-</b>
MDS 50300400	50	40	70	300	MDR 1470	104513 4002	<b>324,-</b>
MDS 50184500	50	50	80	184	MDR 1680	104513 5001	<b>291,-</b>

1173



**Follower ring MDR**

Designation	D3 mm	D1 mm	L mm	art.no.	€
MDR 1028	28	13	10	<b>104520 0013</b>	<b>35,70</b>
MDR 1032	32	16	10	104520 0016	<b>35,70</b>
MDR 1240	40	22	12	104520 0022	<b>45,50</b>
MDR 1248	48	27	12	104520 0027	<b>52,40</b>
MDR 1458	58	32	14	104520 0032	<b>72,-</b>
MDR 1470	70	40	14	104520 0040	<b>82,90</b>
MDR 1680	80	50	16	104520 0050	<b>102,50</b>

3160

**Spare parts**

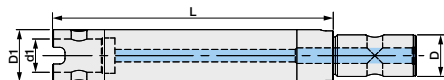
Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0004	<b>4,07</b>	B1	703053 0070	<b>1,93</b>
A2	321099 0005	<b>4,07</b>	B2	703053 0080	<b>1,93</b>
A3	321099 0010	<b>4,07</b>	B3	703053 0150	<b>1,93</b>
A4	321099 0016	<b>4,07</b>			
A5	321099 0047	<b>4,07</b>			

3160

7114

Continued on next page >>>



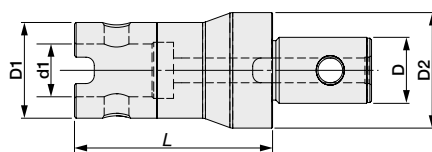


### Extension MDE

• **Please note:** Supplied without follower ring, please order separately!

Designation	D mm	d1 mm	D1 mm	L mm	suitable follower ring	art.no.	€
MDE 13115280	13	13	28	115	MDR 1028	<b>104514</b> 1301	130,50
MDE 13150280	13	13	28	150	MDR 1028	104514 1302	137,50
MDE 13200280	13	13	28	200	MDR 1028	104514 1303	137,50
MDE 13300280	13	13	28	300	MDR 1028	104514 1304	161,50
MDE 16115320	16	16	32	115	MDR 1032	104514 1601	137,50
MDE 16200320	16	16	32	200	MDR 1032	104514 1602	146,-
MDE 16300320	16	16	32	300	MDR 1032	104514 1603	178,50
MDE 22113400	22	22	40	113	MDR 1240	104514 2201	146,-
MDE 22200400	22	22	40	200	MDR 1240	104514 2202	162,-
MDE 22300400	22	22	40	300	MDR 1240	104514 2203	194,50
MDE 27113480	27	27	48	113	MDR 1248	104514 2701	161,50
MDE 27200480	27	27	48	200	MDR 1248	104514 2702	194,50
MDE 27300480	27	27	48	300	MDR 1248	104514 2703	227,-
MDE 32186580	32	32	58	186	MDR 1458	104514 3201	210,-
MDE 32300580	32	32	58	300	MDR 1458	104514 3202	259,-
MDE 40186700	40	40	70	186	MDR 1470	104514 4001	227,-
MDE 40300700	40	40	70	300	MDR 1470	104514 4002	291,-
MDE 40500700	40	40	70	500	MDR 1470	104514 4003	405,-
MDE 50204800	50	50	80	204	MDR 1680	104514 5001	259,-
MDE 50300800	50	50	80	300	MDR 1680	104514 5002	355,-
MDE 50500800	50	50	80	500	MDR 1680	104514 5003	485,-

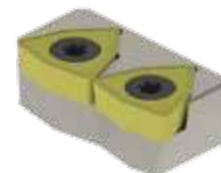
1173



### Reducer MDM

Designation	d1 mm	D mm	D1 mm	D2 mm	L mm	suitable follower ring	art.no.	€
MDM 16100130	13	16	28	32	100	MDR 1028 (D1) / MDR 1032 (D2)	<b>104521</b> 1613	135,-
MDM 22100160	16	22	32	40	100	MDR 1032 (D1) / MDR 1240 (D2)	104521 2216	135,-
MDM 27100220	22	27	40	48	100	MDR 1240 (D1) / MDR 1248 (D2)	104521 2722	135,-
MDM 32100130	13	32	28	58	100	MDR 1028 (D1) / MDR 1458 (D2)	104521 3213	169,-
MDM 32100160	16	32	32	58	100	MDR 1032 (D1) / MDR 1458 (D2)	104521 3216	169,-
MDM 32100220	22	32	40	58	100	MDR 1240 (D1) / MDR 1458 (D2)	104521 3222	169,-
MDM 32100270	27	32	48	58	100	MDR 1248 (D1) / MDR 1458 (D2)	104521 3227	169,-
MDM 40100320	32	40	58	70	100	MDR 1458 (D1) / MDR 1470 (D2)	104521 4032	169,-
MDM 50080130	13	50	28	80	80	MDR 1028 (D1) / MDR 1680 (D2)	104521 5013	169,-
MDM 50080160	16	50	32	80	80	MDR 1032 (D1) / MDR 1680 (D2)	104521 5016	169,-
MDM 50080220	22	50	40	80	80	MDR 1240 (D1) / MDR 1680 (D2)	104521 5022	169,-
MDM 50080270	27	50	48	80	80	MDR 1248 (D1) / MDR 1680 (D2)	104521 5027	169,-
MDM 50080320	32	50	58	80	80	MDR 1458 (D1) / MDR 1680 (D2)	104521 5032	169,-
MDM 50150400	40	50	70	80	150	MDR 1470 (D1) / MDR 1680 (D2)	104521 5040	169,-

1173



### Boring head cartridges MDC

- Inner cartridge **MDC-I**, outer cartridge **MDC-O**
- < Ø 100 mm 2 indexable cutting inserts per cartridge
- > Ø 100 mm 3 indexable cutting inserts per cartridge

Designation	Working area mm	for indexable inserts	Number of index. inserts	for boring head	MDC-I inner cartridge art.no.	€	MDC-O outer cartridge art.no.	€
MDC 045050	45-50	WCKX 030204	2	MDO 04505013	<b>104517</b> 4550	<b>85,50</b>	<b>104518</b> 4550	<b>85,50</b>
MDC 050055	50-55	WCKX 030204	2	MDO 05005513	104517 5055	<b>85,50</b>	104518 5055	<b>85,50</b>
MDC 055060	55-60	WCKX 040204	2	MDO 05506016	104517 5560	<b>85,50</b>	104518 5560	<b>85,50</b>
MDC 060065	60-65	WCKX 050308	2	MDO 06006516	104517 6065	<b>93,60</b>	104518 6065	<b>93,60</b>
MDC 065070	65-70	WCKX 050308	2	MDO 06507016	104517 6570	<b>93,60</b>	104518 6570	<b>93,60</b>
MDC 070075	70-75	WCKX 050308	2	MDO 07007522	104517 7075	<b>93,60</b>	104518 7075	<b>93,60</b>
MDC 075080	75-80	WCKX 06T308	2	MDO 07508022	104517 7580	<b>93,60</b>	104518 7580	<b>93,60</b>
MDC 080085	80-85	WCKX 06T308	2	MDO 08008522	104517 8085	<b>102,50</b>	104518 8085	<b>102,50</b>
MDC 085090	85-90	WCKX 06T308	2	MDO 08509027	104517 8590	<b>102,50</b>	104518 8590	<b>102,50</b>
MDC 090095	90-95	WCKX 06T308	2	MDO 09009527	104517 9095	<b>102,50</b>	104518 9095	<b>102,50</b>
MDC 095100	95-100	WCKX 06T308	2	MDO 09510027	104517 9510	<b>102,50</b>	104518 9510	<b>102,50</b>
MDC 100105	100-105	WCKX 050308	3	MDO 10010532	104517 1005	<b>119,-</b>	104518 1005	<b>119,-</b>
MDC 105110	105-110	WCKX 06T308	3	MDO 10511032	104517 0511	<b>128,-</b>	104518 0511	<b>128,-</b>
MDC 110115	110-115	WCKX 06T308	3	MDO 11011532	104517 1115	<b>128,-</b>	104518 1115	<b>128,-</b>
MDC 115120	115-120	WCKX 06T308	3	MDO 11512040	104517 1520	<b>128,-</b>	104518 1520	<b>128,-</b>
MDC 120125	120-125	WCKX 06T308	3	MDO 12012540	104517 2025	<b>128,-</b>	104518 2025	<b>128,-</b>
MDC 125130	125-130	WCKX 06T308	3	MDO 12513040	104517 2530	<b>128,-</b>	104518 2530	<b>128,-</b>
MDC 130135	130-135	WCKX 06T308	3	MDO 13013540	104517 3035	<b>128,-</b>	104518 3035	<b>128,-</b>
MDC 135140	135-140	WCKX 06T308	3	MDO 13514040	104517 3540	<b>128,-</b>	104518 3540	<b>128,-</b>
MDC 140150	140-150	WCKX 080408	3	MDO 14015050	104517 1415	<b>136,50</b>	104518 1415	<b>136,50</b>
MDC 150160	150-160	WCKX 080408	3	MDO 15016050	104517 1516	<b>136,50</b>	104518 1516	<b>136,50</b>
MDC 160170	160-170	WCKX 080408	3	MDO 16017050	104517 1617	<b>136,50</b>	104518 1617	<b>136,50</b>
MDC 170180	170-180	WCKX 080408	3	MDO 17018050	104517 1718	<b>136,50</b>	104518 1718	<b>136,50</b>
					3160		3160	



# SARA® SARADRILL solid drilling tool

HSS-E-PM
15xD
TiN
Vc/fz
389



- **Machining of bore holes from Ø 49 to 270 mm**
- **For machines with low drive power**
- Low-vibration, equipment-friendly machining with up to 50 % less drive power
- Drilling in a single operation without centring and pre-drilling
- No front face planing required
- Cost-efficient boring system, since differences in diameter of up to 30 mm can be machined with one boring head by changing the cutting edges
- Variable drilling depths of up to 15 x D due to holding fixture system with pluggable extensions
- Internal coolant supply directly to the cutting edge, no high-pressure pump required
- For rotating tools, the coolant is supplied via a coolant ring
- Short chips due to chip-separating grooves in the roughing blade, no chip removal, even with extremely deep bores
- Also for use on vertically operating machines
- Low tool costs as wear is limited to the cutting edges and centre bit
- Unproblematic regrinding of the centre bit and the cutting edges (in pairs) using the grinding fixture or the tool grinding machine
- **Cutting material:**  
Cutting edge **HSS-E-PM ASP30, ASP30 TiN**  
**HSS** centre bit
- For use on all machine tools as a rotating or stationary tool especially for machining large bore diameters on machines with low drive power
- **Caution:** Not suitable for boring out existing holes!

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
104550....	●	●	●	●	○	○	○	●	●			●	●	○		○		
104555....	●	●	●	●	○	○	○	●	●			●	●	○		○		



## Boring head

Designation	Working area mm	art.no.	€
A1-55	49 - 55	104501 0055	669,-
A2-65	55 - 65	104501 0065	669,-
B-80	65 - 80	104501 0080	809,-
C-100	80 - 100	104501 0100	939,-
D-120	100 - 120	104501 0120	1.099,-
E-150	120 - 150	104501 0150	2.499,-
F-180	150 - 180	104501 0180	3.389,-
G-210	180 - 210	104501 0210	4.139,-
H-240	210 - 240	104501 0240	5.529,-
I-270	240 - 270	104501 0270	6.999,-

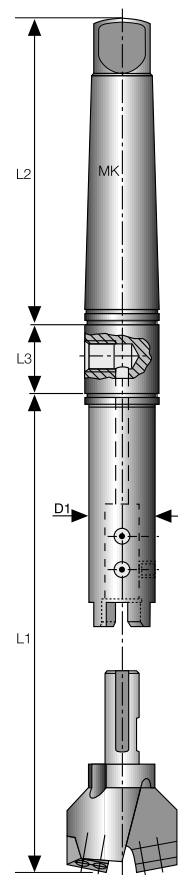
1118



## Boring bar with Morse taper shank

for boring head	L1 mm	L2 mm	L3 mm	D1 mm	Shank	art.no.	€
A1/A2	200	158	30	29	MT 4	104505 0055	375,-
B-80	200	158	30	35	MT 4	104505 0080	395,-
C-100	200	158	30	38	MT 4	104505 0100	440,-
D-120	200	192	30	45	MT 5	104505 0120	769,-
E-150	200	192	30	55	MT 5	104505 0150	909,-
F-180	200	192	30	65	MT 5	104505 0180	1.059,-
G-210	200	192	30	75	MT 5	104505 0210	1.239,-
H-240	200	267	40	85	MT 6	104505 0240	1.649,-
I-270	200	267	40	95	MT 6	104505 0270	1.769,-

1118



**Extension**

- 150 mm and 300 mm

for boring head	D1 mm	150 mm		300 mm	
		art.no.	€	art.no.	€
A1/A2	29	<b>104510 0055</b>	<b>306,-</b>	<b>104515 0055</b>	<b>360,-</b>
B-80	35	104510 0080	331,-	104515 0080	415,-
C-100	38	104510 0100	360,-	104515 0100	435,-
D-120	45	104510 0120	410,-	104515 0120	460,-
E-150	55	104510 0150	769,-	104515 0150	849,-
F-180	65	104510 0180	879,-	104515 0180	979,-
G-210	75	104510 0210	1.049,-	104515 0210	1.079,-
H-240	85	104510 0240	1.169,-	104515 0240	1.279,-
I-270	95	104510 0270	1.399,-	104515 0270	1.509,-
		1118		1118	

**Carbide guide**

- For use with extremely deep bores

for boring head	Working area mm	art.no.	€
B-80	65 - 70	<b>104520 0070</b>	<b>159,-</b>
B-80	70 - 80	104520 0080	159,-
C-100 / D-120	80 - 120	104520 0120	159,-
		1118	

for boring head	Working area mm	art.no.	€
E-150 / F-180	120 - 180	104520 0180	480,-
G-210 / H-240 / I-270	180 - 270	104520 0270	679,-
		1118	

**Centre bit**

for boring head	D mm	Working area mm	art.no.	€
A1-55 to D-120	12	49 - 120	<b>104530 0012</b>	<b>60,90</b>
E-150 to I-270	20	120 - 270	104530 0020	86,50
			1119	

**Coolant ring**

- Compl. with coupling, grip bar and circlips

for boring head	Working area mm	Shank	art.no.	€
A1-55 to C-100	49 - 100	MT 4	<b>104540 0001</b>	<b>183,50</b>
D-120 to G-210	100 - 210	MT 5	104540 0002	290,-
H-240 to I-270	210 - 270	MT 6	104540 0003	769,-
			1118	

**Replacement clamps**

- For boring heads (prices per set of 2 heads)

for boring head	art.no.	€
A1-55	<b>104570 0001</b>	<b>102,-</b>
A2-65	104570 0002	102,-
B-80	104570 0003	102,-
C-100	104570 0004	117,-
D-120	104570 0005	135,50
E-150	104570 0006	331,-
F-180	104570 0007	410,-
G-210	104570 0008	445,-
H-240	104570 0009	445,-
I-270	104570 0010	445,-
		1118



Continued on next page &gt;&gt;&gt;

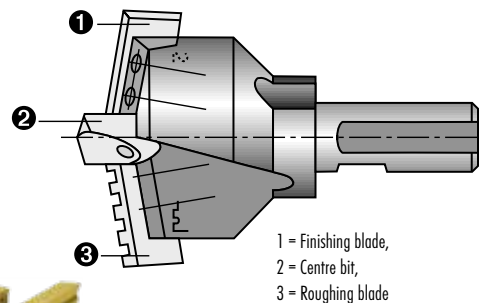
**Drilling with 100 mm diameter into solid material with just 5 KW of drive power?****Use SARADRILL of course****Working example of a user of SARADrill**

Workpiece: Compression cylinder  
 Material: 1.7225, 42CrMo4V  
 Hole: Diameter 100 mm, depth 200 mm  
 Machine: Milling machine  
 Feed rate f: 0.18 mm/rev  
 Cutting speed Vc: 18 m/min

**Drive power: approx. 4.5 KW****Result: 65% savings in working time**

**SARADRILL cutting edge**

- For SARADRILL solid drilling tools
- The cutting edges are delivered in pairs, i.e. 1 roughing blade and 1 finishing blade.
- **Note for machining blind holes:**  
The finishing blade can be adjusted from 3 to 10 mm, depending on the size of the drill head, to machine intermediate dimensions. (Not permissible for machining through-holes!)
- **Caution: The cutting edges may only be replaced in pairs to prevent the risk of breakage!**
- Prices per pair (1 roughing blade and 1 finishing blade)



D mm	for boring head	art.no.		€		TiN	
		art.no.	€	art.no.	€	art.no.	€
49	A1-55	104550 0049	171,-	104555 0049	185,50		
50	A1-55	104550 0050	171,-	104555 0050	185,50		
51	A1-55	104550 0051	171,-	104555 0051	185,50		
52	A1-55	104550 0052	171,-	104555 0052	185,50		
53	A1-55	104550 0053	171,-	104555 0053	185,50		
54	A1-55	104550 0054	171,-	104555 0054	185,50		
55	A1-55,A2-65	104550 0055	171,-	104555 0055	185,50		
56	A2-65	104550 0056	171,-	104555 0056	191,50		
57	A2-65	104550 0057	171,-	104555 0057	191,50		
58	A2-65	104550 0058	171,-	104555 0058	191,50		
59	A2-65	104550 0059	171,-	104555 0059	191,50		
60	A2-65	104550 0060	171,-	104555 0060	191,50		
61	A2-65	104550 0061	177,-	104555 0061	191,50		
62	A2-65	104550 0062	177,-	104555 0062	191,50		
63	A2-65	104550 0063	177,-	104555 0063	191,50		
64	A2-65	104550 0064	177,-	104555 0064	191,50		
65	A2-65,B-80	104550 0065	177,-	104555 0065	191,50		
66	B- 80	104550 0066	215,-	104555 0066	231,-		
67	B- 80	104550 0067	215,-	104555 0067	231,-		
68	B- 80	104550 0068	215,-	104555 0068	231,-		
69	B- 80	104550 0069	215,-	104555 0069	231,-		
70	B- 80	104550 0070	215,-	104555 0070	231,-		
71	B- 80	104550 0071	215,-	104555 0071	231,-		
72	B- 80	104550 0072	215,-	104555 0072	231,-		
73	B- 80	104550 0073	215,-	104555 0073	231,-		
74	B- 80	104550 0074	225,-	104555 0074	257,-		
75	B- 80	104550 0075	225,-	104555 0075	257,-		
76	B- 80	104550 0076	225,-	104555 0076	257,-		
77	B- 80	104550 0077	225,-	104555 0077	257,-		
78	B- 80	104550 0078	225,-	104555 0078	257,-		
79	B- 80	104550 0079	225,-	104555 0079	257,-		
80	B- 80,C- 100	104550 0080	241,-	104555 0080	277,-		
81	C-100	104550 0081	241,-	104555 0081	277,-		
82	C-100	104550 0082	241,-	104555 0082	277,-		
83	C-100	104550 0083	241,-	104555 0083	277,-		
84	C-100	104550 0084	241,-	104555 0084	277,-		
85	C-100	104550 0085	241,-	104555 0085	277,-		
86	C-100	104550 0086	241,-	104555 0086	277,-		
87	C-100	104550 0087	241,-	104555 0087	277,-		
88	C-100	104550 0088	241,-	104555 0088	277,-		
89	C-100	104550 0089	241,-	104555 0089	277,-		
90	C-100	104550 0090	241,-	104555 0090	277,-		
91	C-100	104550 0091	257,-	104555 0091	297,-		
92	C-100	104550 0092	257,-	104555 0092	297,-		
93	C-100	104550 0093	257,-	104555 0093	297,-		
94	C-100	104550 0094	257,-	104555 0094	297,-		
95	C-100	104550 0095	257,-	104555 0095	297,-		

D mm	for boring head	art.no.		€		TiN	
		art.no.	€	art.no.	€	art.no.	€
96	C-100	104550 0096	257,-	104555 0096	297,-		
97	C-100	104550 0097	257,-	104555 0097	297,-		
98	C-100	104550 0098	257,-	104555 0098	297,-		
99	C-100	104550 0099	257,-	104555 0099	297,-		
100	C-100,D- 120	104550 0100	257,-	104555 0100	297,-		
101	D-120	104550 0101	272,-	104555 0101	313,-		
102	D-120	104550 0102	272,-	104555 0102	314,-		
103	D-120	104550 0103	272,-	104555 0103	314,-		
104	D-120	104550 0104	272,-	104555 0104	314,-		
105	D-120	104550 0105	272,-	104555 0105	314,-		
106	D-120	104550 0106	272,-	104555 0106	314,-		
107	D-120	104550 0107	272,-	104555 0107	314,-		
108	D-120	104550 0108	272,-	104555 0108	314,-		
109	D-120	104550 0109	272,-	104555 0109	314,-		
110	D-120	104550 0110	272,-	104555 0110	314,-		
111	D-120	104550 0111	319,-	104555 0111	370,-		
112	D-120	104550 0112	319,-	104555 0112	370,-		
113	D-120	104550 0113	319,-	104555 0113	370,-		
114	D-120	104550 0114	319,-	104555 0114	370,-		
115	D-120	104550 0115	319,-	104555 0115	370,-		
116	D-120	104550 0116	319,-	104555 0116	370,-		
117	D-120	104550 0117	319,-	104555 0117	370,-		
118	D-120	104550 0118	319,-	104555 0118	370,-		
119	D-120	104550 0119	319,-	104555 0119	370,-		
120	D-120	104550 0120	319,-	104555 0120	370,-		
120	E-150	104550 1120	440,-	104555 1120	539,-		
125	E-150	104550 0125	450,-	104555 0125	559,-		
130	E-150	104550 0130	460,-	104555 0130	569,-		
135	E-150	104550 0135	470,-	104555 0135	589,-		
140	E-150	104550 0140	480,-	104555 0140	589,-		
145	E-150	104550 0145	495,-	104555 0145	609,-		
150	E-150	104550 0150	509,-	104555 0150	629,-		
150	F-180	104550 1150	639,-	104555 1150	799,-		
155	F-180	104550 0155	659,-	104555 0155	809,-		
160	F-180	104550 0160	679,-	104555 0160	849,-		
165	F-180	104550 0165	699,-	104555 0165	869,-		
170	F-180	104550 0170	729,-	104555 0170	889,-		
180	F-180,G-210	104550 0180	789,-	104555 0180	949,-		
190	G-210	104550 0190	819,-	104555 0190	989,-		
200	G-210	104550 0200	849,-	104555 0200	999,-		
210	G-210,H-240	104550 0210	879,-	104555 0210	1.019,-		
220	H-240	104550 0220	919,-	104555 0220	1.059,-		
230	H-240	104550 0230	939,-	104555 0230	1.099,-		
240	H-240,I-270	104550 0240	999,-	104555 0240	1.159,-		
250	I-270	104550 0250	1.069,-	104555 0250	1.269,-		
260	I-270	104550 0260	1.119,-	104555 0260	1.329,-		
270	I-270	104550 0270	1.209,-	104555 0270	1.409,-		

1119

1119

1119

1119

# ATORN® Universal Drilling and Turning Tool



- with internal cooling
- series and single-item production for facing and longitudinal turning, drilling, countersinking and chamfering
- Optimises process costs: up to 30% reduced tooling times
- Solves the problem of tool location shortages
- wide range of holders and indexable inserts for a variety of materials
- Minimises tool costs: **one tool for 5 machining methods**

## 1,5 x D

D mm	D1 mm	L1 mm	L mm	suitable indexable inserts			Right-hand		Left-hand	
							art.no.	€	art.no.	€
8	12	12	80	WCHX 0401	A1	B1	129501 0080	183,50	129502 0080	183,50
10	12	15	90	WCHX 05T1	A2	B2	129501 0100	183,50	129502 0100	183,50
11	16	16.5	100	WCHX 0602	A3	B2	129501 0110	183,50	129502 0110	183,50
15	20	22.5	125	WCHX 0703	A4	B2	129501 0150	196,50	129502 0150	196,50
18	25	27	135	WCHX 0903	A5	B3	129501 0180	218,-	129502 0180	218,-
20	25	30	150	WCHX 10T3	A6	B4	129501 0200	239,-	129502 0200	239,-
26	32	39	180	WCHX 1305	A7	B5	129501 0260	286,-	129502 0260	286,-
							1181		1181	

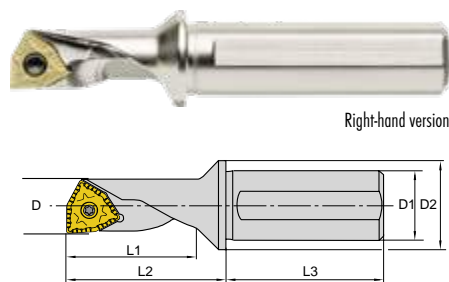
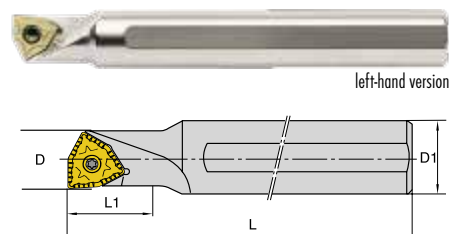
## 2,25 x D

D mm	D1 mm	D2 mm	L2 mm	L3 mm	L1 mm	suitable indexable inserts			Right-hand		Left-hand	
									art.no.	€	art.no.	€
8	10	12	22.5	38	18	WCHX 0401	A1	B1	129511 0080	263,-	129512 0080	263,-
10	12	16	28	42	22.5	WCHX 05T1	A2	B2	129511 0100	263,-	129512 0100	263,-
11	16	20	32	45	24.75	WCHX 0602	A3	B2	129511 0110	263,-	129512 0110	263,-
15	20	25	43	50	33.75	WCHX 0703	A4	B2	129511 0150	285,-	129512 0150	285,-
18	25	32	53	56	40.5	WCHX 0903	A5	B3	129511 0180	312,-	129512 0180	312,-
20	25	32	56	56	45	WCHX 10T3	A6	B4	129511 0200	339,-	129512 0200	339,-
26	32	40	73	60	58.5	WCHX 1305	A7	B5	129511 0260	399,-	129512 0260	399,-
							1181		1181			

- Solid carbide indexable cutting inserts **WCHX** for facing and longitudinal turning, drilling, countersinking and chamfering
- **HW7310** uncoated  
innovative cutting edge geometry with extremely sharp cutting edges for reliable machining of non-ferrous metals  
very hard substrate for long service lives  
very good chip breaking thanks to chip breaker
- **HC7625** coated (TiN)  
universal and reliable use in steel and stainless steel  
excellent combination of wear resistance and toughness
- **HC7535** coated (TiAlN)  
universal and reliable use in steel and stainless steel with increased impact loads  
optimised for machining in unfavourable cutting conditions

ISO designation		ISO		ISO		ISO			
		art.no.	€	art.no.	€	art.no.	€		
WCHX 040102	10	129615 0402	16,90	10	129640 0402	15,20	10	129630 0402	15,20
WCHX 040104	10	129615 0404	16,90	10	129640 0404	15,20	10	129630 0404	15,20
WCHX 05T102	10	129615 0502	17,40	10	129640 0502	15,90	10	129630 0502	15,90
WCHX 05T104	10	129615 0504	17,40	10	129640 0504	15,90	10	129630 0504	15,90
WCHX 060202	10	129615 0602	17,40	10	129640 0602	15,90	10	129630 0602	15,90
WCHX 060204	10	129615 0604	17,40	10	129640 0604	15,90	10	129630 0604	15,90
WCHX 070304	10	129615 0704	17,50	10	129640 0704	16,-	10	129630 0704	16,-
WCHX 070308	10	129615 0708	17,50	10	129640 0708	16,-	10	129630 0708	16,-
WCHX 090304	10	129615 0904	17,90	10	129640 0904	16,30	10	129630 0904	16,30
WCHX 090308	10	129615 0908	17,90	10	129640 0908	16,30	10	129630 0908	16,30
WCHX 10T304	10	129615 1004	18,85	10	129640 1004	17,-	10	129630 1004	17,-
WCHX 10T308	10	129615 1008	18,85	10	129640 1008	17,-	10	129630 1008	17,-
WCHX 130508	10	129615 1308	22,90	10	129640 1308	20,90	10	129630 1308	20,90
		1181		1181		1181			

3 cutting edges per indexable insert



## Spare parts

	Screw			Steel grey	
	art.no.	€		art.no.	€
A1	129599 0080	7,90	B1	703038 0060	2,09
A2	129599 0100	7,90	B2	703038 0080	2,09
A3	129599 0110	7,90	B3	703038 0150	2,29
A4	129599 0150	7,90	B4	703038 0200	2,29
A5	129599 0180	5,20	B5	703038 0250	2,29
A6	129599 0200	6,95			
A7	129599 0260	6,95			
			3106		7111

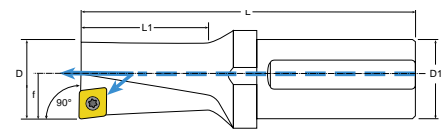


# SARA® SARAcut 2.0 drilling and turning tool



- **Drilling and turning with one tool**
- **Multifunctional:**
  - Solid drilling with a level-bottomed drill hole (Drawing 1)
  - Turning internal contours (Drawing 2)
  - Turning of flat contours (Drawing 3)
  - Turning external contours (Drawing 4)
  - (Note change of rotational direction)
- Reduced storage of tools and indexable inserts, as well as reduced tooling times
- Reduction of tool costs
- Reduced programming effort and expense
- **Solves the problem of tool location shortages**

**Range expanded**

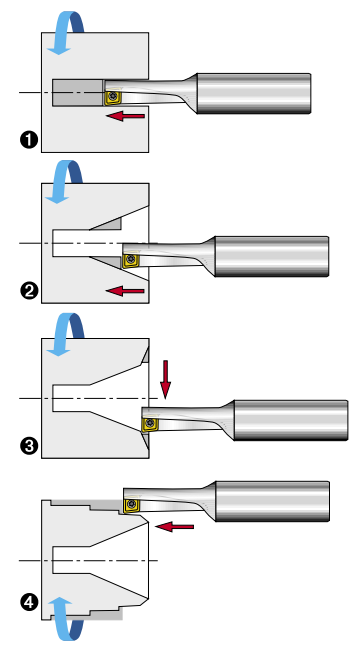


## 1.5 x D

D mm	D min. mm	D max. mm	L mm	L1 mm	f mm	D1 mm	suitable indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
8	7.85	8.3	80	12	4	12	XPNT 0402	A1	B1	129101 0080	130,50	129102 0080	130,50
10	9.85	10.5	90	15	5	12	XPNT 0502	A2	B1	129101 0100	132,50	129102 0100	132,50
12	11.85	12.5	100	18	6	16	XPNT 0602	A3	B2	129101 0120	136,50	129102 0120	136,50
14	13.85	14.5	110	21	7	16	XPNT 0703	A4	B3	129101 0140	136,50	129102 0140	140,50
16	15.85	16.5	125	24	8	20	XPNT 0803	A5	B4	129101 0160	147,50	129102 0160	151,-
18	17.85	18.5	135	27	9	25	XPNT 0904	A5	B4	129101 0180	154,-	129102 0180	158,-
20	19.8	20.5	150	30	10	25	XPNT 1004	A6	B5	129101 0200	170,-	129102 0200	174,-
25	24.8	25.8	180	37.5	12.5	32	XPNT 1305	A7	B6	129101 0250	182,50	129102 0250	186,50
32	31.8	33	200	48	16	40	XPNT 1706	A7	B6	129101 0320	192,50	129102 0320	192,50
1122											1122		

## 2.25 x D

D mm	D min. mm	D max. mm	L mm	L1 mm	f mm	D1 mm	suitable indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
8	7.85	8.3	60	18	4	10	XPNT 0402	A1	B1	129201 0080	182,50	129202 0080	182,50
10	9.85	10.5	69.5	22.5	5	12	XPNT 0502	A2	B1	129201 0100	184,50	129202 0100	184,50
12	11.85	12.5	78	27	6	16	XPNT 0602	A3	B2	129201 0120	187,50	129202 0120	187,50
14	13.85	14.5	83.5	31.5	7	16	XPNT 0703	A4	B3	129201 0140	189,50	129202 0140	193,50
16	15.85	16.5	94	36	8	20	XPNT 0803	A5	B4	129201 0160	199,50	129202 0160	204,-
18	17.85	18.5	109.5	40.5	9	25	XPNT 0904	A5	B4	129201 0180	204,-	129202 0180	209,-
20	19.8	20.5	111	45	10	25	XPNT 1004	A6	B5	129201 0200	204,-	129202 0200	209,-
25	24.8	25.8	129	56.5	12.5	32	XPNT 1304	A7	B6	129201 0250	219,-	129202 0250	224,-
32	31.8	33	158	72	16	40	XPNT 1706	A7	B6	129201 0320	250,-	129202 0320	255,-
1122											1122		



## Spare parts

	Screw		TORX PLUS		
	art.no.	€	art.no.	€	
A1	129380 0618	5,05	B1	705145 0006	6,75
A2	129380 0620	5,05	B2	705145 0007	6,75
A3	129380 0722	5,05	B3	705145 0008	6,75
A4	129380 0825	5,05	B4	705145 0009	7,20
A5	129380 0930	5,05	B5	705145 0015	7,65
A6	129380 1535	10,15	B6	705145 0020	8,15
A7	129380 2045	10,15			
1123					7113

## Indexable inserts XPET

- ground and polished



**NEW** ISO **N**

ISO designation		SW200 art.no.	€
XPET 050204 FN	10	129400 0001	15,25
XPET 060204 FN	10	129400 0002	16,90
XPET 070304 FN	10	129400 0003	16,90
XPET 080304 FN	10	129400 0004	16,90
XPET 09T304 FN	10	129400 0005	17,40
XPET 10T304 FN	10	129400 0006	19,25
XPET 130404 FN	10	129400 0007	21,30
XPET 170508 FN	10	129400 0008	22,70
1123			

## XPNT indexable inserts

- **XPNT 0402:** right holder = right indexable insert ER, left holder = left indexable insert EL



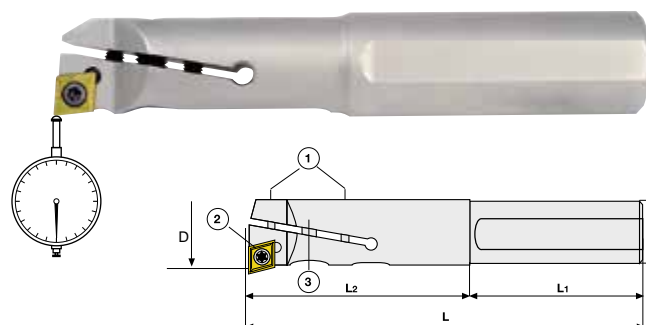
ISO designation	ISO <b>P M S</b>		ISO <b>P K</b>			
	art.no.	€	art.no.	€		
XPNT 040204 EL	10	129300 0002	10,45	10	129350 0002	10,45
XPNT 040204 ER	10	129300 0001	10,45	10	129350 0001	10,45
XPNT 050204 EN	10	129300 0003	10,45	10	129350 0003	10,45
XPNT 060204 EN	10	129300 0004	11,40	10	129350 0004	11,40
XPNT 070304 EN	10	129300 0005	11,40	10	129350 0005	11,40
XPNT 080304 EN	10	129300 0006	11,65	10	129350 0006	11,65
XPNT 090404 EN	10	129300 0007	11,80	10	129350 0007	11,80
XPNT 100404 EN	10	129300 0008	13,05	10	129350 0008	13,05
XPNT 100408 EN	10	129300 0009	13,05	10	129350 0009	13,05
XPNT 130504 EN	10	129300 0010	14,45	10	129350 0010	14,45
XPNT 130508 EN	10	129300 0011	14,45	10	129350 0011	14,45
XPNT 170608 EN	10	129300 0012	15,40	10	129350 0012	15,40
1123					1123	

## ATORN® Adjustable precision boring bars



- Nickel-plated version
- Adjusting range 2 - 5 mm
- **For ISO indexable cutting inserts CCMT and CCGT**
- Cost-efficient alternative to spindle tools
- **Other diameters and versions available on request**

**The cost-efficient alternative to spindle tools**



1 = adjusting screw, 2 = indexable insert screw, 3 = counter screw

D min. mm	D max. mm	L mm	L1 mm	L2 mm	d mm	suitable indexable inserts	suitable regulation screw	suitable lock screw			art.no.	€
10	12	100	70	30	10	CC..0602..	RE 1	BL 0	A1	B1	<b>323001</b> 1012	226,-
12	15	105	65	40	12	CC..0602..	RE 1	BL 1	A1	B1	323001 1215	244,-
15	20	110	60	50	16	CC..0602..	RE 2	BL 2	A1	B1	323001 1520	248,-
20	25	120	60	60	20	CC..0602..	RE 3	BL 3	A1	B1	323001 2025	270,-
25	30	140	70	70	25	CC..09T3..	RE 4	BL 4	A2	B2	323001 2530	280,-
30	35	160	70	90	25	CC..09T3..	RE 5	BL 5	A2	B2	323001 3035	301,-
35	40	170	70	100	32	CC..09T3..	RE 6	BL 6	A2	B2	323001 3540	355,-
40	45	190	70	120	32	CC..09T3..	RE 7	BL 7	A2	B2	323001 4045	380,-
45	50	220	70	150	32	CC..09T3..	RE 8	BL 8	A2	B2	323001 4550	430,-

3104

### Regulation screw

Designation	for Ø mm	art.no.	€
RE 1	10-15	<b>323002</b> 0002	5,35
RE 2	15-20	323002 0003	5,35
RE 3	20-25	323002 0004	5,35
RE 4	25-30	323002 0005	5,35
RE 5	30-35	323002 0006	5,35
RE 6	35-40	323002 0007	5,35
RE 7	40-45	323002 0008	5,35
RE 8	45-50	323002 0009	5,35

3106

**For ISO indexable inserts, please refer to the "Turning" section**

### Counter screw

Designation	for Ø mm	art.no.	€
BL 0	10-12	<b>323003</b> 0001	6,50
BL 1	12-15	323003 0002	6,50
BL 2	15-20	323003 0003	6,50
BL 3	25-30	323003 0004	6,50
BL 4	25-30	323003 0005	6,50
BL 5	30-35	323003 0006	7,10
BL 6	35-40	323003 0007	7,10
BL 7	40-45	323003 0008	8,-
BL 8	45-50	323003 0009	8,-

3106

### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1	262551 0025	5,45	B1	703053 0080	1,93
A2	262551 0035	7,95	B2	703053 0150	1,93

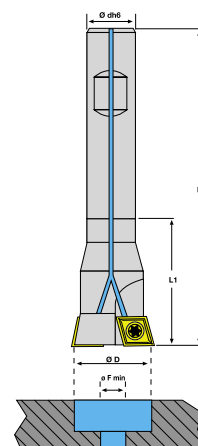
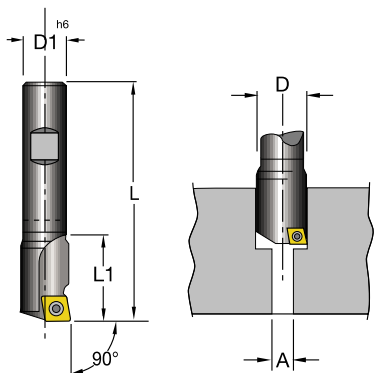
3106

7114

## ATORN® Core and countersink drill



- **With internal cooling**
- For countersinking and drilling
- Counterbores for producing countersinks for cylinder head screws, countersinks, sealing surfaces
- Fixed dimension spiral countersink for drilling pre-machined or cast bores
- **The diameter to be drilled must not be smaller than dimension A!**
- **Bore tolerances:** For countersinks according to DIN 74 (H13)
- For ISO indexable inserts, please refer to the "Turning" section



### Core and countersink drill bits with one indexable insert housing

D mm	L mm	L1 mm	D1 h6 mm	A mm	for indexable inserts	art.no.	€
10	85	15	12	4	CCMT 060204 A1 B1	164003 0100	90,60
11	85	15	12	4	CCMT 060204 A1 B1	164003 0110	90,60
12	85	18	12	4	CCMT 060204 A1 B1	164003 0120	90,60
13	85	23	12	5	CCMT 060204 A1 B1	164003 0130	92,60
14	85	23	12	5	CCMT 060204 A1 B1	164003 0140	92,60
15	85	30	12	5	CCMT 060204 A1 B1	164003 0150	90,60
16	85	30	12	5	CCMT 060204 A1 B1	164003 0160	93,60
17	95	30	16	6	CCMT 09T304 A2 B2	164003 0170	122,50
18	95	40	16	6	CCMT 09T304 A2 B2	164003 0180	120,50
19	95	40	16	6	CCMT 09T304 A2 B2	164003 0190	124,50
20	95	40	16	5	CCMT 09T304 A2 B2	164003 0200	142,-
21	95	42	16	5	CCMT 09T304 A2 B2	164003 0210	144,-
22	95	42	16	6	CCMT 09T304 A2 B2	164003 0220	144,-
23	95	42	16	6	CCMT 09T304 A2 B2	164003 0230	144,-
24	95	42	16	6	CCMT 09T304 A2 B2	164003 0240	146,-
25	95	42	16	8	CCMT 09T304 A2 B2	164003 0250	144,-
26	120	56	20	8	CCMT 09T304 A2 B2	164003 0260	156,-
27	120	56	20	9	CCMT 09T304 A2 B2	164003 0270	158,-
28	120	56	20	10	CCMT 09T304 A2 B2	164003 0280	158,-
29	120	56	20	11	CCMT 09T304 A2 B2	164003 0290	158,-
30	120	56	20	12	CCMT 09T304 A2 B2	164003 0300	158,-
31	120	56	20	12	CCMT 09T304 A2 B2	164003 0310	158,-
32	120	56	20	13	CCMT 09T304 A2 B2	164003 0320	158,-
33	120	56	20	14	CCMT 09T304 A2 B2	164003 0330	158,-

1132

### Core and countersink drill bits with two indexable insert housings

D mm	L mm	L1 mm	D1 h6 mm	A mm	for indexable inserts	art.no.	€
16	92	30	12	5	CCMT 060204 A1 B1	164005 0016	171,50
17	94	32	16	6	CCMT 060204 A1 B1	164005 0017	171,50
18	97	41	16	7	CCMT 060204 A1 B1	164005 0018	176,50
19	100	41	16	8	CCMT 060204 A1 B1	164005 0019	176,50
20	102	41	16	9	CCMT 060204 A1 B1	164005 0020	202,-
21	105	41	16	10	CCMT 060204 A1 B1	164005 0021	202,-
22	110	41	16	11	CCMT 060204 A1 B1	164005 0022	214,-
23	112	41	16	12	CCMT 060204 A1 B1	164005 0023	214,-
24	115	41	16	13	CCMT 060204 A1 B1	164005 0024	214,-
25	120	40	16	8	CCMT 09T304 A2 B2	164005 0025	237,-
26	125	55	20	9	CCMT 09T304 A2 B2	164005 0026	237,-
27	128	55	20	10	CCMT 09T304 A2 B2	164005 0027	237,-
28	130	55	20	11	CCMT 09T304 A2 B2	164005 0028	237,-
29	132	55	20	12	CCMT 09T304 A2 B2	164005 0029	251,-
30	134	55	20	13	CCMT 09T304 A2 B2	164005 0030	251,-
31	136	55	20	14	CCMT 09T304 A2 B2	164005 0031	251,-
32	138	55	20	15	CCMT 09T304 A2 B2	164005 0032	251,-
33	140	55	20	16	CCMT 09T304 A2 B2	164005 0033	251,-
34	140	60	25	16	CCMT 09T304 A2 B2	164005 0034	251,-
35	140	60	25	17	CCMT 09T304 A2 B2	164005 0035	251,-
36	140	60	25	18	CCMT 09T304 A2 B2	164005 0036	251,-
37	140	60	25	19	CCMT 09T304 A2 B2	164005 0037	251,-
38	140	60	25	20	CCMT 09T304 A2 B2	164005 0038	251,-
39	140	60	25	21	CCMT 09T304 A2 B2	164005 0039	275,-
40	140	60	25	22	CCMT 09T304 A2 B2	164005 0040	275,-
41	140	60	25	23	CCMT 09T304 A2 B2	164005 0041	275,-
42	140	60	25	24	CCMT 09T304 A2 B2	164005 0042	275,-
43	150	70	25	24	CCMT 120404 A2 B2	164005 0043	375,-
44	150	70	25	24	CCMT 120404 A2 B2	164005 0044	375,-
45	150	70	25	24	CCMT 120404 A2 B2	164005 0045	375,-
46	150	70	25	24	CCMT 120404 A2 B2	164005 0046	375,-
47	150	70	25	24	CCMT 120404 A2 B2	164005 0047	385,-
48	150	70	25	24	CCMT 120404 A2 B2	164005 0048	385,-

1132

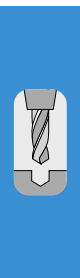
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 262551 0025	5,45		B1 703053 0080	1,93	
A2 320901 2502	11,65		B2 703053 0150	1,93	
3106			7114		

## ATORN® Fixed dimension core drill bit

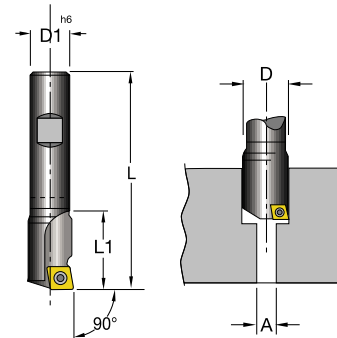


- With internal cooling
- Fixed dimension spiral countersink for drilling pre-machined or cast bores
- **The diameter to be drilled must not be smaller than dimension A!**
- **Bore tolerances:** H13
- For ISO indexable inserts, please refer to the "Turning" section



D mm	L mm	L1 mm	D1 h6 mm	A mm	for indexable inserts			art.no.	€
9.8	90	23	8	4.5	CCMT 060204	A1	B1	164001 0098	89,50
10.8	105	24	10	3.5	CCMT 060204	A1	B1	164001 0108	89,50
11.8	105	25	10	3	CCMT 060204	A1	B1	164001 0118	89,50
12.8	105	26	10	2.5	CCMT 060204	A1	B1	164001 0128	89,50
13.8	110	27	12	3	CCMT 060204	A1	B1	164001 0138	89,50
14.8	120	28	12	3.5	CCMT 060204	A1	B1	164001 0148	93,10
15.8	125	29	12	4	CCMT 060204	A1	B1	164001 0158	93,10
16.8	140	30	16	5	CCMT 060204	A1	B1	164001 0168	110,-
17.8	140	31	16	6	CCMT 060204	A1	B1	164001 0178	110,-
18.8	150	32	16	7	CCMT 060204	A1	B1	164001 0188	110,-
19.8	150	33	16	8	CCMT 09T304	A1	B2	164001 0198	110,-
20.8	160	34	16	9	CCMT 09T304	A2	B2	164001 0208	110,-
21.8	160	35	20	10	CCMT 09T304	A2	B2	164001 0218	110,-
22.8	165	36	20	11	CCMT 09T304	A2	B2	164001 0228	134,-
23.8	170	37	20	12	CCMT 09T304	A2	B2	164001 0238	134,-
24.8	180	38	20	13	CCMT 09T304	A2	B2	164001 0248	134,-
25.8	185	39	20	14	CCMT 09T304	A2	B2	164001 0258	134,-
26.8	190	40	20	15	CCMT 09T304	A2	B2	164001 0268	134,-
27.8	190	41	20	16	CCMT 09T304	A2	B2	164001 0278	134,-
28.8	200	42	20	17	CCMT 09T304	A2	B2	164001 0288	134,-
29.8	200	43	25	18	CCMT 09T304	A2	B2	164001 0298	134,-
30.8	200	44	25	19	CCMT 09T304	A2	B2	164001 0308	171,-
31.8	200	45	25	20	CCMT 09T304	A2	B2	164001 0318	171,-

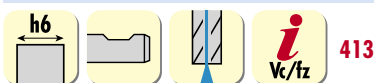
1132



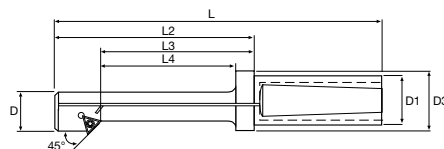
### Spare parts

	Screw			TORX		
	art.no.	€		art.no.	€	
A1	262551 0025	5,45	B1	703053 0080	1,93	
A2	320901 2502	11,65	B2	703053 0150	1,93	
	3106			7114		

## ATORN® Reverse countersink 45°



- For rotating use with stationary workpieces
- **For ISO indexable cutting inserts (TCMT 0802.. and TCMT 1102..)**
- With internal cooling, (Ø1.5 mm without internal cooling)
- Straight shank with clamping surface (Whistle notch)



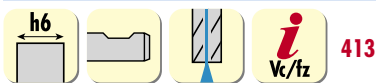
D mm	D min. mm	L mm	D3 mm	L2 mm	L3 mm	L4 mm	D1 h6 mm	E mm	for indexable inserts			art.no.	€
15	10	105	25	55	42	35	20	2.7	TCMT 0802..	A1	B1	152504 0150	260,-
20	14	110	25	60	47	40	20	3.2	TCMT 0802..	A1	B1	152504 0200	260,-
23	17	120	25	70	57	50	20	3.2	TCMT 1102..	A2	B2	152504 0230	275,-
27	21	140	25	90	77	70	20	3.2	TCMT 1102..	A2	B2	152504 0270	285,-
31	24	150	25	100	87	80	20	3.7	TCMT 1102..	A2	B2	152504 0310	321,-

1132

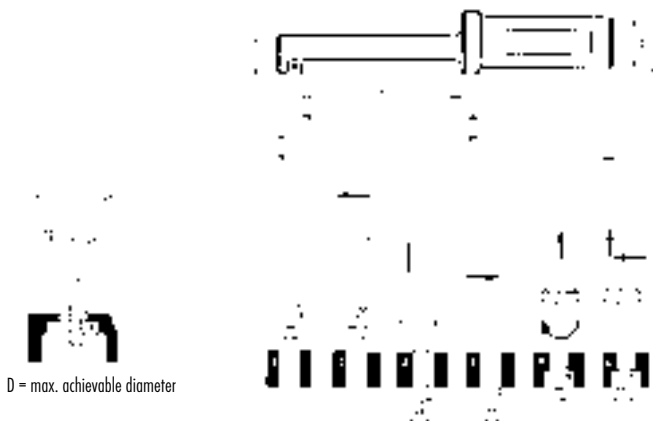
### Spare parts

	Screw			TORX		
	art.no.	€		art.no.	€	
A1	152599 0001	5,95	B1	703053 0070	1,93	
A2	262551 0025	5,45	B2	703053 0080	1,93	
	3106			7114		

## ATORN® 180° reverse countersink



- For rotating use with stationary workpieces
- **For ISO indexable cutting inserts (CPMT or CCM and CCG)**
- With internal cooling, (Ø15 and Ø18 without internal cooling)
- Straight shank with clamping surface (Whistle notch)
- D5 = maximum countersink diameter



1. Positioning: pay attention to the cutting edge position!
2. Move from the centre to the cutting edge opposite "E".
3. Move eccentrically through the bore.
4. Move back to the centre.
5. Reverse countersink with speed "N" and feed "F".
6. Move from the centre to the cutting edge opposite "E" and retract from the hole.

D mm	D min. mm	L mm	D3 mm	L2 mm	L3 mm	L4 mm	D1 mm	E mm	for indexable inserts	Clamping screw	Wrench dimension	art.no.	€
15	8.5	105	25	55	42	35	20	3.50	CPMT05T1..	M2.2 x 6	T7	A1 B1	152501 0150 200,-
18	10.5	112	25	62	47	40	20	4.00	CC..0602..	M2.5 x 6	T8	A2 B2	152501 0180 161,-
20	13.0	117	25	67	52	45	20	3.75	CC..0602..	M2.5 x 6	T8	A2 B2	152501 0200 177,50
24	15.0	122	25	72	57	50	20	4.75	CC..0602..	M2.5 x 6	T8	A2 B2	152501 0240 191,50
26	17.0	132	25	82	67	60	20	5.00	CC..0602..	M2.5 x 6	T8	A2 B2	152501 0260 207,-
30	19.0	142	25	92	77	65	20	6.00	CC..0602..	M2.5 x 6	T8	A2 B2	152501 0300 225,-
33	21.0	152	25	102	82	75	20	6.50	CC..09T3..	M4 x 8	T15	A3 B3	152501 0330 262,-
36	23.0	173	40	113	93	85	32	7.00	CC..09T3..	M4 x 8	T15	A3 B3	152501 0360 294,-
40	25.0	183	40	123	103	95	32	8.00	CC..09T3..	M4 x 8	T15	A3 B3	152501 0400 317,-
43	30.0	183	40	123	103	95	32	7.00	CC..09T3..	M4 x 8	T15	A3 B3	152501 0430 348,-
48	33.0	223	40	163	143	135	32	8.00	CC..09T3..	M4 x 8	T15	A3 B3	152501 0480 365,-
53	36.0	210	-	140	-	110	40	9.00	CC..1204..	M5 x 11	T20	A3 B3	152501 0530 395,-
57	39.0	220	-	150	-	120	40	9.50	CC..1204..	M5 x 11	T20	A3 B3	152501 0570 410,-
66	45.0	245	-	165	-	135	50	11.00	CC..1204..	M5 x 11	T20	A3 B3	152501 0660 435,-
76	52.0	265	-	185	-	155	50	12.50	CC..1204..	M5 x 11	T20	A3 B3	152501 0760 480,-

1132

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	152599 0001	5,95	B1	703053 0060	1,93
A2	262551 0025	5,45	B2	703053 0080	1,93
A3	320901 2502	11,65	B3	703053 0150	1,93
3106			7114		

## ATORN® Indexable cutting inserts for reverse countersinks

- Carbide indexable cutting inserts, positive 7°
- **HC4635** - PVD-coated for universal applications

### CPMT 05T104

- For reverse countersink 180°

ISO designation	ISO P M K	HC 4635	art.no.	€
CPMT 05T104	10	331260 0032	14,75	

1132

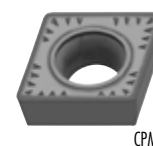
### TCMT 080204

- For reverse countersink 45°

ISO designation	ISO P M K	HC4635	art.no.	€
TCMT 080204	10	331261 0032	20,30	

1132

For further ISO indexable inserts, please refer to the "Turning" section



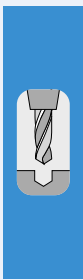
CPMT



TCMT

## Overview of hand taps

Sorting by thread	Sets											
Brand	ATORN®	ATORN®	SARA®	ATORN®	ATORN®	SARA®	ATORN®	SARA®	ATORN®	ATORN®	ATORN®	ATORN®
Thread	M	M	M	M-LH	M	M	MF	MF	UNC	UNF	BSW	G
ISO												
Type	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole
Range	M1 - M42	M2 - M20	M2 - M52	M4 - M20	M2 - M12	M3 - M16	M4 - M36	M3 - M36	3-48/7/8"-9	4-48 5/8"-18	W1/8"-W3/4"	61/8"-G3/4"
Tolerance	6H	6H	6H	6H	6H	6H	6H	6H	2B	2B		
Set	3-pcs.	3-pcs.	3-pcs.	3-pcs.	3-pcs.	3-pcs.	2-pcs.	2-pcs.	3-pcs.	2-pcs.	3-pcs.	2-pcs.
DIN	352	352	352	352	352	352	2181	2181	351	2181	351	5157
Cutting material	HSS	HSS-E	HSS	HSS	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS
Surface treatment	blank	blank	blank	blank	Nitrided	Vapour-treated	blank	blank	blank	blank	blank	blank
Item number	130130....	130126....	130101....	130134....	130135....	130110....	130139....	130105....	130140....	130141....	130142....	130143....
Page	226	226	226	228	228	228	227	227	229	229	230	230



### ATORN® The ISO colour ring system

ATORN taps and thread formers are marked with coloured rings in accordance with the ISO colour code according to their **main area of use**. The respective secondary applications are specified in the catalogue.

<b>Steel up to 1,000 N/mm<sup>2</sup></b>
<b>Stainless steel</b>
<b>GG, GGG</b>
<b>Aluminium and copper alloys, long-chipping materials</b>
<b>Titanium and nickel alloys</b>
<b>Hard steel up to 62 HRc</b>
<b>Steel up to 1,400 N/mm<sup>2</sup></b>
<b>Steel Stainless steel</b>

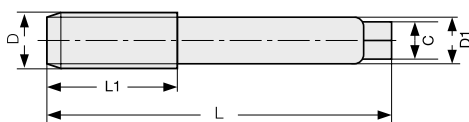




## ATORN® SARA® Hand taps



- ISO metric thread, DIN 13
- Cutting material: HSS
- For through-hole and blind bore threads
- 3 pcs set comprising taper tap, second tap and bottom tap

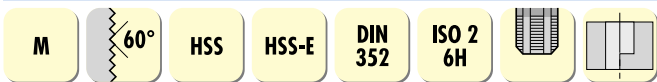


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	G6/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc

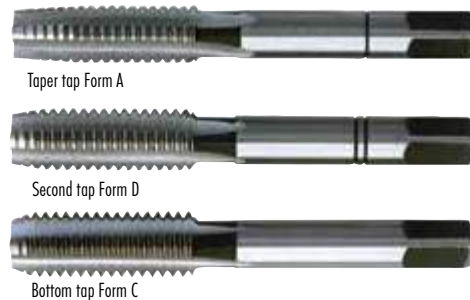
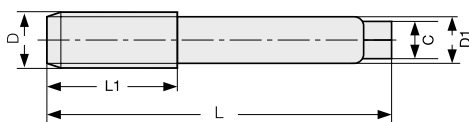
ATORN®							SARA®		
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	3-pcs. set art.no.	€	3-pcs. set art.no.	€
M 1	0.25	32	5.5	2.5	2.1	130130 0010	74,80		
M 1.2	0.25	32	5.5	2.5	2.1	130130 0012	65,10		
M 1.4	0.3	32	7	2.5	2.1	130130 0014	67,70		
M 1.6	0.35	32	8	2.5	2.1	130130 0016	61,60		
M 1.7	0.35	32	8	2.5	2.1	130130 0017	58,-		
M 1.8	0.35	32	8	2.5	2.1	130130 0018	61,60		
M 2	0.4	36	10	2.8	2.1	130130 0020	35,10	130101 0020	24,10
M 2.2	0.45	36	11	2.8	2.1			130101 0022	26,90
M 2.3	0.4	36	11	2.8	2.1	130130 0023	42,80	130101 0023	26,10
M 2.5	0.45	40	12	2.8	2.1	130130 0025	33,70	130101 0025	24,10
M 2.6	0.45	40	12	2.8	2.1	130130 0026	38,-	130101 0026	23,-
M 3	0.5	40	12	3.5	2.7	130130 0030	25,30	130101 0030	13,95
M 3.5	0.6	45	14	4	3	130130 0035	33,50	130101 0035	20,50
M 4	0.7	45	14	4.5	3.4	130130 0040	23,50	130101 0040	13,95
M 4.5	0.75	45	14	4.5	3.4	130130 0045	37,10	130101 0045	20,50
M 5	0.8	48	16	6	4.9	130130 0050	24,30	130101 0050	14,20
M 6	1	50	18	6	4.9	130130 0060	25,70	130101 0060	14,70

ATORN®							SARA®		
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	3-pcs. set art.no.	€	3-pcs. set art.no.	€
M 7	1	50	18	6	4.9	130130 0070	32,70	130101 0070	23,-
M 8	1.25	56	22	6	4.9	130130 0080	29,30	130101 0080	19,25
M 9	1.25	63	22	7	5.5	130130 0090	51,40	130101 0090	24,10
M 10	1.5	70	25	7	5.5	130130 0100	36,50	130101 0100	24,40
M 11	1.5	70	25	8	6.2	130130 0110	63,10	130101 0110	46,70
M 12	1.75	75	30	9	7	130130 0120	48,10	130101 0120	31,10
M 14	2	80	32	11	9	130130 0140	56,50	130101 0140	33,20
M 16	2	80	32	12	9	130130 0160	80,90	130101 0160	52,-
M 18	2.5	95	40	14	11	130130 0180	111,-	130101 0180	55,90
M 20	2.5	95	40	16	12	130130 0200	112,-	130101 0200	75,40
M 22	2.5	100	40	18	14.5			130101 0220	91,50
M 24	3	110	50	18	14.5	130130 0240	156,-	130101 0240	105,-
M 27	3	110	50	20	16			130101 0270	137,-
M 30	3.5	132	56	22	18			130101 0300	164,50
M 33	3.5	132	56	25	20			130101 0330	216,-
M 36	4	150	63	28	22	130130 0360	410,-	130101 0360	273,-
M 42	4.5	150	63	32	24	130130 0420	599,-		

## ATORN® Hand taps



- ISO metric thread, DIN 13
- Cutting material: HSS
- For through-hole and blind bore threads
- 3 pcs set comprising taper tap, second tap and bottom tap



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	G6/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	3-pcs. set art.no.	€	Taper tap art.no.	€	Second tap art.no.	€	Bottom tap art.no.	€
M 2	0.4	36	10	2.8	2.1	130126 0020	89,60	130127 0020	30,30	130128 0020	30,30	130129 0020	30,30
M 2.5	0.45	40	12	2.8	2.1	130126 0025	80,-	130127 0025	26,90	130128 0025	26,90	130129 0025	26,90
M 3	0.5	40	12	3.5	2.7	130126 0030	63,10	130127 0030	21,60	130128 0030	21,60	130129 0030	21,60
M 3.5	0.6	45	14	4	3	130126 0035	73,60	130127 0035	25,-	130128 0035	25,-	130129 0035	25,-
M 4	0.7	45	14	4.5	3.4	130126 0040	63,10	130127 0040	21,60	130128 0040	21,60	130129 0040	21,60
M 5	0.8	48	16	6	4.9	130126 0050	69,10	130127 0050	23,50	130128 0050	23,50	130129 0050	23,50
M 6	1	50	18	6	4.9	130126 0060	69,70	130127 0060	23,60	130128 0060	23,60	130129 0060	23,60
M 8	1.25	56	22	6	4.9	130126 0080	76,-	130127 0080	26,-	130128 0080	26,-	130129 0080	26,-
M 10	1.5	70	25	7	5.5	130126 0100	99,90	130127 0100	34,10	130128 0100	34,10	130129 0100	34,10
M 12	1.75	75	30	9	7	130126 0120	127,50	130127 0120	43,30	130128 0120	43,30	130129 0120	43,30
M 16	2	80	32	12	9	130126 0160	199,50	130127 0160	67,70	130128 0160	67,70	130129 0160	67,70
M 20	2.5	95	40	16	12	130126 0200	307,-	130127 0200	103,-	130128 0200	103,-	130129 0200	103,-

## ATORN® Hand tap set



- For DIN 13 metric thread
- For through-hole and blind bore threads
- **21 pcs**, with case, M3 - 12
- **Cutting material: HSS and HSS-E**
- Consisting of DIN 352 taper tap, second tap and bottom tap



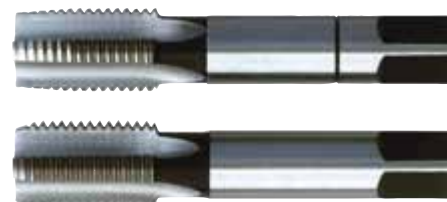
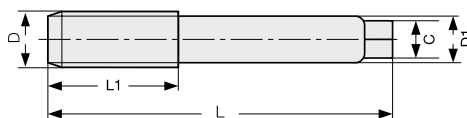
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
130130....	●	●	●					○	○				○	○	○					
130126....	●	●	●		●	●	○	○	○				○	○	○					

Contents		HSS		HSS-E	
		art.no.	€	art.no.	€
Hand taps DIN 352, M3-4-5-6-8-10-12 (1 set of each)		<b>130130</b> 1001	<b>250,-</b>	<b>130126</b> 1001	<b>470,-</b>
		1125		1125	

## ATORN® SARA® Hand taps



- **ISO 6H fine-pitch metric thread, DIN 13**
- 2 pcs set consisting of taper tap and bottom tap
- **Cutting material: HSS**
- For through-hole and blind bore threads
- Individual taps available on request



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●					○	○				○	○	○					

		ATORN®		SARA®					
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	art.no.	€	art.no.	€
M 3	0.35	40	9	3.5	2.7			<b>130105</b> 0005	<b>18,95</b>
M 3.5	0.35	45	10	4	3			130105 0006	<b>30,70</b>
M 4	0.5	45	10	4.5	3.4	<b>130139</b> 0007	<b>27,40</b>	130105 0007	<b>20,40</b>
M 5	0.5	50	12	6	4.9	130139 0009	<b>28,40</b>	130105 0009	<b>14,75</b>
M 6	0.5	50	12	6	4.9	130139 0054	<b>32,30</b>		
M 6	0.75	50	12	6	4.9	130139 0010	<b>28,70</b>	130105 0010	<b>14,20</b>
M 7	0.75	50	14	6	4.9	130139 0011	<b>34,90</b>	130105 0011	<b>27,70</b>
M 8	0.5	50	16	6	4.9	130139 0055	<b>37,30</b>		
M 8	0.75	50	16	6	4.9	130139 0013	<b>33,90</b>	130105 0013	<b>19,05</b>
M 8	1	56	16	6	4.9	130139 0012	<b>28,40</b>	130105 0012	<b>17,60</b>
M 9	1	63	16	7	5.5			130105 0014	<b>33,60</b>
M 10	0.75	63	16	7	5.5	130139 0017	<b>44,40</b>	130105 0017	<b>34,70</b>
M 10	1	63	16	7	5.5	130139 0016	<b>30,70</b>	130105 0016	<b>20,30</b>
M 10	1.25	70	20	7	5.5	130139 0015	<b>36,30</b>	130105 0015	<b>20,80</b>
M 11	1	63	16	8	6.2			130105 0018	<b>42,10</b>
M 12	0.75	63	20	9	7			130105 0022	<b>42,10</b>
M 12	1	63	20	9	7	130139 0021	<b>36,10</b>	130105 0021	<b>24,90</b>
M 12	1.25	63	20	9	7	130139 0020	<b>45,90</b>	130105 0020	<b>25,80</b>
M 12	1.5	75	20	9	7	130139 0019	<b>35,40</b>	130105 0019	<b>24,20</b>
M 14	1	70	20	11	9	130139 0025	<b>52,40</b>	130105 0025	<b>39,50</b>
M 14	1.25	70	20	11	9	130139 0024	<b>55,50</b>	130105 0024	<b>31,20</b>
M 14	1.5	70	20	11	9	130139 0023	<b>44,-</b>	130105 0023	<b>30,60</b>
M 15	1	70	20	12	9	130139 0027	<b>63,10</b>	130105 0027	<b>49,10</b>
M 15	1.5	70	20	12	9			130105 0026	<b>49,10</b>

1125

1133

		ATORN®		SARA®					
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	art.no.	€	art.no.	€
M 16	1	70	20	12	9	130139 0030	<b>60,60</b>	130105 0030	<b>39,50</b>
M 16	1.25	70	20	12	9			130105 0029	<b>54,-</b>
M 16	1.5	70	20	12	9	130139 0028	<b>51,40</b>	130105 0028	<b>41,40</b>
M 18	1	80	20	14	11	130139 0032	<b>80,90</b>	130105 0032	<b>58,-</b>
M 18	1.5	80	20	14	11	130139 0031	<b>71,70</b>	130105 0031	<b>52,40</b>
M 20	1	80	22	16	12	130139 0034	<b>89,50</b>	130105 0034	<b>65,70</b>
M 20	1.5	80	22	16	12	130139 0033	<b>69,70</b>	130105 0033	<b>57,50</b>
M 22	1	80	22	18	14.5			130105 0036	<b>76,-</b>
M 22	1.5	80	22	18	14.5	130139 0035	<b>93,60</b>	130105 0035	<b>68,40</b>
M 24	1	80	22	18	14.5	130139 0039	<b>126,50</b>	130105 0039	<b>84,30</b>
M 24	1.5	80	22	18	14.5	130139 0038	<b>103,-</b>	130105 0038	<b>81,70</b>
M 24	2	80	22	18	14.5	130139 0037	<b>107,-</b>	130105 0037	<b>84,30</b>
M 25	1.5	80	22	18	14.5			130105 0041	<b>138,-</b>
M 26	1.5	80	22	18	14.5			130105 0042	<b>90,50</b>
M 27	1.5	90	22	20	16			130105 0044	<b>156,50</b>
M 27	2	90	22	20	16	130139 0043	<b>154,-</b>	130105 0043	<b>114,-</b>
M 28	1.5	90	22	20	16			130105 0046	<b>104,-</b>
M 28	2	90	22	20	16			130105 0045	<b>167,50</b>
M 30	1.5	90	22	22	18	130139 0048	<b>168,-</b>	130105 0048	<b>135,-</b>
M 30	2	90	22	22	18	130139 0047	<b>185,50</b>	130105 0047	<b>147,-</b>
M 32	1.5	90	22	22	18			130105 0050	<b>182,50</b>
M 36	1.5	100	25	28	22	130139 0056	<b>250,-</b>		
M 36	2	100	25	28	22			130105 0052	<b>252,-</b>
M 36	3	150	63	28	22			130105 0051	<b>252,-</b>

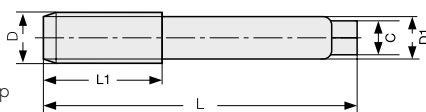
1125

1133

## ATORN® SARA® Hand taps

M
60°
HSS-E
HSS-E
DIN 352
ISO 2 6H
Nit.
Vap.

- ISO metric thread DIN 13
- Cutting material: HSS-E, nitrided; HSS-E vapour-treated
- For through-hole and blind-hole threads
- 3-pcs. set consisting of taper tap, second tap and bottom tap
- Up to M12 (inclusive), taper tap with pilot pin



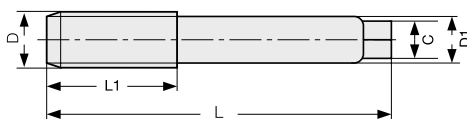
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
130135...	○	○	●	●				○	○				○	○	○					
130110...		●	●	○	●			●	○											

HSS-E							ATORN®		SARA®	
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	art.no.	Nitrided	€	art.no.	Vapour-treated
M 2	0.4	36	12	2.8	2.1	130135 0020	92,50			
M 3	0.5	40	12	3.5	2.7	130135 0030	61,70		130110 0030	43,10
M 4	0.7	45	14	4.5	3.4	130135 0040	60,70		130110 0040	43,10
M 5	0.8	48	16	6	4.9	130135 0050	69,90		130110 0050	45,50
M 6	1	50	18	6	4.9	130135 0060	69,90		130110 0060	45,50
M 8	1.25	56	22	6	4.9	130135 0080	73,-		130110 0080	52,40
M 10	1.5	70	25	7	5.5	130135 0100	98,70		130110 0100	64,60
M 12	1.75	75	30	9	7	130135 0120	134,-		130110 0120	96,20
M 14	2	80	32	11	9	130135 0140	153,50		130110 0140	96,20
M 16	2	80	32	12	9	130135 0160	197,50		130110 0160	131,50
							1125		1133	

## ATORN® Hand tap, left-hand thread

M-LH
60°
HSS
DIN 352
ISO 2 6H

- ISO left-hand metric thread, DIN 13
- 3 pcs set consisting of taper tap, second tap and bottom tap
- Cutting material: HSS
- For through-hole and blind bore threads



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●					○	○				○	○	○					

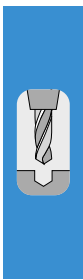
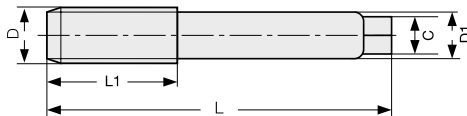
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	art.no.	€
M 4 - LH	0.7	45	14	4.5	3.4	130134 0040	104,-
M 5 - LH	0.8	48	16	6	4.9	130134 0050	109,-
M 6 - LH	1	50	18	6	4.9	130134 0060	115,-
M 8 - LH	1.25	56	22	6	4.9	130134 0080	132,50
M 10 - LH	1.5	70	25	7	5.5	130134 0100	157,-
M 12 - LH	1.75	75	30	9	7	130134 0120	204,-
M 14 - LH	2	80	32	11	9	130134 0140	245,-
M 16 - LH	2	80	32	12	9	130134 0160	301,-
M 20 - LH	2.5	95	40	16	12	130134 0200	355,-

1125

## ATORN® Hand taps



- **Whitworth thread, DIN 11**
- 3 pcs set consisting of taper tap, second tap and bottom tap
- **Cutting material: HSS**
- For through-hole and blind bore threads
- Individual taps available on request
- **Note:** For Whitworth threads in accordance with BSW standard BS 84 in medium tolerance zone.



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc

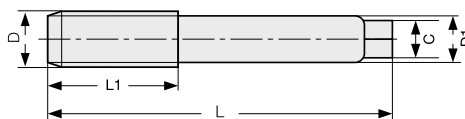
D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	art.no.	€
W 1/8"	40	40	12	3.5	2.7	130142 0002	30,30
W 5/32"	32	45	14	4.5	3.4	130142 0003	61,30
W 3/16"	24	45	14	5.5	4.3	130142 0004	56,50
W 7/32"	24	48	16	6	4.9	130142 0005	67,90
W 1/4"	20	50	18	6	4.9	130142 0006	28,30
W 5/16"	18	56	22	6	4.9	130142 0007	70,90
W 3/8"	16	63	22	7	5.5	130142 0008	48,10
W 1/2"	12	80	30	8	7	130142 0010	74,-
W 5/8"	11	80	32	12	9	130142 0012	104,50
W 3/4"	10	95	40	14	11	130142 0013	148,-

1125

## ATORN® Hand taps



- **Whitworth pipe thread, DIN 5157**
- 2 pcs set consisting of taper tap and bottom tap
- **Cutting material: HSS**
- For through-hole and blind bore threads
- Individual taps available on request
- **Note:** For straight pipe threads, DIN-ISO 228/1



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc

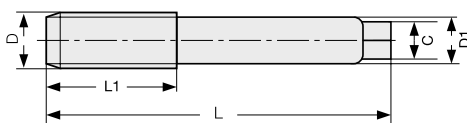
D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	art.no.	€
G 1/8"	28	63	20	7	5.5	130143 0001	31,30
G 1/4"	19	70	22	11	9	130143 0002	39,20
G 3/8"	19	70	22	12	9	130143 0003	56,50
G 1/2"	14	80	22	16	12	130143 0004	93,50
G 3/4"	14	90	22	20	16	130143 0006	144,-

1125

## ATORN® Hand taps

UNC 60° HSS DIN 351 2 B

- **UNC (unified national standard coarse-pitch thread)**
- 3 pcs set consisting of taper tap, second tap and bottom tap
- **Cutting material: HSS**
- For through-hole and blind bore threads



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●					○	○				○	○	○					

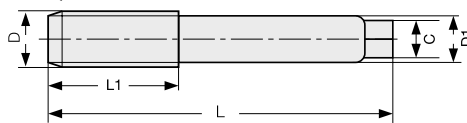
Size UNC	Pitch TPI	D mm	L mm	L1 mm	D1 mm	C mm	3-pcs. set	
							art.no.	€
3-48	48	2.52	40	9	2.8	2.1	130140 0001	48,10
4-40	40	2.85	40	11	3.5	2.7	130140 0002	26,80
5-40	40	3.18	40	11	3.5	2.7	130140 0003	36,60
6-32	32	3.51	45	12	4.0	3.0	130140 0004	26,80
8-32	32	4.17	45	13	4.5	3.4	130140 0005	26,80
10-24	24	4.83	50	14	6.0	4.9	130140 0006	26,80
1/4"-20	20	6.35	50	16	6.0	4.9	130140 0007	26,80
5/16"-18	18	7.94	56	18	6.0	4.9	130140 0008	27,90
3/8"-16	16	9.53	70	20	7.0	5.5	130140 0009	32,90
7/16"-14	14	11.11	75	22	8.0	6.2	130140 0010	42,60
1/2"-13	13	12.70	75	25	9.0	7.0	130140 0011	50,10
5/8"-11	11	15.88	80	30	12.0	9.0	130140 0012	71,30
3/4"-10	10	19.05	95	33	14.0	11.0	130140 0013	100,50
7/8"-9	9	22.23	100	35	18.0	14.5	130140 0014	147,-

1125

## ATORN® Hand taps

UNF 60° HSS DIN 2181 2 B

- **UNF (unified national standard fine-pitch thread)**
- 2 pcs set consisting of taper tap and bottom tap
- **Cutting material: HSS**
- For through-hole and blind bore threads








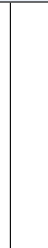







material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●					○	○				○	○	○					











Size UNF	Pitch TPI	D mm	L mm	L1 mm	D1 mm	C mm	2-piece set	
							art.no.	€
4-48	48	2.85	40	10	3.5	2.7	130141 0001	43,60
6-40	40	3.51	45	11	4.0	3.0	130141 0002	36,60
8-36	36	4.17	45	12	4.5	3.4	130141 0003	44,80
10-32	32	4.83	50	14	6.0	4.9	130141 0004	22,20
12-28	28	5.49	50	16	6.0	4.9	130141 0005	39,-
1/4"-28	28	6.35	50	17	6.0	4.9	130141 0006	30,60
5/16"-24	24	7.94	56	17	6.0	4.9	130141 0007	30,50
3/8"-24	24	9.53	63	18	7.0	5.5	130141 0008	35,70
7/16"-20	20	11.11	63	20	8.0	6.2	130141 0009	46,70
1/2"-20	20	12.70	63	20	9.0	7.0	130141 0010	55,30
9/16"-18	18	14.29	70	20	11.0	9.0	130141 0011	124,-
5/8"-18	18	15.88	70	20	12.0	9.0	130141 0012	115,-

1125

## Overview of machine taps

Sorting by thread and bore type												
Brand	ATORN	ATORN	ATORN	ATORN	ATORN						ATORN	ATORN
Thread	M	M	M	M	M	M	M	M	M	M	M	M
ISO	P	P M N	P M K N	P M K N	P M K N	P M N	P M N	P M S N	P M S N	P M S N	P M K N	P M K
Type	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole
Range	M2 - M16	M1 - M30	M3 - M16	M3 - M20	M3 - M20	M1 - M24	M3 - M16	M2 - M16	M3 - M16	M3 - M16	M2 - M30	M3 - M24
Tolerance	6H	6H	6H	6H	6H	6H	6H	6HX	6HX	6HX	6H	6H
DIN	352	371/376	Factory standard	371/376	371/376	371/376	371/376	371/376	371/376	371/376	371/376	371/376
Chamfer (form)	B	B	B	B	B	B	B	B	B	B	B	B
Possible thread depth	3xD	3xD	3xD	3xD	3xD	2.5xD	2.5xD	3xD	3xD	3xD	3xD	3xD
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E	HSS-E
Coating/surface treatment	Blank	Vapour-treated	Vapour-treated	TiAlN	TiAlN	Vapour-treated	Vapour-treated	TiCN	TiCN	TiCN	Blank	TiN
Type		UNI	UNI	ULTRA-HL	ULTRA-HL	S-POT	S-POT	A-POT	A-POT	A-Oil-POT		
Info			long				Weldon		Weldon	IC		
Item number	135360....	134700....	134785....	134755....	134745....	133875....	133878....	133450....	133495....	133456....	134105....	134110....
Page	239	235	236	238	238	262	263	258	259	260	241	241

Sorting by thread and bore type												
Brand	ATORN	SARA	ATORN	ATORN		ATORN	ATORN		ATORN	ATORN	SARA	ATORN
Thread	M	M	M-LH	M	M	M	M	M	M	M	M	M
ISO	P M K	P M K	P M K	P M K	P L	P M K	L	L	M	M	M	M
Type	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole
Range	M3 - M24	M3 - M12	M4 - M20 (LH)	M3 - M20	M2 - M30	M3 - M20	M3 - M12	M2 - M10	M2 - M20	M3 - M16	M3 - M12	M3 - M16
Tolerance	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H
DIN	371/376	371/376	371/376	WN	371/376	357	371/376	371	371/376	371/376	371/376	371/376
Chamfer (form)	B	B	B	B	B	20-thread	B	B	B	B	B	B
Possible thread depth	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-V3	HSS-E	HSS-E	HSS-E-V3	HSS-E	HSS-E	HSS-E	HSS-E
Coating/surface treatment	TiCN	Blank	Blank	Blank	Blank	Blank	Blank	Blank	Vapour-treated	TiN	Vapour-treated	Blank
Type					POT		ALU	AL-POT	VA	VA	VA	VA
Info			Left-hand thread	Extra-long		Long chamfer						Exp. thread ridges
Item number	134115....	134106....	134120....	134125....	133001....	135100....	134127....	133035....	134130....	134131....	134132....	135140....
Page	241	241	243	242	265	246	252	271	249	249	249	250

Sorting by thread and bore type												
Brand				ATORN	ATORN	SARA	ATORN	ATORN	ATORN		ATORN	ATORN
Thread	M	M	M	M	M	M	M	M	M	M	M	M
ISO	P M K S N	P M S N	P M K N	P M K S N	P M K S N	P M K S N	P M K N	P M K N	P M	P M K S N	S	P M K
Type	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Through-hole	Blind-hole/through-hole
Range	M2 - M20	M2 - M36	M2 - M16	M3 - M20	M3 - M20	M3 - M12	M3 - M24	M2 - M20	M3 - M16	M2 - M20	M3 - M16	M2 - M20
Tolerance	6HX	6H	6G	6H	6H	6H	6H	6H	6H	6HX	6H	6H
DIN	371/376	371/376	371/376	371/376	371/376	371/376	371/376	371/376	371/376	371/376	371/376	371/376
Chamfer (form)	B	B	B	B	B	B	B	B	B	B	C	C
Possible thread depth	3xD	2.5xD	2.5xD	3xD	3xD	3xD	3xD	3xD	3xD	2.5xD	3xD	1.5xD
Cutting material	HSS-E-V3	HSS-E-V3	HSS-E-V3	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E
Coating/surface treatment	CrN	Vapour-treated	Vapour-treated	Blank	TiCN	Blank	TiN	TiN	TiCN	TiCN	Blank	Blank
Type	CC-POT	VA-POT	VA-POT							Z-POT		
Info							Synchro	Synchro		Synchro		
Item number	133040....	133015....	133020....	134135....	134137....	134136....	135385....	134570....	134196....	133045....	134142....	135150....
Page	267	269	270	247	247	247	253	255	248	272	251	246






























Sorting by thread and bore type												
Brand	ATORN	ATORN		ATORN		ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	
Thread	M	M	M	M	M	M	M	M	M	M	M	M
ISO	K N	H	P H	H	H	P	P	P M N	P M K N	P M K N	P M K N	P M N
Type	Blind-hole/through-hole	Blind-hole/through-hole	Blind-hole/through-hole	Blind-hole/through-hole	Blind-hole/through-hole	Through-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole
Range	M3 - M24	M3 - M16	M3 - M12	M3 - M16	M3 - M12	M3 - M20	M3 - M20	M1 - M30	M3 - M16	M1 - M30	M3 - M20	M1 - M24
Tolerance	6HX	6HX	6HX	6H	6HX	6H	6H	6H	6H	6H	6H	6H
DIN	371/376	371/376	371/376	WN	WN	371/376	352	371/376	Factory standard	371/376	371/376	371/376
Chamfer (form)	C	D	C	D	C	D	C	C	C	C	C	C
Possible thread depth	3xD	1.5xD	1.5xD	1.5xD	1.5xD	3xD	2.5xD	2.5xD	2.5xD	2xD	2xD	2.5xD
Cutting material	HSS-E	HSS-E-PM	HSS-E-PM	Solid carbide	Solid carbide	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E
Coating/surface treatment	Nitrided	TiCN	TiCN	TiCN	TiCN	Blank	Blank	Vapour-treated /TiN	Vapour-treated	TiAlN	TiAlN	Vapour-treated
Type			V-XP-HAT		VX-OT			UNI	UNI	ULTRA-HL		S-SFT
Info						Left-hand twist		long				
Item number	135155...	135165...	133255...	135170...	133250...	135365...	135395...	134710...	134780...	134750...	134740...	133865...
Page	256	257	273	257	273	245	239	234	236	238	238	262

Sorting by thread and bore type												
Brand							ATORN	ATORN	ATORN	ATORN	ATORN	SARA
Thread	M	M	M	M	M	M	M	M	M	M	M	M
ISO	P M N	P M N	P M S N	P M S N	P M S N	P M S N	P M K	S	P M K	P M L	P M K	P M K
Type	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole
Range	M3 - M16	M3 - M16	M2 - M24	M3 - M16	M6 - M56	M3 - M16	M2 - M30	M3 - M16	M2 - M30	M2 - M30	M2 - M20	M3 - M12
Tolerance	6H	6H	6HX	6HX	6HX	6HX	6	6H	6H	6H	6H	6H
DIN	371/376	371/376	371/376	371/376	371/376	Solid carbide	371/376	371/376	371/376	371/376	371/376	371/376
Chamfer (form)	C	E	C	C	C	371/376	C	B	C	C	C	C
Possible thread depth	2.5xD	2.5xD	2xD	2xD	2.5xD	2xD	2.5xD	2.5xD	2.5xD	2.5xD	2.5xD	2.5xD
Cutting material	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E	HSS-E-PM	HSS-E	HSS-E	HSS-E	HSS-E
Coating/surface treatment	Vapour-treated	Vapour-treated	TiCN	TiCN	TiCN	TiCN	Blank / TiN	Blank	Blank	TiN	TiCN	Blank
Type	S-SFT	S-SFT	A-SFT	A-SFT	A-OIL-SFT	A-SFT		Ti				
Info	Weldon	Form E	Synchro	Weldon	IC	shape E						
Item number	133868...	133867...	133400....	133490....	133410/15....	133570...	134175....	134192....	134200....	134205....	134210....	134201....
Page	263	261	258	259	260	261	244	251	240	240	240	240

Sorting by thread and bore type												
Brand	ATORN	ATORN		ATORN			ATORN	ATORN	SARA	ATORN		
Thread	M-LH	M	M	M	M	M	M	M	M	M	M	M
ISO	P M K	P M K	P N	N	N	P M K S N	M	M	M	M	P M S N	P M S N
Type	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole
Range	M3 - M20	M3 - M20	M2 - M30	M2 - M12	M1.6 - M10	M2 - M36	M2 - M20	M3 - M16	M3 - M12	M3 - M20	M2 - M36	M2 - M16
Tolerance	6H	6H	6H	6H	6H	6HX	6H	6H	6H	6H	6H	6G
DIN	371/376	WN	371/376	371/376	371	371/376	371/376	371/376	371/376	371/376	371/376	371/376
Chamfer (form)	C	C	C	C	C	C	C	C	C	C	C	C
Possible thread depth	2.5xD	2.5xD	2.5xD	2.5xD	2.5xD	3xD	2.5xD	2.5xD	2.5xD	2.5xD	2.5xD	2.5xD
Cutting material	HSS-E	HSS-E	HSS-E-V3	HSS-E	HSS-E-V3	HSS-E-V3	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-V3	HSS-E-V3
Coating/surface treatment	Blank	Blank	Blank	Blank	Blank	CrN	Vapour-treated	TiN	Vapour-treated	Blank	Vapour-treated	Vapour-treated
Type			SFT	ALU	AL-SFT	CC-SFT	VA	VA	VA	VA	VA-SFT	VA-SFT
Info	Left-hand thread	Extra-long								Exp. thread ridges		
Item number	134215....	134220....	133101....	134195....	133145....	133106....	134225....	134226....	134227....	135390....	133125....	133130....
Page	243	242	264	252	271	266	249	249	249	250	268	270

Sorting by thread and bore type													
	Brand	ATORN	ATORN	ATORN	SARA	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN
	Thread	M	M	M	M	M	M	M	M	MF	MF	MF	MF
	ISO	PMS	PMKSN	PMKSN	PMKSN	PMKSN	P	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN
	Type	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Through-hole	Through-hole	Through-hole	Blind-hole / through-hole
	Range	M3 - M16	M3 - M20	M3 - M16	M3 - M12	M3 - M20	M3 - M24	M3 - M20	M4 - M20	M8 - M20	M3 - M40	M3 - M40	M3 - M36
	Tolerance	6H	6H	6H	6H	6H	6H	6H	6HX	6H	6H	6H	6H
	DIN	371/376	371/376	371/376	371/376	371/376	371/376	371/376	371/376	374	374	374	374
	Chamfer (form)	C	C	C	C	C	C	C	C	B	B	B	C
	Possible thread depth	3xD	2.5xD	2.5xD	2.5xD	2.5xD	2.5xD	2.5xD	2.5xD	3xD	3xD	3xD	1.5xD
	Cutting material	HSS-E-PM	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E	HSS-E	HSS-E	HSS-E
	Coating/surface treatment	TiCN	Blank	TiCN	Blank	Blank	TiN	TiCN	TiN	Vapour-treated	Blank	TiN	Blank
	Type							ZSFT		Universal			
Info						Synchro	Synchro	Synchro					
Item number	134193....	134230....	134233....	134231....	134235....	135350....	133155....	134575....	134765....	135255....	135260....	135265....	
Page	248	247	247	247	244	253	272	254	274	276	276	277	

Sorting by thread and bore type													
	Brand	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN
	Thread	MF	MF	MF	MF	MF	MF	MF	MF	MF	G	G	G
	ISO	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN
	Type	Through-hole	Through-hole	Through-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole / through-hole	Through-hole
	Range	M3 - M24	M3 - M24	M6 - M24	M8 - M20	M5 - M30	M6 - M20	M3 - M24	M3 - M24	M6 - M24	1/8" - 1 1/4"	1/8" - 1"	1/8" - 1"
	Tolerance	6H	6H	6HX	6H	6H	6H	6H	6H	6HX	ISO 228	ISO 228	ISO 228
	DIN	374	374	374	374	374	374	374	374	374	5156	5156	5156
	Chamfer (form)	B	B	B	C	C	C	C	C	C	B	C	B
	Possible thread depth	2.5xD	2.5xD	2.5xD	2xD	1.5xD	3xD	2.5xD	2.5xD	2xD	3xD	3xD	2.5xD
	Cutting material	HSS-E	HSS-E-V3	HSS-E-PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-V3	HSS-E-PM	HSS-E	HSS-E	HSS-E-PM
	Coating/surface treatment	Vapour-treated	Vapour-treated	TiCN	Vapour-treated	Vapour-treated	Vapour-treated/TiN	Vapour-treated	Vapour-treated	TiCN	Vapour-treated	Vapour-treated	TiCN
	Type	S-POT	VA-POT	A-POT	Universal			S-SFT	VA-SFT	A-SFT	Universal		A-POT
Info													
Item number	133975....	133505....	133460....	134760....	135280....	135285....	133965....	133515....	133420....	134775....	135295....	133900....	
Page	268	269	267	262	275	275	279	280	278	281	283	284	

Sorting by thread and bore type														
	Brand	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN
	Thread	G	G	G	G	G	G	G	UNC	UNC	UNF	UNF	NPT	PG
	ISO	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	PMKSN	P
	Type	Through-hole	Through-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Blind-hole	Through-hole	Blind-hole	Through-hole	Blind-hole	Blind-hole / through-hole	Through-hole
	Range	1/8" - 1"	1/8" - 1"	1/8" - 1 1/4"	1/8" - 1"	1/8" - 1"	1/8" - 1"	1/8" - 1"	1/4" - 1"	1/4" - 1"	1/4" - 1"	1/4" - 1"	1/16" - 1"	7 - 29
	Tolerance		ISO 228		ISO 228	ISO 228			2B	2B	2B	2B	-	-
	DIN	5156	5156	5156	5156	5156	5156	5156	371/376	371/376	Factory standard	Factory standard	WN	40430
	Chamfer (form)	B	C	C	C	C	C	C	B	C	B	C	C	B
	Possible thread depth	2.5xD	1.5xD	2xD	3xD	3xD	2xD	2xD	3xD	2.5xD	2xD	2xD	1.5xD	3xD
	Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
	Coating/surface treatment	Vapour-treated	Blank	Vapour-treated	Blank	Vapour-treated	TiCN	Vapour-treated	Vapour-treated	Vapour-treated	Vapour-treated	Vapour-treated	Blank	Blank
	Type	S-POT		Universal			A-SFT	S-SFT	UNI	UNI	UNI	UNI		
Info														
Item number	133987....	135300....	134770....	135315....	135320....	133860....	133986....	134795....	134790....	134796....	134791....	135345....	135380....	
Page	285	282	281	282	283	284	285	286	286	287	287	288	288	

# ATORN® Universal machine taps



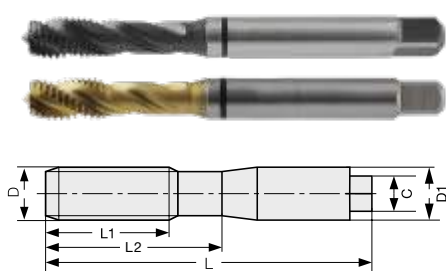
- ISO 6H metric thread
- Type C, 2 to 3-thread chamfer, for blind-hole threads
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated; HSS-E, TiN-coated**
- Possible thread depth 2.5 x D
- **for universal applications**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	ENP/LEP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
134710....	●	●	●		○	○			○			○		○					
134715....	●	●	●		●	●			○			○		○					
134710....	●	●	●		○	○			○			○		○					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.


D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	Vapour-treated art.no.	€	TiN art.no.	€
M 1	0.25	40	5	-	2.5	2.1	0.75	134710 0010	32,50		
M 1.2	0.25	40	5	-	2.5	2.1	0.95	134710 0012	32,50		
M 1.4	0.3	40	7	-	2.5	2.1	1.10	134710 0014	28,90		
M 1.6	0.35	40	8	-	2.5	2.1	1.25	134710 0016	27,40		
M 1.7	0.35	40	8	-	2.5	2.1	1.35	134710 0017	28,50		
M 1.8	0.35	40	8	-	2.5	2.1	1.45	134710 0018	27,40		
M 2	0.4	45	8	-	2.8	2.1	1.60	134710 0020	23,50		
M 2.2	0.45	45	9	-	2.8	2.1	1.75	134710 0022	23,90		
M 2.3	0.4	45	9	-	2.8	2.1	1.90	134710 0023	26,90		
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134710 0025	23,50		
M 2.6	0.45	50	9	-	2.8	2.1	2.15	134710 0026	24,50		
M 3	0.5	56	10	18	3.5	2.7	2.50	134710 0030	11,20	134715 0030	17,40
M 4	0.7	63	12	21	4.5	3.4	3.30	134710 0040	11,20	134715 0040	17,40
M 5	0.8	70	14	25	6	4.9	4.20	134710 0050	11,55	134715 0050	17,80
M 6	1.0	80	16	30	6	4.9	5.00	134710 0060	11,55	134715 0060	18,15
M 8	1.25	90	18	35	8	6.2	6.80	134710 0080	14,65	134715 0080	21,80
M 10	1.5	100	20	39	10	8	8.50	134710 0100	17,30	134715 0100	25,50
M 12	1.75	110	22	-	9	7	10.25	134710 0120	25,20	134715 0120	35,-
M 16	2.0	110	28	-	12	9	14.00	134710 0160	36,90	134715 0160	52,40
M 20	2.5	140	32	-	16	12	17.50	134710 0200	60,10	134715 0200	85,-
M 24	3.0	160	30	-	18	14.5	21.00	134710 0240	99,20		
M 27	3.0	160	30	-	20	16	24.00	134710 0270	162,-		
M 30	3.5	180	35	-	22	18	26.60	134710 0300	192,50		



Set	Contents	Vapour-treated art.no.	€
	7-pcs. set: M3, M4, M5, M6, M8, M10, M12	134710 1000	143,-



# ATORN® Universal machine taps

M
60°
HSS-E
DIN 371
DIN 376
ISO 2 6H
B 3,5-5

3xD
TiN
Vap.
i Vc/tz
407

- Straight-fluted with spiral point
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated; HSS-E, TiN-coated**
- The spiral point ensures strong chip removal to the front
- Possible thread depth 3 x D
- **for universal applications**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
134700....	●	●	●		○	○			○			○		○				
134705....	●	●			●	●			○			○		○				
134700....	●	●			○	○			○			○		○				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	Vapour-treated art.no.	€	TiN art.no.	€
M 1	0.25	40	5	-	2.5	2.1	0.75	134700 0010	31,90		
M 1.2	0.25	40	5	-	2.5	2.1	0.95	134700 0012	31,90		
M 1.4	0.30	40	7	-	2.5	2.1	1.10	134700 0014	28,40		
M 1.6	0.35	40	8	-	2.5	2.1	1.25	134700 0016	27,-		
M1.7	0.35	40	8	-	2.5	2.1	1.35	134700 0017	28,-		
M 1.8	0.35	40	8	-	2.5	2.1	1.45	134700 0018	27,-		
M 2	0.40	45	8	-	2.8	2.1	1.60	134700 0020	23,-		
M 2.2	0.45	45	9	-	2.8	2.1	1.75	134700 0022	23,40		
M 2.3	0.40	45	9	-	2.8	2.1	1.90	134700 0023	26,40		
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134700 0025	23,-		
M 2.6	0.45	50	9	-	2.8	2.1	2.15	134700 0026	24,20		
M 3	0.5	56	10	18	3.5	2.7	2.50	134700 0030	11,20	134705 0030	17,40
M 4	0.7	63	12	21	4.5	3.4	3.30	134700 0040	11,20	134705 0040	17,40
M 5	0.8	70	14	25	6	4.9	4.20	134700 0050	11,55	134705 0050	17,80
M 6	1.0	80	16	30	6	4.9	5.00	134700 0060	11,55	134705 0060	18,15
M 8	1.25	90	18	35	8	6.2	6.80	134700 0080	14,65	134705 0080	21,80
M 10	1.5	100	20	39	10	8	8.50	134700 0100	17,30	134705 0100	25,50
M 12	1.75	110	22	-	9	7	10.25	134700 0120	25,20	134705 0120	35,-
M 16	2.0	110	28	-	12	9	14.00	134700 0160	36,20	134705 0160	52,40
M 20	2.5	140	32	-	16	12	17.50	134700 0200	59,-	134705 0200	85,-
M 24	3.0	160	36	-	18	14.5	21.00	134700 0240	97,70		
M 27	3.0	160	36	-	20	16	24.00	134700 0270	160,-		
M 30	3.5	180	40	-	22	18	26.50	134700 0300	188,50		

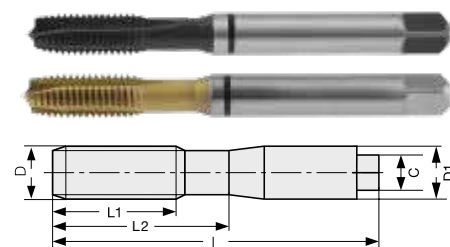
1127

1127

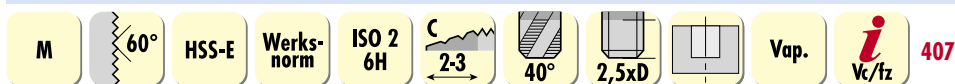
**Set**

Contents	Vapour-treated art.no.	€
7-pcs. set: M3, M4, M5, M6, M8, M10, M12	134700 1000	143,-

1127



## ATORN® Universal machine taps, long



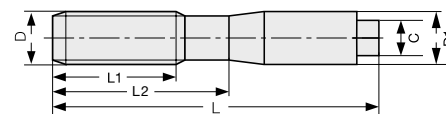
- **Metric ISO 6H thread**
- Form C, 2-3 thread chamfer, for blind-hole threads
- Constructional dimensions similar to DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated**
- Possible thread depth 2.5 x D
- **For universal applications**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		5-15	5-15		4-6	4-6			5-8			10-15		10-15					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

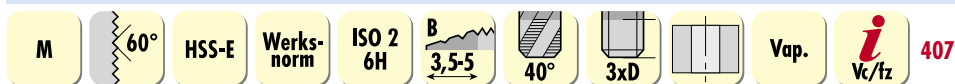


D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	112	6	18	3.5	2.7	2.5	134780 0030	27,70
M 4	0.7	126	7	21	4.5	3.4	3.3	134780 0040	27,70
M 5	0.8	140	8	25	6	4.9	4.2	134780 0050	27,70
M 6	1	160	10	30	6	4.9	5	134780 0060	27,70
M 8	1.25	180	13	35	8	6.2	6.8	134780 0080	36,40
M 10	1.5	200	15	39	10	8	8.5	134780 0100	54,50
M 12	1.75	220	18	-	9	7	10.25	134780 0120	72,30
M 14	2	220	20	-	11	9	12	134780 0140	86,-
M 16	2	220	20	-	12	9	14	134780 0160	87,50



1127

## ATORN® Universal machine taps, long



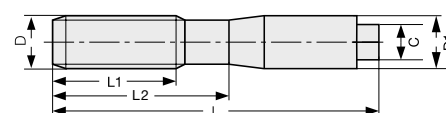
- Straight-fluted with spiral point
- Constructional dimensions similar to DIN 371 = up to M 10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated**
- The spiral point ensures strong chip removal to the front
- Possible thread depth 3 x D
- **For universal applications**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		5-15	5-15		4-6	4-6			5-8			10-15		10-15					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	112	10	18	3.5	2.7	2.5	134785 0030	27,70
M 4	0.7	126	12	21	4.5	3.4	3.3	134785 0040	27,70
M 5	0.8	140	14	25	6	4.9	4.2	134785 0050	27,70
M 6	1	160	16	30	6	4.9	5	134785 0060	27,70
M 8	1.25	180	18	35	8	6.2	6.8	134785 0080	36,40
M 10	1.5	200	20	39	10	8	8.5	134785 0100	54,50
M 12	1.75	220	22	-	9	7	10.25	134785 0120	72,30
M 14	2	220	25	-	11	9	12	134785 0140	86,-
M 16	2	220	28	-	12	9	14	134785 0160	87,50



1127

## ATORN® Universal machine tap sets

M
60°
HSS-E
DIN 371/376
ISO 2 6H
2,5xD
Vap.
Vc/fz
407

- **Metric ISO 6H thread**
- Constructional dimensions similar to DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated**
- Possible thread depth 2.5 x D
- **For universal applications**



14-pcs.



70-pcs.

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●		○	○			○				○		○					
		5-15	5-15		4-6	4-6			5-8				10-15		10-15					

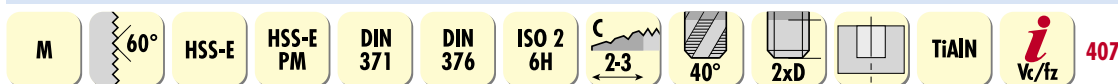
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Contents		
	art.no.	€
14-pcs. set: M3-M12 through-hole and blind-hole thread (1 of each)	134712 1014	214,-
70-pcs. set: M3-M12 through-hole and blind-hole thread (5 of each)	134712 1070	939,-

1127



## ATORN® Universal machine tap ULTRA-HL



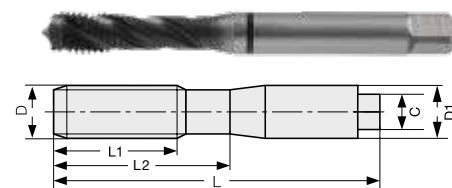
- **ISO 6H metric thread**
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material HSS-E, HSS-E-PM, Hardlube coating**
- Easy chip removal to the rear
- Possible thread depth 2xD
- **BALINIT® HARDLUBE:** The high level of hardness and temperature resistance of the TiAlN layer effectively protects cutting edges from wear, while the excellent sliding and lubricating properties of the WC/C ensure smooth chip flow. The result: Greater production reliability thanks to reliable, reproducible performance.



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
134750....	●	●	●		●	●			○				●	○					
		10-20	5-20		5-8	5-8			10-15				10-20	10-20					
134740....	●	●			●	●			○				●	○					
		15-35	10-25		5-15	5-15			10-20				10-30	10-25					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	HSS-E		HSS-E-PM	
								art.no.	€	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.5	134750 0030	20,50	134740 0030	25,70
M 4	0.7	63	12	21	4.5	3.4	3.3	134750 0040	20,50	134740 0040	25,70
M 5	0.8	70	14	25	6	4.9	4.2	134750 0050	21,50	134740 0050	26,60
M 6	1	80	16	30	6	4.9	5	134750 0060	21,70	134740 0060	27,10
M 8	1.25	90	18	35	8	6.2	6.8	134750 0080	26,50	134740 0080	32,10
M 10	1.5	100	20	39	10	8	8.5	134750 0100	31,-	134740 0100	35,70
M 12	1.75	110	22	-	9	7	10.25	134750 0120	39,30	134740 0120	46,20
M 16	2	110	28	-	12	9	14	134750 0160	58,-	134740 0160	65,60
M 20	2.5	140	32	-	16	12	17.5	134750 0200	89,-	134740 0200	100,50
								1127		1127	



## ATORN® Universal machine tap ULTRA-HL



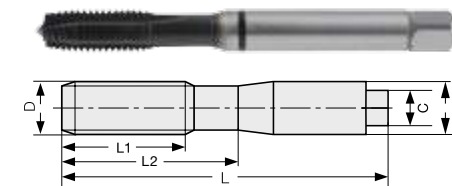
- **ISO 6H metric thread**
- Straight-fluted with spiral point
- Type B, 3.5-5 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material HSS-E, HSS-E-PM, Hardlube coating**
- For through-hole threads
- Possible thread depth 3 x D
- **BALINIT® HARDLUBE:** The high level of hardness and temperature resistance of the TiAlN layer effectively protects cutting edges from wear, while the excellent sliding and lubricating properties of the WC/C ensure smooth chip flow. The result: Greater production reliability thanks to reliable, reproducible performance.



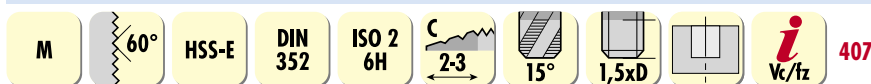
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
134755....	●	●	●		●	●			○				●	○					
		10-20	5-20		5-8	5-8			10-15				10-20	10-20					
134745....	●	●			●	●			○				●	○					
		15-35	10-25		5-15	5-15			10-20				10-30	10-25					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	HSS-E		HSS-E-PM	
								art.no.	€	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.5	134755 0030	20,50	134745 0030	25,70
M 4	0.7	63	12	21	4.5	3.4	3.3	134755 0040	20,50	134745 0040	25,70
M 5	0.8	70	14	25	6	4.9	4.2	134755 0050	21,50	134745 0050	26,60
M 6	1	80	16	30	6	4.9	5	134755 0060	21,70	134745 0060	27,10
M 8	1.25	90	18	35	8	6.2	6.8	134755 0080	26,50	134745 0080	32,10
M 10	1.5	100	20	39	10	8	8.5	134755 0100	31,-	134745 0100	35,70
M 12	1.75	110	22	-	9	7	10.25	134755 0120	39,30	134745 0120	46,20
M 16	2	110	28	-	12	9	14	134755 0160	58,-	134745 0160	65,60
M 20	2.5	140	32	-	16	12	17.5	134755 0200	89,-	134745 0200	100,50
								1127		1127	



## ATORN® Machine tap



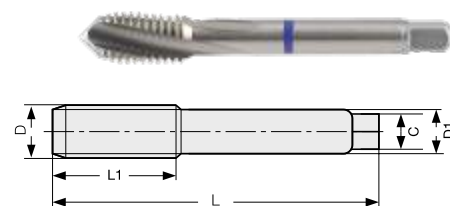
- **Metric ISO 6H thread**
- Form C, 2-3 thread chamfer, for blind-hole threads
- DIN 352
- **Cutting material: HSS-E**
- Possible thread depth 1.5 x D

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		5-20	5-15																

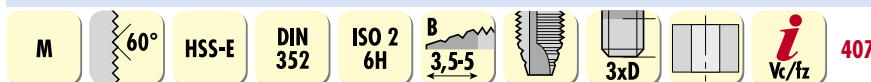
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	40	6	3.5	2.7	2.50	<b>135395 0030</b>	<b>10,50</b>
M 4	0.7	45	7.5	3.4	3.4	3.30	135395 0040	<b>10,70</b>
M 5	0.8	50	8.5	4.9	4.9	4.20	135395 0050	<b>11,-</b>
M 6	1.0	56	11	4.9	4.9	5.00	135395 0060	<b>11,15</b>
M 8	1.25	63	14	4.9	4.9	6.80	135395 0080	<b>12,95</b>
M 10	1.5	70	16	5.5	5.5	8.50	135395 0100	<b>16,70</b>
M 12	1.75	75	18.5	7.0	7.0	10.25	135395 0120	<b>21,80</b>
M 16	2.0	80	20	9.0	9.0	14.00	135395 0160	<b>37,20</b>
M 20	2.5	95	25	16.0	12.0	17.50	135395 0200	<b>62,10</b>

1127



## ATORN® Machine tap



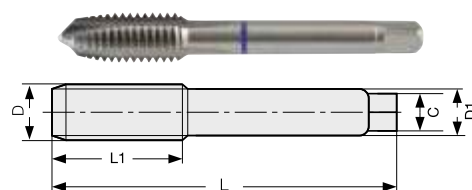
- **ISO 6H metric thread**
- **Straight-fluted with spiral point, type B, 3.5 to 5-thread chamfer**
- DIN 352
- **Cutting material: HSS-E**
- For through-hole threads
- The spiral point ensures chip removal to the front
- Possible thread depth 3 x D

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		5-20	5-15																

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	36	8	2.8	2.1	1.60	<b>135360 0020</b>	<b>17,40</b>
M 2.5	0.45	40	9	2.8	2.1	2.05	135360 0025	<b>17,40</b>
M 3	0.5	40	10	3.5	2.7	2.50	135360 0030	<b>11,05</b>
M 4	0.7	45	12	4.5	3.4	3.30	135360 0040	<b>10,85</b>
M 5	0.8	50	14	6.0	4.9	4.20	135360 0050	<b>10,85</b>
M 6	1.0	56	14	6.0	4.9	5.00	135360 0060	<b>10,85</b>
M 8	1.25	63	18	6.0	4.9	6.80	135360 0080	<b>13,50</b>
M 10	1.5	70	20	7.0	5.5	8.50	135360 0100	<b>17,80</b>
M 12	1.75	75	24	9.0	7.0	10.25	135360 0120	<b>23,30</b>
M 16	2.0	80	26	12.0	9.0	14.00	135360 0160	<b>39,-</b>

1127



# ATORN® SARA® Machine tap

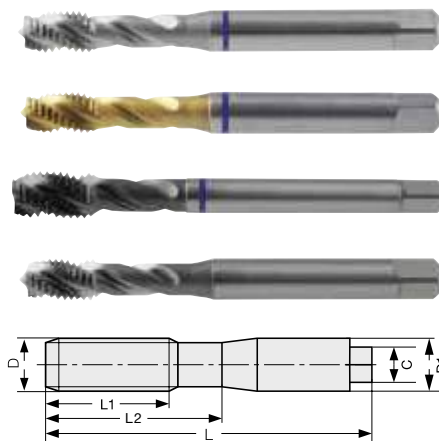
M
60°
HSS-E
DIN 371
DIN 376
ISO 2 6H
C 2-3
40°
2,5xD
TiN
TiCN
i Vc/tz
407

- ISO 6H metric thread
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E; HSS-E TiN; HSS-E TiCN**
- For blind-hole threads
- Strong chip removal to the rear for long-chipping materials
- Minimal thread relief grinding
- Possible thread depth 2.5 x D

**Up to 1000 N/mm<sup>2</sup>**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
134200....	●	5-20	5-15		○	○			○											
134205....	●	5-40	5-30		○	○			○											
134210....	●	5-40	5-30		○	○			○											
134201....	●	5-20	5-15		○	○			○											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	ATORN®		ATORN®		ATORN®		SARA®	
								art.no.	€	TiN art.no.	€	TiCN art.no.	€	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	134200 0020	17,70	134205 0020	25,30	134210 0020	25,30		
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134200 0025	17,70	134205 0025	25,30	134210 0025	25,30		
M 3	0.5	56	6	18	3.5	2.7	2.50	134200 0030	14,10	134205 0030	22,30	134210 0030	22,30	134201 0030	9,90
M 4	0.7	63	7	21	4.5	3.4	3.30	134200 0040	14,10	134205 0040	22,30	134210 0040	22,30	134201 0040	9,90
M 5	0.8	70	8	25	6	4.9	4.20	134200 0050	14,20	134205 0050	22,40	134210 0050	22,40	134201 0050	10,-
M 6	1	80	10	30	6	4.9	5.00	134200 0060	14,45	134205 0060	23,30	134210 0060	23,30	134201 0060	10,15
M 8	1.25	90	13	35	8	6.2	6.80	134200 0080	18,05	134205 0080	27,50	134210 0080	27,50	134201 0080	12,65
M 10	1.5	100	15	39	10	8	8.50	134200 0100	21,40	134205 0100	31,90	134210 0100	31,90	134201 0100	14,95
M 12	1.75	110	18	-	9	7	10.25	134200 0120	30,60	134205 0120	44,10	134210 0120	44,10	134201 0120	21,40
M 14	2	110	20	-	11	9	12.00	134200 0140	43,60			134210 0140	61,10		
M 16	2	110	20	-	12	9	14.00	134200 0160	45,90	134205 0160	65,10	134210 0160	65,10		
M 20	2.5	140	25	-	16	12	17.50	134200 0200	75,30	134205 0200	107,-	134210 0200	107,-		
M 24	3	160	30	-	18	14.5	21.00	134200 0240	109,-	134205 0240	146,50				
M 30	3.5	180	35	-	22	18	26.50	134200 0300	209,-	134205 0300	255,-				

**ATORN® SARA® Machine tap**

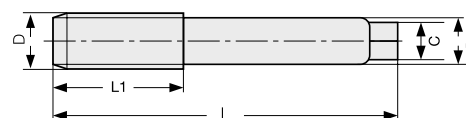


- **ISO 6H metric thread**
- Straight-fluted with spiral point, type B, 3.5 to 5-thread chamfer
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, HSS-E TiN, HSS-E TiCN**
- For through-hole threads
- The spiral point ensures strong chip removal to the front
- Possible thread depth 3 x D

**Up to 1000 N/mm<sup>2</sup>**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
134105....	●	5-20	5-15		○	○			○											
134110....	●	5-40	5-30		○	○			○											
134115....	●	5-40	5-30		○	○			○											
134106....	●	5-20	5-15		○	○			○											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	ATORN®		ATORN®		ATORN®		SARA®	
								art.no.	€	TiN art.no.	€	TiCN art.no.	€	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	134105 0020	17,40						
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134105 0025	14,35						
M 3	0.5	56	10	18	3.5	2.7	2.50	134105 0030	11,55	134110 0030	20,40	134115 0030	20,40	134106 0030	9,30
M 3.5	0.6	56	11	20	4	3	2.90	134105 0035	13,45	134110 0035	22,50	134115 0035	22,50		
M 4	0.7	63	12	21	4.5	3.4	3.30	134105 0040	11,55	134110 0040	20,40	134115 0040	20,40	134106 0040	9,30
M 5	0.8	70	14	25	6	4.9	4.20	134105 0050	11,65	134110 0050	20,50	134115 0050	20,50	134106 0050	9,40
M 6	1.0	80	16	30	6	4.9	5.00	134105 0060	12,10	134110 0060	21,80	134115 0060	21,80	134106 0060	9,70
M 7	1.0	80	16	30	7	5.5	6.00	134105 0070	17,90						
M 8	1.25	90	18	35	8	6.2	6.80	134105 0080	13,70	134110 0080	24,50	134115 0080	24,50	134106 0080	10,95
M 10	1.5	100	20	39	10	8	8.50	134105 0100	16,80	134110 0100	29,70	134115 0100	29,70	134106 0100	13,45
M 12	1.75	110	22	-	9	7	10.25	134105 0120	23,70	134110 0120	40,30	134115 0120	40,30	134106 0120	18,95
M 14	2.0	110	25	-	11	9	12.00	134105 0140	32,20	134110 0140	56,50	134115 0140	56,50		
M 16	2.0	110	28	-	12	9	14.00	134105 0160	36,50	134110 0160	60,10	134115 0160	60,10		
M 18	2.5	125	32	-	14	11	15.50	134105 0180	50,90	134110 0180	89,-	134115 0180	89,-		
M 20	2.5	140	32	-	16	12	17.50	134105 0200	56,50	134110 0200	97,20	134115 0200	97,20		
M 22	2.5	140	32	-	18	14.5	19.50	134105 0220	83,40						
M 24	3.0	160	36	-	18	14.5	21.00	134105 0240	83,40	134110 0240	132,50	134115 0240	132,50		
M 27	3.0	160	36	-	20	16	24.00	134105 0270	155,-						
M 30	3.5	180	40	-	22	18	26.50	134105 0300	164,-						

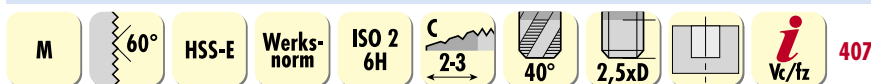
1127

1127

1127

1156

## ATORN® Machine tap, long



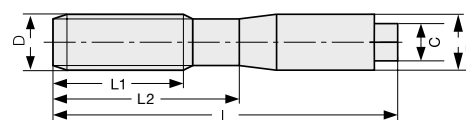
- **ISO 6H metric thread**
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- Constructional dimensions similar to DIN 371 = up to M10, similar to DIN 376 = from M12
- **Cutting material: HSS-E**
- For blind-hole threads
- Strong chip removal to the rear for long-chipping materials
- Minimal thread relief grinding
- Possible thread depth 2.5 x D

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	< 55 HRc	< 60 HRc	≥ 60 HRc		
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

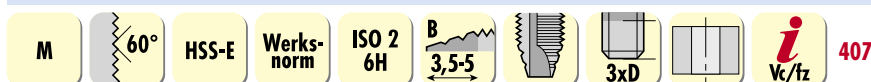


D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	112	6	18	3.5	2.7	2.50	134220 0030	39,10
M 4	0.7	126	7	21	4.5	3.4	3.30	134220 0040	39,10
M 5	0.8	140	8	25	6	4.9	4.20	134220 0050	37,70
M 6	1	160	10	30	6	4.9	5.00	134220 0060	37,70
M 8	1.25	180	13	35	8	6.2	6.80	134220 0080	46,60
M 10	1.5	200	15	39	10	8	8.50	134220 0100	52,40
M 12	1.75	220	18	-	9	7	10.25	134220 0120	64,10
M 14	2	220	20	-	9	7	12.00	134220 0140	100,50
M 16	2	220	20	-	12	9	14.00	134220 0160	111,-
M 20	2.5	280	25	-	16	12	17.50	134220 0200	151,-



1127

## ATORN® Machine tap, long



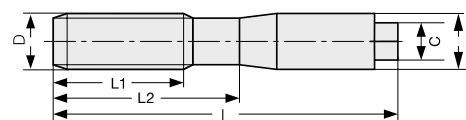
- **ISO 6H metric thread**
- Straight-fluted with spiral point, type B, 3.5 to 5-thread chamfer
- Constructional dimensions similar to DIN 371 = up to M 10, similar to DIN 376 = from M12
- **Cutting material: HSS-E**
- For through-hole threads
- The spiral point ensures strong chip removal to the front
- Possible thread depth 3 x D

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	< 55 HRc	< 60 HRc	≥ 60 HRc		
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	112	10	18	3.5	2.7	2.50	134125 0030	38,50
M 4	0.7	126	12	21	4.5	3.4	3.30	134125 0040	38,50
M 5	0.8	140	14	25	6	4.9	4.20	134125 0050	37,20
M 6	1.0	160	16	30	6	4.9	5.00	134125 0060	37,20
M 8	1.25	180	18	35	8	6.2	6.80	134125 0080	45,90
M 10	1.5	200	20	39	10	8	8.50	134125 0100	51,40
M 12	1.75	220	22	-	9	7	10.25	134125 0120	63,10
M 14	2.0	220	25	-	11	9.0	12.00	134125 0140	76,30
M 16	2.0	220	28	-	12	9.0	14.00	134125 0160	86,50
M 20	2.5	280	32	-	16	12.0	17.50	134125 0200	126,50



1127

## ATORN® Left-hand thread machine tap

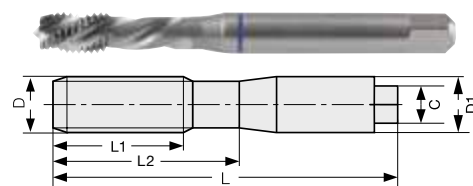


- **ISO 6H metric left-hand thread**
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E**
- For blind-hole threads
- Strong chip removal to the rear for long-chipping materials
- Minimal thread relief grinding
- Possible thread depth 2.5 x D

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		●	●		○	○			○										
		5-20	5-15		5-10	5-12			8-20										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3-LH	0.5	56	6	18	3.5	2.7	2.50	134215 0030	40,80
M 4-LH	0.7	63	7	21	4.5	3.4	3.30	134215 0040	40,80
M 5-LH	0.8	70	8	25	6	4.9	4.20	134215 0050	40,30
M 6-LH	1	80	10	30	6	4.9	5.00	134215 0060	39,10
M 8-LH	1.25	90	13	35	8	6.2	6.80	134215 0080	48,30
M 10-LH	1.5	100	15	39	10	8	8.50	134215 0100	54,50
M 12-LH	1.75	110	18	-	9	7	10.25	134215 0120	67,20
M 16-LH	2	110	20	-	12	9	14.00	134215 0160	115,-
M 20-LH	2.5	140	25	-	16	12	17.50	134215 0200	156,-



1127

## ATORN® Left-hand thread machine tap

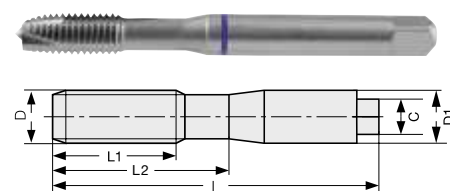


- **ISO 6H metric left-hand thread**
- Straight-fluted with spiral point, type B, 3.5 to 5-thread chamfer
- Constructional dimensions DIN 371 = up to M 10, DIN 376 = from M12
- **Cutting material: HSS-E**
- For through-hole threads
- The spiral point ensures strong chip removal to the front
- Possible thread depth 3 x D

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		●	●		○	○			○										
		5-20	5-15		5-10	5-12			8-20										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 4-LH	0.7	63	12	21	4.5	3.4	3.30	134120 0040	40,30
M 5-LH	0.8	70	14	25	6	4.9	4.20	134120 0050	38,50
M 6-LH	1.0	80	16	30	6	4.9	5.00	134120 0060	38,50
M 8-LH	1.25	90	18	35	8	6.2	6.80	134120 0080	47,60
M 10-LH	1.5	100	20	39	10	8	8.50	134120 0100	53,40
M 12-LH	1.75	110	22	-	9	7	10.25	134120 0120	65,60
M 14-LH	2.0	110	25	-	11	9	12.00	134120 0140	93,60
M 16-LH	2.0	110	28	-	12	9	14.00	134120 0160	104,-
M 20-LH	2.5	140	32	-	16	12	17.50	134120 0200	154,-



1127

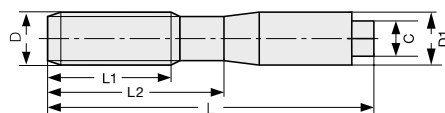


## ATORN® Machine tap, weak-spiralled

M 60° HSS-E DIN 371 ISO 2 6H C 2-3 15° 2,5xD Vc/tz 407

Up to 1000 N/mm<sup>2</sup>

- ISO 6H metric thread
- Type C, 2 to 3-thread chamfer, for blind-hole threads
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E**
- Possible thread depth 2.5 x D



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



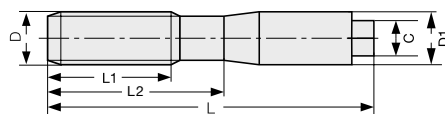
D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	134175 0020	24,10
M 2.3	0.4	45	9	-	2.8	2.1	1.90	134175 0023	24,10
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134175 0025	23,-
M 2.6	0.45	50	9	-	2.8	2.1	2.10	134175 0026	24,10
M 3	0.5	56	10	18	3.5	2.7	2.50	134175 0030	16,80
M 3.5	0.6	56	11	20	4	3	2.90	134175 0035	23,-
M 4	0.7	63	12	21	4.5	3.4	3.30	134175 0040	16,80
M 5	0.8	70	14	25	6	4.9	4.20	134175 0050	17,60
M 6	1.0	80	16	30	6	4.9	5.00	134175 0060	17,60
M 7	1.0	80	16	30	7	5.5	6.00	134175 0070	23,60
M 8	1.25	90	18	35	8	6.2	6.80	134175 0080	22,80
M 10	1.5	100	20	39	10	8	8.50	134175 0100	26,10
M 12	1.75	110	22	-	9	7	10.25	134175 0120	33,40
M 14	2.0	110	25	-	11	9	12.00	134175 0140	39,70
M 16	2.0	110	28	-	12	9	14.00	134175 0160	48,-
M 18	2.5	125	32	-	14	11	15.50	134175 0180	60,10
M 20	2.5	140	32	-	16	12	17.50	134175 0200	60,10
M 24	3.0	160	36	-	18	14.5	21.00	134175 0240	108,-
M 30	3.5	180	40	-	22	18	26.50	134175 0300	234,-

1127

## ATORN® Machine tap

M 60° HSS-E PM DIN 371 ISO 2 6H C 2-3 40° 2,5xD Vc/tz 407

- ISO 6H metric thread
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM**
- For blind-hole threads
- Shortened threaded part, larger relief grinding, narrow cutting inserts
- Possible thread depth 2.5 x D



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 5-20	● 5-15	● 5-10	○ 5-10	○ 5-12	○ 5-8	● 8-20	● 8-20	○ 2-6	○ 2-6		● 20-40	○ 10-25	● 10-12					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



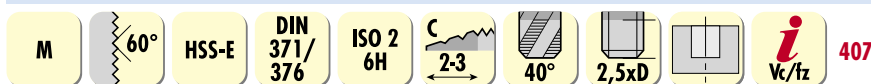
D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	134235 0030	32,-
M 4	0.7	63	12	21	4.5	3.4	3.30	134235 0040	32,-
M 5	0.8	70	14	25	6	4.9	4.20	134235 0050	30,50
M 6	1.0	80	16	30	6	4.9	5.00	134235 0060	30,50
M 8	1.25	90	18	35	8	6.2	6.80	134235 0080	37,60

1127

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 10	1.5	100	20	39	10	8	8.50	134235 0100	42,60
M 12	1.75	110	22	-	9	7	10.25	134235 0120	51,90
M 14	2.0	110	25	-	11	9	12.00	134235 0140	73,30
M 16	2.0	110	28	-	12	9	14.00	134235 0160	80,90
M 20	2.5	140	32	-	16	12	17.50	134235 0200	116,-

1127

## ATORN® Machine tap set



- In a plastic case
- **HSS-E tap for ISO 6H metric thread**
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- For blind-hole threads
- Strong chip removal to the rear for long-chipping materials
- Minimal thread relief grinding
- Possible thread depth 2.5 x D
- **HSS-E twist drill bit, type TLP**
- 130° point angle



**Including tapping hole drill bit**

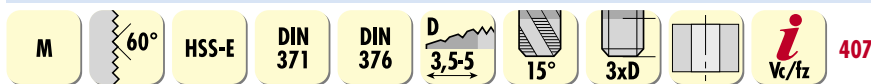
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●		●	●			○											
		5-20	5-15		5-10	5-12			8-20											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Contents		art.no.	€
Tap No. 134200.... M3, M4, M5, M6, M8, M10, M12		<b>139001</b> 0001	<b>188,-</b>
Twist drill bit No. 101013.... Ø 2.5 3.3 4.2 5.0 6.8 8.5 10.2 mm			

1127

## ATORN® Machine tap, left-helix



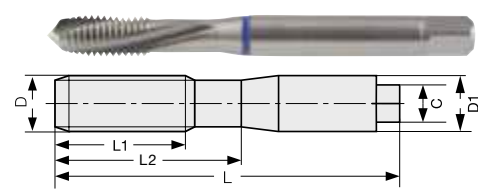
- **ISO 6H metric thread**
- Type D, 3.5 to 5-thread chamfer
- 15° left-hand twist
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E**
- For through-hole threads
- Possible thread depth 3 x D

**15° left-hand twist for right-hand through-hole thread**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	○		●	●			○											
		5-20	5-15		5-10	5-12			8-20											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	<b>135365</b> 0030	<b>16,30</b>
M 4	0.7	63	12	21	4.5	3.4	3.30	135365 0040	<b>16,30</b>
M 5	0.8	70	14	25	6	4.9	4.20	135365 0050	<b>16,70</b>
M 6	1.0	80	16	30	6	4.9	5.00	135365 0060	<b>16,70</b>
M 8	1.25	90	18	35	8	6.2	6.80	135365 0080	<b>20,10</b>
M 10	1.5	100	20	39	10	8.0	8.50	135365 0100	<b>23,50</b>
M 12	1.75	110	24	-	9	7.0	10.25	135365 0120	<b>29,20</b>
M 14	2.0	110	26	-	11	9.0	12.00	135365 0140	<b>40,50</b>
M 16	2.0	110	26	-	12	9.0	14.00	135365 0160	<b>46,30</b>
M 20	2.5	140	32	-	16	12.0	17.50	135365 0200	<b>76,30</b>



1127

## ATORN® Machine tap, without spiral point

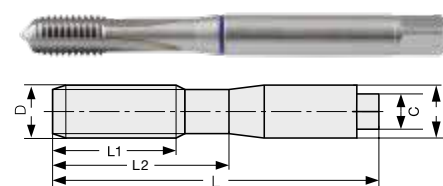


- **ISO 6H metric thread**
- Straight-fluted
- Type C, 2-3 thread chamfer
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E**
- For blind-hole and through-hole threads
- Possible thread depth 1.5xD

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 5-20	● 5-15		● 5-10	● 5-12			○ 8-20											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	4.5	-	2.8	2.1	1.60	135150 0020	21,20
M 2.5	0.45	50	5.0	-	2.8	2.1	2.05	135150 0025	20,60
M 3	0.5	56	6.0	18	3.5	2.7	2.50	135150 0030	17,10
M 4	0.7	63	7.5	21	4.5	3.4	3.30	135150 0040	16,20
M 5	0.8	70	8.5	25	6	4.9	4.20	135150 0050	17,50
M 6	1.0	80	11	30	6	4.9	5.00	135150 0060	17,70
M 8	1.25	90	14	35	8	6.2	6.80	135150 0080	19,65
M 10	1.5	100	16	39	10	8	8.50	135150 0100	24,10
M 12	1.75	110	18.5	-	9	7	10.25	135150 0120	28,50
M 14	2.0	110	20	-	11	9	12.00	135150 0140	54,-
M 16	2.0	110	20	-	12	9	14.00	135150 0160	49,50
M 20	2.5	140	25	-	16	12	17.50	135150 0200	90,60



1127

## ATORN® Machine nut tap



- **Extra-long, ISO 6H metric thread**
- Straight-fluted with extra-long shank
- Approx. 20-thread chamfer
- **Cutting material: HSS-E**
- For through-hole threads
- Possible thread depth 3 x D

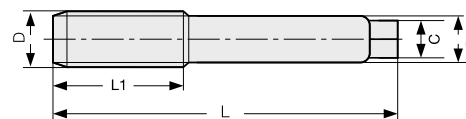
Long chamfer

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 5-20	● 5-15		● 5-10	● 5-12			○ 8-20											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

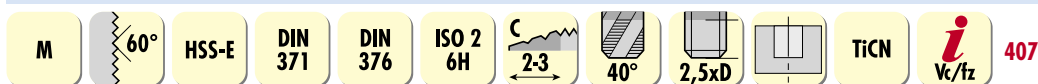


D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	70	22	2.2	-	2.50	135100 0030	39,10
M 4	0.7	90	25	2.8	2.1	3.30	135100 0040	34,60
M 5	0.8	100	28	3.5	2.7	4.20	135100 0050	37,30
M 6	1.0	110	32	4.5	3.4	5.00	135100 0060	42,80
M 8	1.25	125	40	6	4.9	6.80	135100 0080	53,40
M 10	1.5	140	45	7	5.5	8.50	135100 0100	64,10
M 12	1.75	180	50	9	7	10.25	135100 0120	86,50
M 16	2	200	63	12	9	14.00	135100 0160	119,-
M 20	2.5	250	70	16	12	17.50	135100 0200	234,-



1127

### ATORN® SARA® Machine tap



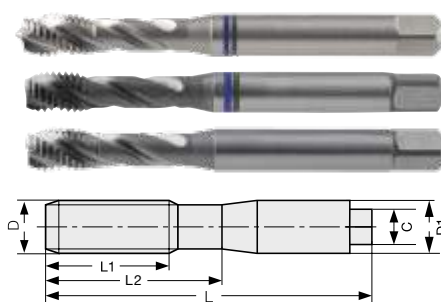
- ISO 6H metric thread
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, HSS-E, TiCN-coated**
- For blind-hole threads
- Possible thread depth 2.5 x D

Up to 1400 N/mm<sup>2</sup>

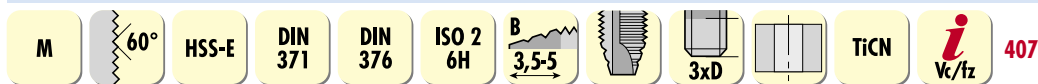
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
134230....	●	●	●	●	○			●	●	○	○		○							
134233....	●	●	●	●	○			●	●	○	○		○							
134231....	●	●	○	○	○			●	●	○	○		○							

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	ATORN®			SARA®		
								art.no.	€	TiCN art.no.	€	art.no.	€
M 3	0.5	56	6	18	3.5	2.7	2.50	134230 0030	15,25	134233 0030	20,10	134231 0030	10,70
M 4	0.7	63	7	21	4.5	3.4	3.30	134230 0040	15,25	134233 0040	20,10	134231 0040	10,70
M 5	0.8	70	8	25	6	4.9	4.20	134230 0050	15,50	134233 0050	20,20	134231 0050	10,85
M 6	1.0	80	10	30	6	4.9	5.00	134230 0060	15,80	134233 0060	21,10	134231 0060	11,10
M 8	1.25	90	13	35	8	6.2	6.80	134230 0080	19,45	134233 0080	24,80	134231 0080	13,65
M 10	1.5	100	15	39	10	8	8.50	134230 0100	23,20	134233 0100	28,90	134231 0100	16,20
M 12	1.75	110	18	-	9	7	10.25	134230 0120	33,50	134233 0120	40,40	134231 0120	23,40
M 16	2.0	110	20	-	12	9	14.00	134230 0160	50,90	134233 0160	60,60		
M 20	2.5	140	25	-	16	12	17.50	134230 0200	87,50	134233 0200	113,-		
								1127		1127		1156	



### ATORN® SARA® Machine tap



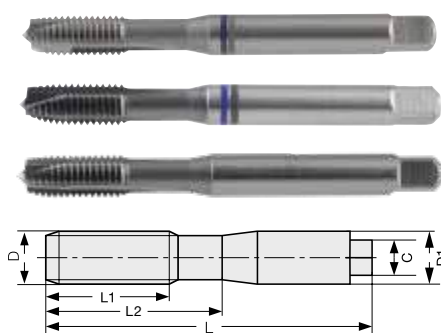
- ISO 6H metric thread
- Straight-fluted
- With spiral point, type B, 3.5 to 5-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, HSS-E, TiCN-coated**
- For through-hole threads
- Possible thread depth 3 x D

Up to 1400 N/mm<sup>2</sup>

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
134135....	●	●	●	●	○			●	●	○	○		○						
134137....	●	●	●	●	○			●	●	○	○		○						
134136....	●	●	○	○	○			●	●	○	○		○						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	ATORN®			SARA®		
								art.no.	€	TiCN art.no.	€	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	134135 0030	16,10	134137 0030	22,70	134136 0030	11,30
M 4	0.7	63	12	21	4.5	3.4	3.30	134135 0040	16,10	134137 0040	22,70	134136 0040	11,30
M 5	0.8	70	14	25	6	4.9	4.20	134135 0050	16,20	134137 0050	22,90	134136 0050	11,35
M 6	1.0	80	16	30	6	4.9	5.00	134135 0060	16,70	134137 0060	23,70	134136 0060	11,70
M 8	1.25	90	18	35	8	6.2	6.80	134135 0080	20,70	134137 0080	28,-	134136 0080	14,45
M 10	1.5	100	20	39	10	8	8.50	134135 0100	24,50	134137 0100	32,80	134136 0100	17,10
M 12	1.75	110	22	-	9	7	10.25	134135 0120	35,30	134137 0120	45,60	134136 0120	24,80
M 16	2.0	110	28	-	12	9	14.00	134135 0160	54,50	134137 0160	68,70		
M 20	2.5	140	32	-	16	12	17.50	134135 0200	91,60	134137 0200	113,-		
								1127		1127		1156	



### ATORN® Machine tap

M 60° HSS-E PM DIN 371 DIN 376 ISO 2 6H 2-3 45° 3xD TiCN Vc/tz 407

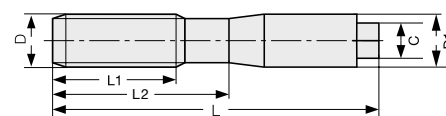
- ISO 6H metric thread
- 45°, spiral-fluted
- Type C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- For deep blind bore threads
- Easy chip removal to the rear
- Possible thread depth 3 x D

**Ideal for steel and stainless steel**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		5-40	5-30	5-20	5-20	5-24	5-15			2-6									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	6	18	3.5	2.7	2.50	134193 0305	27,50
M 4	0.7	63	7	21	4.5	3.4	3.30	134193 0407	27,50
M 5	0.8	70	8	25	6	4.9	4.20	134193 0508	27,60
M 6	1.0	80	10	30	6	4.9	5.00	134193 0610	29,-
M 8	1.25	90	13	35	8	6.2	6.80	134193 0812	34,80
M 10	1.5	100	15	39	10	8	8.50	134193 1015	40,60
M 12	1.75	110	18	-	9	7	10.25	134193 1217	56,-
M 16	2.0	110	20	-	12	9	14.00	134193 1620	84,50



1127

### ATORN® Machine tap

M 60° HSS-E PM DIN 371 DIN 376 ISO 2 6H 3,5-5 3xD TiCN Vc/tz 407

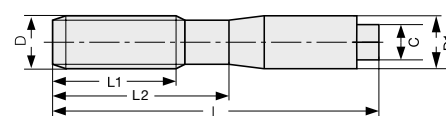
- ISO 6H metric thread
- Straight-fluted with spiral point
- Type B, 3,5-5 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- For through-hole threads
- Possible thread depth 3 x D

**Ideal for steel and stainless steel**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		5-40	5-30	5-20	5-20	5-24	5-15			2-6									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	6	18	3.5	2.7	2.50	134196 0305	27,-
M 4	0.7	63	7	21	4.5	3.4	3.30	134196 0407	27,-
M 5	0.8	70	8	25	6	4.9	4.20	134196 0508	27,10
M 6	1.0	80	10	30	6	4.9	5.00	134196 0610	28,50
M 8	1.25	90	13	35	8	6.2	6.80	134196 0812	34,30
M 10	1.5	100	15	39	10	8	8.50	134196 1015	40,90
M 12	1.75	110	18	-	9	7	10.25	134196 1217	55,-
M 16	2.0	110	20	-	12	9	14.00	134196 1620	82,40



1127

## ATORN® SARA® Machine tap

M 60° HSS-E DIN 371 DIN 376 ISO 2 6H 2-3 40° 2,5xD TiN Vap. i Vc/tz 407

- Metric ISO 6H thread
- 40° spiral-fluted
- Form C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated; HSS-E, TiN-coated**
- For blind-hole threads, minimum thread relief grinding

**For stainless steel**

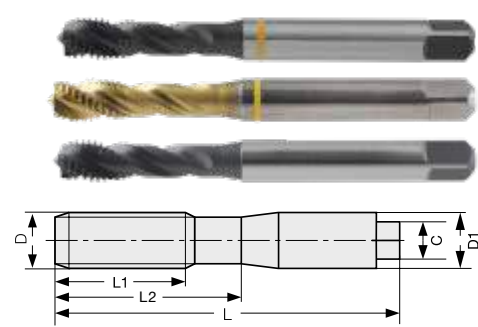
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
134225....					●	●	●													
134226....					●	●	●													
134227....					●	●	○													

5-10 5-12 5-8  
5-20 5-24 5-15  
5-8 5-8 5-8

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	ATORN® Vapour-treated		ATORN® TiN		SARA® Vapour-treated	
								art.no.	€	art.no.	€	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	134225 0020	23,90				
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134225 0025	19,85				
M 3	0.5	56	6	18	3.5	2.7	2.50	134225 0030	15,90	134226 0030	24,80	134227 0030	11,15
M 4	0.7	63	7	21	4.5	3.4	3.30	134225 0040	15,90	134226 0040	24,80	134227 0040	11,15
M 5	0.8	70	8	25	6	4.9	4.20	134225 0050	16,10	134226 0050	24,90	134227 0050	11,25
M 6	1.0	80	10	30	6	4.9	5.00	134225 0060	16,50	134226 0060	26,10	134227 0060	11,55
M 8	1.25	90	13	35	8	6.2	6.80	134225 0080	20,50	134226 0080	31,50	134227 0080	14,35
M 10	1.5	100	15	39	10	8	8.50	134225 0100	24,40	134226 0100	36,40	134227 0100	17,05
M 12	1.75	110	18	-	9	7	10.25	134225 0120	35,10	134226 0120	50,50	134227 0120	24,70
M 16	2.0	110	20	-	12	9	14.00	134225 0160	54,-	134226 0160	75,80		
M 20	2.5	140	25	-	16	12	17.50	134225 0200	91,10				

1127 1127 1156



## ATORN® SARA® Machine tap

M 60° HSS-E DIN 371 DIN 376 ISO 2 6H 3,5-5 3xD TiN Vap. i Vc/tz 407

- Metric ISO 6H thread
- Straight-fluted
- With spiral point, Form B, 3.5 to 5-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated; HSS-E, TiN-coated**
- For through-hole threads

**For stainless steel**

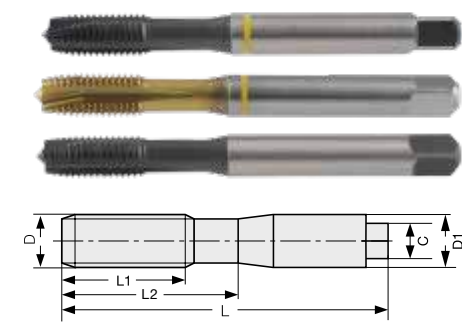
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
134130....					●	●	●													
134131....					●	●	●													
134132....					●	●	○													

5-10 5-12 5-8  
5-20 5-24 5-15  
5-8 5-8 5-8

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	ATORN® Vapour-treated		ATORN® TiN		SARA® Vapour-treated	
								art.no.	€	art.no.	€	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	134130 0020	23,90				
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134130 0025	19,65				
M 3	0.5	56	10	18	3.5	2.7	2.50	134130 0030	15,90	134131 0030	24,60	134132 0030	11,15
M 4	0.7	63	12	21	4.5	3.4	3.30	134130 0040	15,90	134131 0040	24,60	134132 0040	11,15
M 5	0.8	70	14	25	6	4.9	4.20	134130 0050	16,-	134131 0050	24,70	134132 0050	11,25
M 6	1.0	80	16	30	6	4.9	5.00	134130 0060	16,50	134131 0060	25,90	134132 0060	11,50
M 8	1.25	90	18	35	8	6.2	6.80	134130 0080	20,40	134131 0080	31,20	134132 0080	14,25
M 10	1.5	100	20	39	10	8	8.50	134130 0100	24,20	134131 0100	36,40	134132 0100	16,90
M 12	1.75	110	22	-	9	7	10.25	134130 0120	34,70	134131 0120	50,10	134132 0120	24,40
M 16	2.0	110	28	-	12	9	14.00	134130 0160	53,40	134131 0160	75,30		
M 20	2.5	140	32	-	16	12	17.50	134130 0200	90,60				

1127 1127 1156





## ATORN® Machine tap



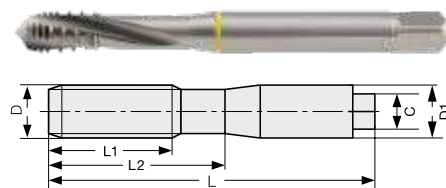
- **ISO 6H metric thread**
- Type C, 2 to 3-thread chamfer, 15°, spiral-fluted with exposed ridges
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E**
- For blind bore threads, easy chip removal to the rear
- Possible thread depth 2xD

**Exposed thread ridges**

material	● very well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	alloys	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
					● 5-10	● 5-12	● 5-8												

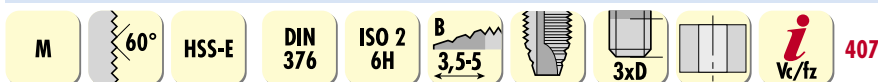
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	6.0	18	3.5	2.7	2.50	135390 0030	24,40
M 4	0.7	63	7.5	21	4.5	3.4	3.30	135390 0040	24,40
M 5	0.8	70	8.5	25	6	4.9	4.20	135390 0050	25,20
M 6	1.0	80	11.0	30	6	4.9	5.00	135390 0060	24,80
M 8	1.25	90	14.0	35	8	6.2	6.80	135390 0080	29,—
M 10	1.5	100	16.0	39	10	8.0	8.50	135390 0100	36,50
M 12	1.75	110	18.5	-	9	7.0	10.25	135390 0120	44,80
M 16	2.0	110	20.0	-	12	9.0	14.00	135390 0160	62,60
M 20	2.5	140	25.0	-	16	12.0	17.50	135390 0200	100,50



1127

## ATORN® Machine tap



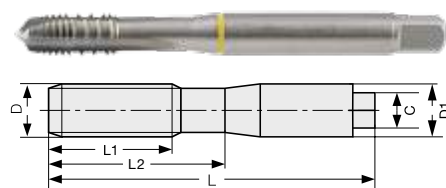
- **ISO 6H metric thread**
- Straight-fluted, with exposed thread ridges
- Type B, 3.5-5 thread chamfer
- Constructional dimensions DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E**
- For through-hole threads in materials that tend to jam, thin-walled parts and pipes
- Possible thread depth 3 x D

**Exposed thread ridges**

material	● very well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	alloys	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
					● 5-10	● 5-12	● 5-8												

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	135140 0030	39,10
M 4	0.7	63	12	21	4.5	3.4	3.30	135140 0040	33,80
M 5	0.8	70	14	25	6	4.9	4.20	135140 0050	30,40
M 6	1.0	80	16	30	6	4.9	5.00	135140 0060	34,60
M 8	1.25	90	17	35	8	6.2	6.80	135140 0080	39,70
M 10	1.5	100	20	39	10	8	8.50	135140 0100	48,30
M 12	1.75	110	24	-	9	7	10.25	135140 0120	68,20
M 16	2.0	110	26	-	12	9	14.00	135140 0160	106,—



1127

## ATORN® Machine tap



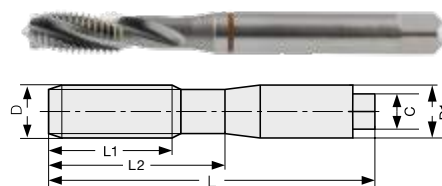
- **Metric ISO 6H thread**
- Form D, 3,5-5 thread chamfer, 20°, spiral-fluted
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM**
- For blind-hole threads, easy chip removal to the rear
- Possible thread depth 2.5 x D

**For titanium and superalloys**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	2-6	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	134192 0030	29,10
M 4	0.7	63	12	21	4.5	3.4	3.30	134192 0040	29,10
M 5	0.8	70	14	25	6	4.9	4.20	134192 0050	27,90
M 6	1.0	80	16	30	6	4.9	5.00	134192 0060	27,90
M 8	1.25	90	18	35	8	6.2	6.80	134192 0080	34,40
M 10	1.5	100	20	39	10	8.0	8.50	134192 0100	38,80
M 12	1.75	110	22	-	9	7.0	10.25	134192 0120	47,40
M 16	2.0	110	28	-	12	9.0	14.00	134192 0160	71,20

1127



## ATORN® Machine tap



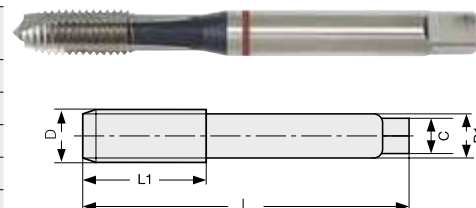
- **Metric ISO 6HX thread**
- Straight-fluted with spiral point, Form B, 3.5 to 5-thread chamfer
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM**
- For through-hole threads
- The spiral point ensures strong chip removal to the front
- Possible thread depths 3 x D

**For titanium and superalloys**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	2-6	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	3.5	2.7	2.50	134142 0030	29,40
M 4	0.7	63	12	4.5	3.4	3.30	134142 0040	29,80
M 5	0.8	70	14	6.0	4.9	4.20	134142 0050	28,60
M 6	1.0	80	16	6.0	4.9	5.00	134142 0060	28,60
M 8	1.25	90	18	8.0	6.2	6.80	134142 0080	34,90
M 10	1.5	100	20	10.0	8.0	8.50	134142 0100	39,30
M 12	1.75	110	22	9.0	7.0	10.25	134142 0120	48,20
M 16	2.0	110	28	12.0	9.0	14.00	134142 0160	72,30

1127



## ATORN® Machine tap



- **ISO 6H metric thread**
- Type C, 2 to 3-thread chamfer, 45° spiral-fluted
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E**
- For blind bore threads, with enlarged chip space
- Possible thread depth 2.5 x D

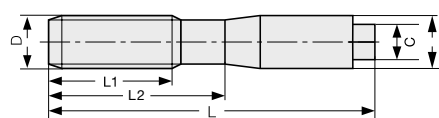
**For aluminium**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													●	●	●				
													20-40	10-25	10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	134195 0020	20,20
M 3	0.5	56	6	18	3.5	2.7	2.50	134195 0030	14,80
M 4	0.7	63	7	21	4.5	3.4	3.30	134195 0040	15,05
M 5	0.8	70	8	25	6	4.9	4.20	134195 0050	15,70
M 6	1.0	80	10	30	6	4.9	5.00	134195 0060	15,80
M 8	1.25	90	13	35	8	6.2	6.80	134195 0080	20,90
M 10	1.5	100	15	39	10	8	8.50	134195 0100	25,60
M 12	1.75	110	18	-	9	7	10.25	134195 0120	39,10

1127



## ATORN® Machine tap



- **ISO 6H metric thread**
- Straight-fluted with spiral point, type B, 3.5 to 5-thread chamfer
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E**
- For through-hole threads
- With enlarged chip space
- The spiral point ensures strong chip removal to the front
- Possible thread depths 3xD

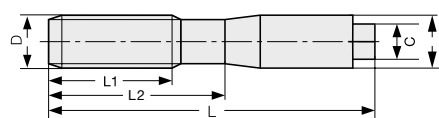
**For aluminium**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													●	●	●				
													20-40	10-25	10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	134127 0030	13,-
M 4	0.7	63	12	21	4.5	3.4	3.30	134127 0040	13,10
M 5	0.8	70	14	25	6.0	4.9	4.20	134127 0050	13,75
M 6	1.0	80	16	30	6.0	4.9	5.00	134127 0060	13,85
M 8	1.25	90	18	35	8.0	6.2	6.80	134127 0080	18,25
M 10	1.5	100	20	39	10.0	8.0	8.50	134127 0100	22,40
M 12	1.75	110	22	-	9.0	7.0	10.25	134127 0120	34,30

1127



## ATORN® Synchronised machine tap

M 60° HSS-E DIN 371 DIN 376 ISO 2 6H Synchro C 2-3 40° 2,5xD TiN Vc/fz 407

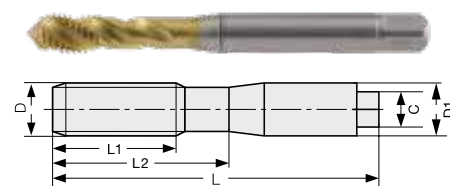
- ISO 6H metric thread
- 40°, spiral-fluted
- Type C, 2 to 3-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, TiN-coated**
- For blind-hole threads
- Minimal thread relief grinding
- Possible thread depth 2.5 x D
- Suitable for CNC machining centres with synchro tap chucks

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Co-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		5-40	5-30	5-20	5-20	5-24	5-15	8-30	8-30				30-60	10-30	10-20					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	6	18	3.5	2.7	2.50	135350 0030	26,30
M 4	0.7	63	7.5	21	4.5	3.4	3.30	135350 0040	27,80
M 5	0.8	70	8.5	25	6	4.9	4.20	135350 0050	28,20
M 6	1.0	80	11	30	6	4.9	5.00	135350 0060	33,80
M 8	1.25	90	14	35	8	6.2	6.80	135350 0080	39,30
M 10	1.5	100	16	39	10	8	8.50	135350 0100	46,70
M 12	1.75	110	18.5	-	9	7	10.25	135350 0120	60,60
M 14	2.0	110	20	-	11	9	12.00	135350 0140	81,40
M 16	2.0	110	20	-	12	9	14.00	135350 0160	81,40
M 18	2.5	125	25	-	14	11	15.50	135350 0180	112,-
M 20	2.5	140	25	-	16	12	17.50	135350 0200	137,50
M 24	3.0	160	30	-	18	14.5	21.00	135350 0240	165,-

1127



## ATORN® Synchronised machine tap

M 60° HSS-E DIN 371 DIN 376 ISO 2 6H Synchro B 3,5-5 3xD TiN Vc/fz 407

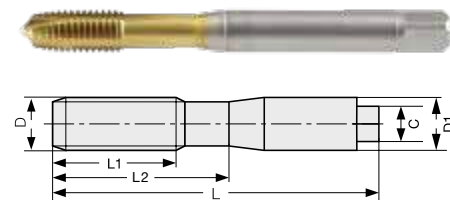
- ISO 6H metric thread
- Straight-fluted with spiral point
- Type B, 3.5-5 thread chamfer
- Constructional dimensions DIN 371 = up to M 10, DIN 376 = from M12
- **Cutting material: HSS-E, TiN-coated**
- For through-hole threads
- Possible thread depth 3 x D
- Suitable for conventional and CNC machining using synchronised tap chucks

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Co-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		5-40	5-30	5-20	5-20	5-24	5-15	8-30	8-30				30-60	10-30	10-20					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	135385 0030	20,70
M 4	0.7	63	12	21	4.5	3.4	3.30	135385 0040	21,40
M 5	0.8	70	14	25	6	4.9	4.20	135385 0050	21,80
M 6	1.0	80	16	30	6	4.9	5.00	135385 0060	26,10
M 8	1.25	90	17	35	8	6.2	6.80	135385 0080	28,90
M 10	1.5	100	20	39	10	8.0	8.50	135385 0100	40,70
M 12	1.75	110	24	-	9	7.0	10.25	135385 0120	48,20
M 14	2.0	110	26	-	11	9.0	12.00	135385 0140	64,60
M 16	2.0	110	26	-	12	9.0	14.00	135385 0160	67,20
M 18	2.5	125	30	-	14	11.0	15.50	135385 0180	81,40
M 20	2.5	140	32	-	16	12.0	17.50	135385 0200	87,50
M 24	3.0	160	36	-	18	14.5	21.00	135385 0240	109,-

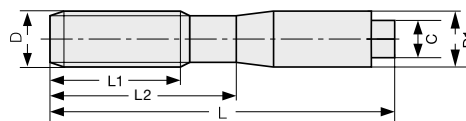
1127



# ATORN® Synchronised machine tap

M
HSS-E PM
DIN 371
DIN 376
ISO 2 6HX
Synchro
C 2-3
50°
2,5xD
TiN
i Vc/fz 407

- ISO 6HX metric thread
- 50°, spiral-fluted
- Type C, 2-3 thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiN-coated**
- For blind-hole threads
- Possible thread depth 2.5 x D
- **Minimum-sized guide piece and extremely large clearance angle**
- Shank tolerance = h6
- For synchronous tap chucks



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
		5-40	5-30	5-20	5-20	5-24	5-15	8-30	8-30			30-60	10-30	10-20				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 4	0.7	63	3.5	21	4.5	3.4	3.30	134575 0040	42,-
M 5	0.8	70	4.0	25	6	4.9	4.20	134575 0050	41,-
M 6	1.0	80	5.0	30	6	4.9	5.00	134575 0060	45,-
M 8	1.25	90	6.3	35	8	6.2	6.80	134575 0080	52,90
M 10	1.5	100	7.5	39	10	8	8.50	134575 0100	64,60
M 12	1.75	110	8.8	-	9	7	10.25	134575 0120	85,50
M 14	2.0	110	10.0	-	11	9	12.00	134575 0140	100,50
M 16	2.0	110	10.0	-	12	9	14.00	134575 0160	124,-
M 20	2.5	140	12.5	-	16	12	17.50	134575 0200	178,-



Set	Contents	art.no.	€
	5-piece set: M5, M6, M8, M10, M12	134575 1005	224,-

**YOUR DRILL**

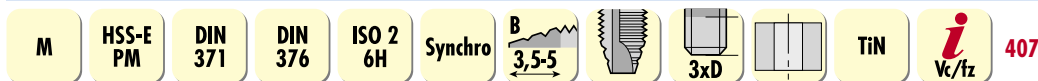
# GIVES UP. • WHAT DO YOU DO? YOU REACH FOR A NEW ONE

**AND SIMPLY CARRY ON: SARAGO TOOL DISPENSING SYSTEM.**

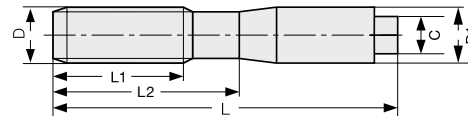
**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
POWER TO PRODUCE  
A BRAND OF SARTORIUS WERKZEUGE

## ATORN® Synchronised machine tap



- ISO 6H metric thread
- Straight-fluted with spiral point
- Type B, 3.5-5 thread chamfer
- Constructional dimensions DIN 371 = up to M 10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiN-coated**
- For through-hole threads
- Possible thread depth 3 x D
- Suitable for conventional and CNC machining using synchronised tap chucks



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	○	●	●	○	●	●				○	○	○					
		20-25	15-20	10-15	10-18	10-18	10-15	8-30	8-30				25-30	25-30	25-30					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	134570 0020	28,10
M 3	0.5	56	10	18	3.5	2.7	2.50	134570 0030	28,10
M 4	0.7	63	12	21	4.5	3.4	3.30	134570 0040	28,90
M 5	0.8	70	14	25	6	4.9	4.20	134570 0050	29,50
M 6	1.0	80	16	30	6	4.9	5.00	134570 0060	34,60
M 8	1.25	90	17	35	8	6.2	6.80	134570 0080	39,10
M 10	1.5	100	20	39	10	8.0	8.50	134570 0100	55,-
M 12	1.75	110	24	-	9	7.0	10.25	134570 0120	65,10
M 14	2.0	110	26	-	11	9.0	12.00	134570 0140	86,50
M 16	2.0	110	26	-	12	9.0	14.00	134570 0160	87,50
M 18	2.5	125	30	-	14	11.0	15.50	134570 0180	142,50
M 20	2.5	140	32	-	16	12.0	17.50	134570 0200	147,50



Set		Contents	art.no.	€
		5-piece set: M5, M6, M8, M10, M12	134570 1005	201,-

RIGHT ACROSS **EUROPE.**

WE MANAGE THAT FOR YOU

**WITHIN 24 HOURS:**

**24-HOUR DELIVERY**

**THROUGHOUT EUROPE**

THAT'S POWER TO PRODUCE

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE



**ATORN® Machine tap**

M
60°
HSS-E
DIN 371
DIN 376
ISO 2 6HX
C 2-3
3xD
Nit.
i Vc/fz 407

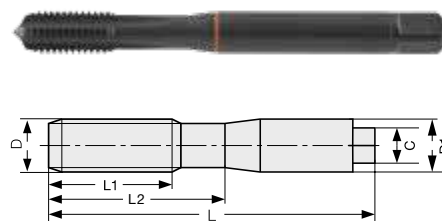
- **Metric ISO 6HX thread**
- Straight-fluted, without spiral point
- Form C, 2-3 thread chamfer
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, nitrided**
- For blind-hole and through-hole threads
- Possible thread depth 3 x D

**For cast iron**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
								● 8-20	● 8-20				○ 10-25	○ 10-12					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	135155 0030	14,65
M 4	0.7	63	12	21	4.5	3.4	3.30	135155 0040	14,45
M 5	0.8	70	14	25	6	4.9	4.20	135155 0050	15,80
M 6	1.0	80	17	30	6	4.9	5.00	135155 0060	15,80
M 8	1.25	90	18	35	8	6.2	6.80	135155 0080	19,15
M 10	1.5	100	20	39	10	8	8.50	135155 0100	22,60
M 12	1.75	110	24	-	9	7	10.25	135155 0120	29,70
M 16	2.0	110	26	-	12	9	14.00	135155 0160	42,60
M 18	2.5	125	30	-	14	11	15.50	135155 0180	69,20
M 20	2.5	140	32	-	16	12	17.50	135155 0200	69,70
M 24	3.0	160	36	-	18	14.5	21.00	135155 0240	92,60



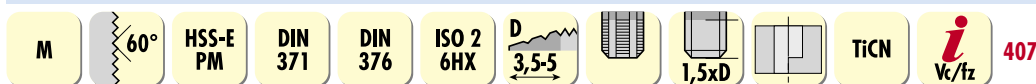
1127

**WHEN**  
**ADDITIVE**  
**IS A FAMILIAR WORD IN**  
**MANUFACTURING.**

**THAT'S POWER TO PRODUCE**

  
**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE

## ATORN® Machine tap

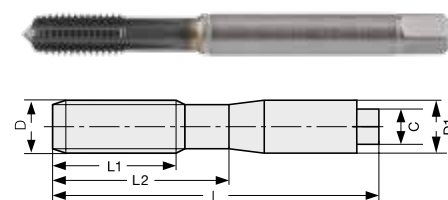


- **ISO 6HX metric thread**
- Type D, 3,5 to 5-thread chamfer, for blind bore and through-hole threads
- Similar to DIN 371 = up to M10, similar to DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- Possible thread depth 1.5xD

**Hard machining < 55 HRC**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																			

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	135165 0030	59,-
M 4	0.7	63	12	21	4.5	3.4	3.30	135165 0040	62,60
M 5	0.8	70	14	25	6	4.9	4.20	135165 0050	67,70
M 6	1.0	80	16	30	6	4.9	5.00	135165 0060	62,60
M 8	1.25	90	18	35	8	6.2	6.80	135165 0080	69,20
M 10	1.5	100	20	39	10	8	8.50	135165 0100	91,10
M 12	1.75	110	22	-	9	7	10.25	135165 0120	111,-
M 16	2.0	110	28	-	12	9	14.00	135165 0160	143,50



1127

## ATORN® Machine tap

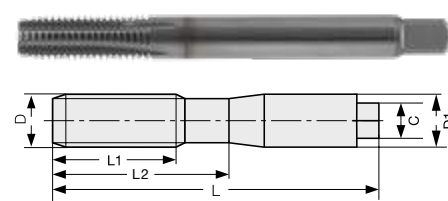


- **ISO 6H metric thread**
- Type D, 3,5 to 5-thread chamfer, for blind bore and through-hole threads
- Similar to DIN 371
- **Cutting material: superfine grain solid carbide, TiCN-coated**
- Possible thread depth 1.5xD

**Hard machining ≥ 60 HRC**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																			

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	12	18	3.5	2.7	2.50	135170 0030	140,50
M 4	0.7	63	14	21	4.5	3.4	3.30	135170 0040	144,50
M 5	0.8	70	17	25	6	4.9	4.20	135170 0050	156,-
M 6	1.0	80	20	30	6	4.9	5.00	135170 0060	173,-
M 8	1.25	90	20	35	8	6.2	6.80	135170 0080	183,50
M 10	1.5	100	24	39	10	8	8.50	135170 0100	214,-
M 12	1.75	110	28	-	12	9	10.25	135170 0120	301,-
M 16	2.0	110	40	-	16	12	14.00	135170 0160	499,-



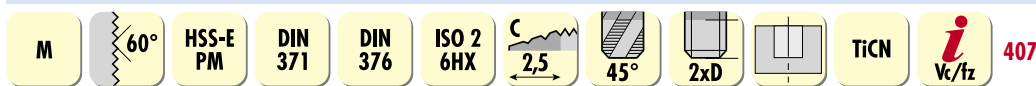
1127



... with brainpower.

**ATORN®**  
Performance demands quality

## A-SFT machine tap

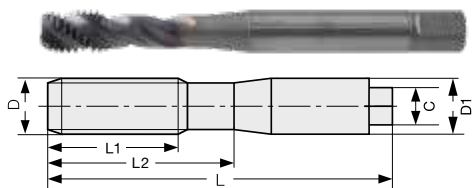


- ISO 6HX metric thread
- 45°, spiral-fluted
- Type C, 2.5-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- For blind-hole threads
- **additional versions available**

**Accelerated chip removal due to irregular twisted flute**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	G6/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-60	10-60	8-30	8-20	8-20				5-10			15-35	15-35	15-35				

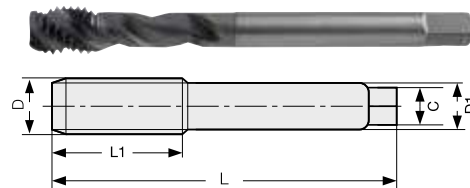
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



DIN 371

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	3.2	-	2.8	2.1	1.60	133400 0020	28,60
M 2.5	0.45	50	3.6	-	2.8	2.1	2.10	133400 0025	28,40
M 3	0.5	56	4	18	3.5	2.7	2.50	133400 0030	24,90
M 4	0.7	63	5.6	21	4.5	3.4	3.30	133400 0040	25,70
M 5	0.8	70	6.4	25	6	4.9	4.20	133400 0050	26,30
M 6	1.0	80	8	30	6	4.9	5.00	133400 0060	26,50
M 8	1.25	90	10	35	8	6.2	6.80	133400 0080	31,70
M 10	1.5	100	12	39	10	8	8.50	133400 0100	38,60

1128

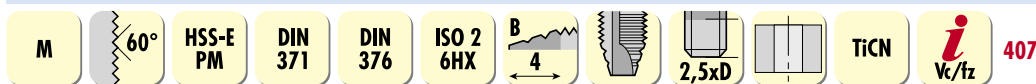


DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.75	110	14	9	7	10.30	133405 0120	48,60
M 14	2.0	110	16	11	9	12.00	133405 0140	57,60
M 16	2.0	110	16	12	9	14.00	133405 0160	67,50
M 18	2.5	125	25	14	11	15.50	133405 0180	91,60
M 20	2.5	140	25	16	12	17.50	133405 0200	108,20
M 22	2.5	140	25	18	14.5	19.50	133405 0220	118,40
M 24	3.0	160	30	18	14.5	21.00	133405 0240	145,40

1128

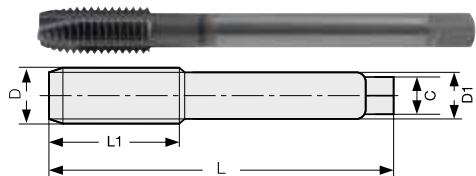
## A-POT machine tap



- ISO 6HX metric thread
- Straight-fluted with spiral point
- Type B, 4-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- For through-hole threads
- **additional versions available**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	G6/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-60	10-60	8-30	8-20	8-20				5-10			15-35	15-35	15-35				

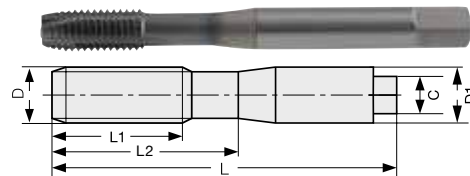
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



DIN 371

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	133450 0020	28,-
M 2.5	0.45	50	9	-	2.8	2.1	2.10	133450 0025	27,70
M 3	0.5	56	11	18	3.5	2.7	2.50	133450 0030	24,20
M 4	0.7	63	13	21	4.5	3.4	3.30	133450 0040	24,80
M 5	0.8	70	16	25	6	4.9	4.20	133450 0050	25,50
M 6	1.0	80	19	30	6	4.9	5.00	133450 0060	25,80
M 8	1.25	90	22	35	8	6.2	6.80	133450 0080	30,90
M 10	1.5	100	24	39	10	8	8.50	133450 0100	37,70

1128



DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.75	110	28	9	7	10.25	133455 0120	47,60
M 14	2.0	110	30	11	9	12.00	133455 0140	56,60
M 16	2.0	110	32	12	9	14.00	133455 0160	66,40
M 18	2.5	125	34	14	11	15.50	133455 0180	89,90
M 20	2.5	140	34	16	12	17.50	133455 0200	106,50
M 22	2.5	140	34	18	14.5	19.50	133455 0220	116,10
M 24	3.0	160	38	18	14.5	21.00	133455 0240	142,70

1128

## A-SFT machine tap, with Weldon clamping surface

M
60°
HSS-E PM
DIN 371
ISO 2 6HX
C 2,5
45°
DIN 1835 B
TiCN
i Vc/tz
407

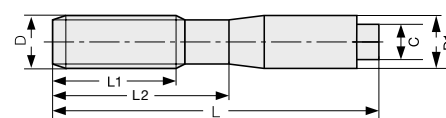
- **Metric ISO 6HX thread**
- 45°, spiral-fluted
- Form C, 2.5-thread chamfer
- Constructional dimensions DIN 371
- **Cutting material: HSS-E-PM, TiCN-coated**
- For blind-hole threads
- **Additional versions available**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 15-60	● 10-60	○ 8-30	● 8-20	● 8-20				○ 5-10			○ 15-35	○ 15-35	○ 15-35					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	4	18	6	4.9	2.5	133490 0030	26,90
M 4	0.7	63	5.6	21	6	4.9	3.3	133490 0040	27,70
M 5	0.8	70	6.4	25	6	4.9	4.2	133490 0050	28,50
M 6	1.0	80	8	30	6	4.9	5	133490 0060	28,80
M 8	1.25	90	10	35	8	6.2	6.8	133490 0080	34,50
M 10	1.5	100	12	39	10	8	8.5	133490 0100	42,10
M 12	1.75	110	14	46	12	9	10.3	133490 0120	53,-
M 14	2.0	110	16	49	14	11	12	133490 0140	63,20
M 16	2.0	110	16	56	16	12	14	133490 0160	74,20



1128

## A-POT machine tap, with Weldon clamping surface

M
60°
HSS-E PM
DIN 371
ISO 2 6HX
B 4
45°
DIN 1835 B
TiCN
i Vc/tz
407

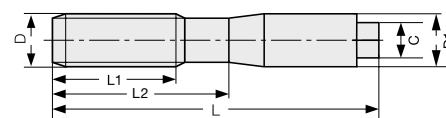
- **Metric ISO 6HX thread**
- Straight-fluted with spiral point
- Form B, 4-thread chamfer
- Constructional dimensions DIN 371
- **Cutting material: HSS-E-PM, TiCN-coated**
- For through-hole threads
- **Additional versions available**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 15-60	● 10-60	○ 8-30	● 8-20	● 8-20				○ 5-10			○ 15-35	○ 15-35	○ 15-35					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	11	18	6	4.9	2.5	133495 0030	26,20
M 4	0.7	63	13	21	6	4.9	3.3	133495 0040	26,80
M 5	0.8	70	16	25	6	4.9	4.2	133495 0050	27,60
M 6	1	80	19	30	6	4.9	5	133495 0060	27,90
M 8	1.25	90	22	35	8	6.2	6.8	133495 0080	33,40
M 10	1.5	100	24	39	10	8	8.5	133495 0100	41,-
M 12	1.75	110	28	46	12	9	10.25	133495 0120	51,50
M 14	2	110	30	49	14	11	12	133495 0140	61,30
M 16	2	110	32	56	16	12	14	133495 0160	72,10



1128

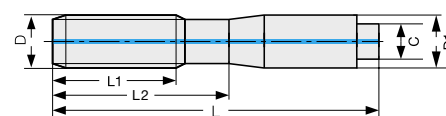
## A-OIL-SFT machine tap, with internal cooling



- ISO 6HX metric thread
- 45°, spiral-fluted
- Type C, 2.5-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- For blind-hole threads
- **With internal cooling**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-60	10-60	8-30	8-20	8-20				5-10			15-35	15-35	15-35				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



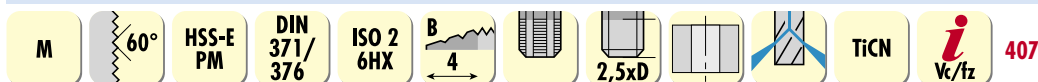
D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 6	1.0	80	8	30	6	4.9	5	133410 0060	43,30
M 8	1.25	90	10	35	8	6.2	6.8	133410 0080	49,-
M 10	1.5	100	12	39	10	8	8.5	133410 0100	54,60
M 12	1.75	110	14	-	9	7	10.2	133415 0120	69,50
M 14	2.0	110	16	-	11	9	12	133415 0140	77,70
M 16	2.0	110	16	-	12	9	14	133415 0160	88,30
M 18	2.5	125	25	-	14	11	15.5	133415 0180	127,30
M 20	2.5	140	25	-	16	12	17.5	133415 0200	150,70
M 22	2.5	140	25	-	18	14.5	19.5	133415 0220	164,60
M 24	3.0	160	30	-	18	14.5	21	133415 0240	202,-

1128

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 27	3.0	160	36	-	20	16	24	133415 0270	260,80
M 30	3.5	180	42	-	22	18	26.5	133415 0300	323,20
M 33	3.5	180	42	-	25	20	29.5	133415 0330	363,40
M 36	4.0	200	48	-	28	22	32	133415 0360	400,50
M 39	4.0	200	48	-	32	24	35	133415 0390	479,90
M 42	4.5	200	54	-	32	24	37.5	133415 0420	591,10
M 45	4.5	220	54	-	36	29	40.5	133415 0450	699,90
M 48	5.0	250	60	-	36	29	43	133415 0480	813,60
M 52	5.0	250	60	-	40	32	47	133415 0520	1.074,-
M 56	5.5	250	66	-	40	32	50.5	133415 0560	1.186,90

1128

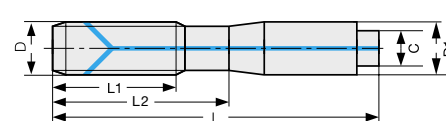
## A-OIL-POT machine tap, with internal cooling



- ISO 6HX metric thread
- Straight-fluted with spiral point
- Type B, 4-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- For through-hole threads
- **With internal cooling**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-60	10-60	8-30	8-20	8-20				5-10			15-35	15-35	15-35				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 6	1.0	80	19	30	6	4.9	5	133456 0060	44,60
M 8	1.25	90	22	35	8	6.2	6.8	133456 0080	50,20
M 10	1.5	100	24	39	10	8	8.5	133456 0100	55,80
M 12	1.75	110	29	-	9	7	10.2	133456 0120	70,20
M 14	2.0	110	30	-	11	9	12	133456 0140	82,30
M 16	2.0	110	32	-	12	9	14	133456 0160	94,10
M 18	2.5	125	34	-	14	11	15.5	133456 0180	127,-
M 20	2.5	140	34	-	16	12	17.5	133456 0200	150,50
M 22	2.5	140	34	-	18	14.5	19.5	133456 0220	164,30
M 24	3.0	160	38	-	18	14.5	21	133456 0240	201,70

1128

## Machine tap A-SFT, with short chamfer

M
60°
HSS-E PM
DIN 371
DIN 376
ISO 2 6HX
E 1,5-2
45°
2,5xD
TiCN
i Vc/tz
407

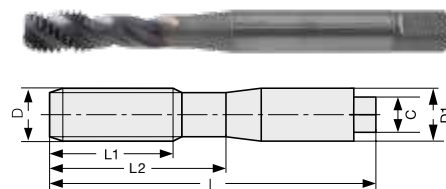
- **Metric ISO 6HX thread**
- 40° spiral-fluted
- **With short chamfer Form E, 1.5-thread chamfer**
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- For blind-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	<700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si		<55 HRc	<60 HRc	≥60 HRc
		● 15-60	● 10-60	○ 8-30	● 8-20	● 8-20				○ 5-10			○ 15-35	○ 15-35	○ 15-35			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	4	18	3.5	2.7	2.5	133570 0030	24,90
M 4	0.7	63	5.6	21	4.5	3.4	3.3	133570 0040	25,70
M 5	0.8	70	6.4	25	6	4.9	4.2	133570 0050	26,30
M 6	1.0	80	8	30	6	4.9	5	133570 0060	26,50
M 8	1.25	90	10	35	8	6.2	6.8	133570 0080	31,70
M 10	1.5	100	12	39	10	8	8.5	133570 0101	38,60
M 12	1.75	110	14	-	9	7	10.25	133570 1217	48,60
M 14	2.0	110	16	-	11	9	12	133570 1402	57,60
M 16	2.0	110	16	-	12	9	14	133570 0162	67,50

1128



## Machine tap S-SFT, with short chamfer

M
60°
HSS-E
DIN 371
DIN 376
ISO 2 6H
E 1,5-2
40°
2,5xD
Vap.
i Vc/tz
407

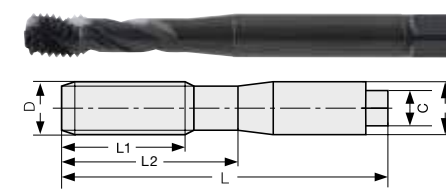
- **Metric ISO 6H thread**
- 40° spiral-fluted
- **With short chamfer Form E, 1.5-thread chamfer**
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated**
- For blind-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	<700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si		<55 HRc	<60 HRc	≥60 HRc
		● 15-24	● 10-15	○ 8-13	● 8-16	● 8-16	○ 5-8		○ 10-15						○ 12-17			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	4	18	3.5	2.7	2.5	133867 0030	15,90
M 4	0.7	63	5.6	21	4.5	3.4	3.3	133867 0040	16,10
M 5	0.8	70	6.4	25	6	4.9	4.2	133867 0050	16,70
M 6	1	80	8	30	6	4.9	5	133867 0060	16,80
M 8	1.25	90	10	35	8	6.2	6.8	133867 0080	19,40
M 10	1.5	100	12	39	10	8	8.5	133867 0100	24,40
M 12	1.75	110	14	-	9	7	10.2	133867 0120	30,-
M 14	2	110	16	-	11	9	12	133867 0140	37,10
M 16	2	110	16	-	12	9	14	133867 0160	43,40

1128

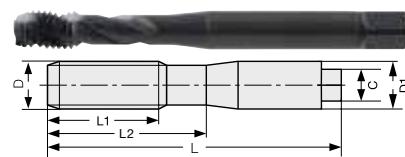




## S-SFT machine tap

M
60°
HSS-E
DIN 371
DIN 376
ISO 2 6H
C 2,5
40°
2,5xD
Vap.
i Vc/fz
407

- ISO 6H metric thread
- 40°, spiral-fluted
- Type C, 2.5-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated**
- For blind-hole threads



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
		15-24	10-15	8-13	8-16	8-16	5-8		10-15					12-17					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 1	0.25	40	5	-	2.5	2.1	0.75	133865 0010	24,90
M 1.1	0.25	40	5	-	2.5	2.1	0.85	133865 0011	24,90
M 1.2	0.25	40	5	-	2.5	2.1	0.95	133865 0012	24,90
M 1.4	0.3	40	6	-	2.5	2.1	1.1	133865 0014	21,70
M 1.6	0.35	40	7	-	2.5	2.1	1.25	133865 0016	21,70
M 1.7	0.35	40	8	-	2.5	2.1	1.35	133865 0017	20,30
M 1.8	0.35	40	8	-	2.5	2.1	1.45	133865 0018	20,30
M 2	0.4	45	4	10	2.8	2.1	1.6	133865 0020	16,60
M 2.2	0.45	45	5	11	2.8	2.1	1.75	133865 0022	18,10
M 2.3	0.4	45	4	12	2.8	2.1	1.9	133865 0023	17,70
M 2.5	0.45	50	4.5	13	2.8	2.1	2.05	133865 0025	17,90
M 2.6	0.45	50	4.5	13	2.8	2.1	2.15	133865 0026	16,60
M 3	0.5	56	5	18	3.5	2.7	2.5	133865 0030	15,60
M 3.5	0.6	56	6	20	4	3	2.9	133865 0035	16,40
M 4	0.7	63	7	21	4.5	3.4	3.3	133865 0040	15,90

1128

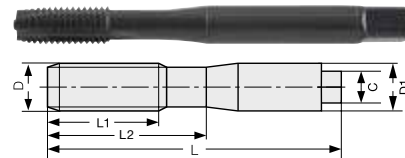
D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 4.5	0.75	70	7.5	25	6	4.9	3.7	133865 0045	21,20
M 5	0.8	70	8	25	6	4.9	4.2	133865 0050	16,50
M 5.5	0.9	80	9	30	6	4.9	4.6	133865 0055	24,70
M 6	1	80	10	30	6	4.9	5	133865 0060	16,60
M 7	1	80	10	30	7	5.5	6	133865 0070	22,20
M 8	1.25	90	13	35	8	6.2	6.8	133865 0080	19,-
M 10	1.5	100	15	39	10	8	8.5	133865 0100	24,10
M 12	1.75	110	18	-	9	7	10.2	133865 0120	29,50
M 14	2	110	20	-	11	9	12	133865 0140	36,50
M 16	2	110	20	-	12	9	14	133865 0160	42,80
M 18	2.5	125	25	-	14	11	15.5	133865 0180	57,90
M 20	2.5	140	25	-	16	12	17.5	133865 0200	68,30
M 22	2.5	140	25	-	18	14.5	19.5	133865 0220	74,30
M 24	3	160	30	-	18	14.5	21	133865 0240	91,50

1128

## S-POT machine tap

M
60°
HSS-E
DIN 371
DIN 376
ISO 2 6H
B 4
2,5xD
Vap.
i Vc/fz
407

- ISO 6H metric thread
- Straight-fluted with spiral point
- Type B, 4-thread chamfer
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated**
- For through-hole threads



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
		15-24	10-15	8-13	8-16	8-16	5-8		10-15					12-17					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 1	0.25	40	5	-	2.5	2.1	0.75	133875 0010	23,50
M 1.1	0.25	40	5	-	2.5	2.1	0.85	133875 0011	23,50
M 1.2	0.25	40	5	-	2.5	2.1	0.95	133875 0012	23,50
M 1.4	0.3	40	7	-	2.5	2.1	1.1	133875 0014	20,50
M 1.6	0.35	40	8	-	2.5	2.1	1.25	133875 0016	20,50
M 1.7	0.35	40	8	-	2.5	2.1	1.35	133875 0017	19,-
M 1.8	0.35	40	8	-	2.5	2.1	1.45	133875 0018	19,-
M 2	0.4	45	8	-	2.8	2.1	1.6	133875 0020	16,60
M 2.2	0.45	45	9	-	2.8	2.1	1.75	133875 0022	16,60
M 2.3	0.4	45	9	-	2.8	2.1	1.9	133875 0023	16,60
M 2.5	0.45	50	9	-	2.8	2.1	2.05	133875 0025	16,50
M 2.6	0.45	50	9	-	2.8	2.1	2.15	133875 0026	15,60
M 3	0.5	56	11	18	3.5	2.7	2.5	133875 0030	14,70
M 3.5	0.6	56	12	20	4	3	2.9	133875 0035	15,40
M 4	0.7	63	13	21	4.5	3.4	3.3	133875 0040	14,90

1128

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 4.5	0.75	70	16	25	6	4.9	3.7	133875 0045	19,90
M 5	0.8	70	16	25	6	4.9	4.2	133875 0050	15,50
M 5.5	0.9	80	17	30	5	4.9	4.6	133875 0055	23,10
M 6	1	80	19	30	6	4.9	5	133875 0060	15,60
M 7	1	80	19	30	7	5.5	6	133875 0070	20,90
M 8	1.25	90	22	35	8	6.2	6.8	133875 0080	17,80
M 9	1.25	90	19	35	9	7	7.8	133875 0090	24,10
M 10	1.5	100	24	39	10	8	8.5	133875 0100	22,30
M 12	1.75	110	28	-	9	7	10.2	133875 0120	27,50
M 14	2	110	30	-	11	9	12	133875 0140	34,20
M 16	2	110	32	-	12	9	14	133875 0160	39,80
M 18	2.5	125	34	-	14	11	15.5	133875 0180	53,60
M 20	2.5	140	34	-	16	12	17.5	133875 0200	63,50
M 22	2.5	140	34	-	18	14.5	19.5	133875 0220	69,60
M 24	3	160	38	-	18	14.5	21	133875 0240	85,30

1128

## Machine tap S-SFT, with Weldon clamping surface

M
60°
HSS-E
DIN 371
ISO 2 6H
C 2,5
40°
2,5xD
DIN 1835 B
Vap.
i Vc/tz 407

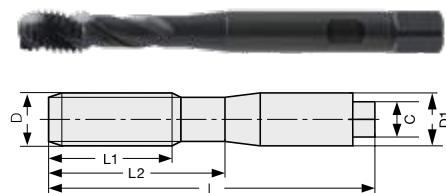
- **Metric ISO 6H thread**
- 40° spiral-fluted
- Form C, 2.5-thread chamfer
- Constructional dimensions DIN 371
- **Cutting material: HSS-E, vapour-treated**
- For blind-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		15-24	10-15	8-13	8-16	8-16	5-8		10-15						12-17				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	4	18	6	4.9	2.5	133868 0030	17,-
M 4	0.7	63	5.6	21	6	4.9	3.3	133868 0040	17,20
M 5	0.8	70	6.4	25	6	4.9	4.2	133868 0050	17,90
M 6	1	80	8	30	6	4.9	5	133868 0060	18,-
M 8	1.25	90	10	35	8	6.2	6.8	133868 0080	20,80
M 10	1.5	100	12	39	10	8	8.5	133868 0100	26,20
M 12	1.75	110	14	46	12	9	10.3	133868 0120	32,-
M 14	2	110	16	49	14	11	12	133868 0140	39,60
M 16	2	110	16	56	16	12	14	133868 0160	46,50

1128



## Machine tap S-POT, with Weldon clamping surface

M
60°
HSS-E
DIN 371
ISO 2 6H
B 4
2,5xD
DIN 1835 B
Vap.
i Vc/tz 407

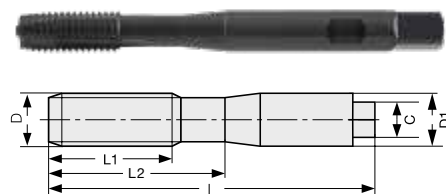
- **Metric ISO 6H thread**
- Straight-fluted with spiral point
- Form B, 4-thread chamfer
- Constructional dimensions DIN 371
- **Cutting material: HSS-E, vapour-treated**
- For through-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		15-24	10-15	8-13	8-16	8-16	5-8		10-15						12-17				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	4	18	6	4.9	2.5	133878 0030	15,90
M 4	0.7	63	5.6	21	6	4.9	3.3	133878 0040	16,10
M 5	0.8	70	6.4	25	6	4.9	4.2	133878 0050	16,80
M 6	1	80	8	30	6	4.9	5	133878 0060	16,90
M 8	1.25	90	10	35	8	6.2	6.8	133878 0080	19,30
M 10	1.5	100	12	39	10	8	8.5	133878 0100	24,20
M 12	1.75	110	14	46	12	9	10.3	133878 0120	29,80
M 14	2	110	16	49	14	11	12	133878 0140	37,-
M 16	2	110	16	56	16	12	14	133878 0160	43,20

1128



## SFT machine tap

M
60°
HSS-E V3
DIN 371
DIN 376
ISO 2 6H
C 2,5
40°
2,5xD
i Vc/tz
407

- ISO 6H metric thread
- 40°, spiral-fluted
- Type C, 2.5-thread chamfer
- For blind-hole threads
- **Cutting material: HSS-E V3**
- Also available with TIN coating on request

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
		5-20	5-15	5-10									20-40	10-25	10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### DIN 371

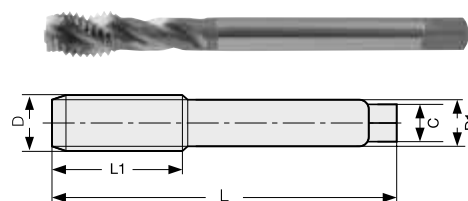
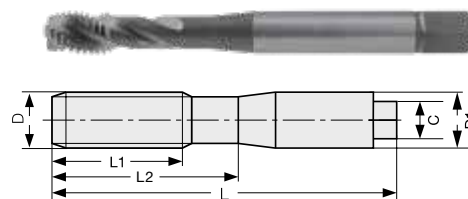
D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	133101 0020	16,70
M 2.5	0.45	50	9	-	2.8	2.1	2.10	133101 0025	15,80
M 3	0.5	56	5	18	3.5	2.7	2.50	133101 0030	13,20
M 3.5	0.6	56	6	20	4.0	3.0	2.90	133101 0035	14,40
M 4	0.7	63	7	21	4.5	3.4	3.30	133101 0040	13,70
M 5	0.8	70	8	25	6.0	4.9	4.20	133101 0050	13,70
M 6	1.0	80	10	30	6.0	4.9	5.00	133101 0060	13,70
M 8	1.25	90	13	35	8.0	6.2	6.80	133101 0080	14,40
M 10	1.5	100	15	39	10.0	8.0	8.50	133101 0100	16,90

1128

### DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	5	2.2	-	2.50	133105 0030	13,20
M 4	0.7	63	7	2.8	2.1	3.30	133105 0040	13,70
M 5	0.8	70	8	3.5	2.7	4.20	133105 0050	13,70
M 6	1.0	80	10	4.5	3.4	5.00	133105 0060	13,70
M 8	1.25	90	13	6.0	4.9	6.80	133105 0080	14,40
M 10	1.5	100	15	7.0	5.5	8.50	133105 0100	16,90
M 12	1.75	110	18	9.0	7.0	10.25	133105 0120	20,-
M 14	2.0	110	20	11.0	9.0	12.00	133105 0140	26,50
M 16	2.0	110	20	12.0	9.0	14.00	133105 0160	31,90
M 18	2.5	125	25	14.0	11.0	15.50	133105 0180	38,40
M 20	2.5	140	25	16.0	12.0	17.50	133105 0200	44,90
M 22	2.5	140	25	18.0	14.5	21.00	133105 0220	71,80
M 24	3.0	160	30	18.0	14.5	21.00	133105 0240	80,20
M 27	3.0	160	30	20.0	16.0	24.00	133105 0270	96,90
M 30	3.5	180	35	22.0	18.0	26.50	133105 0300	122,50

1128



**POT machine tap**

M
60°
HSS-E V3
DIN 371
DIN 376
ISO 2 6H
B 3,5-5
2,5xD
Vc/tz 407

- **ISO 6H metric thread**
- Straight-fluted with spiral point
- Type B, 3.5 to 5-thread chamfer
- For through-hole threads
- **Cutting material: HSS-E V3**
- Also available with TiN coating on request

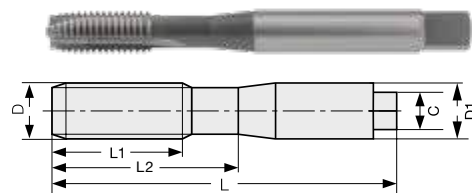
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 5-20	○ 5-15	○ 5-10									○ 20-40	● 10-25	○ 10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**DIN 371**

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	133001 0020	14,60
M 2.5	0.45	50	9	-	2.8	2.1	2.10	133001 0025	13,20
M 3	0.5	56	11	18	3.5	2.7	2.50	133001 0030	12,40
M 3.5	0.6	56	13	20	4.0	3.0	2.90	133001 0035	13,20
M 4	0.7	63	13	21	4.5	3.4	3.30	133001 0040	12,40
M 5	0.8	70	16	25	6.0	4.9	4.20	133001 0050	12,60
M 6	1.0	80	19	30	6.0	4.9	5.00	133001 0060	12,60
M 8	1.25	90	22	35	8.0	6.2	6.80	133001 0080	14,10
M 10	1.5	100	24	39	10.0	8.0	8.50	133001 0100	16,40

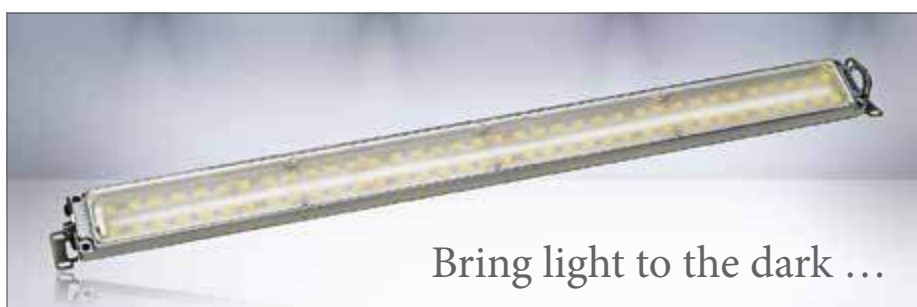
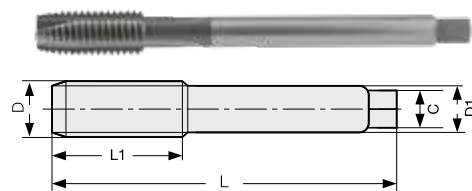
1128



**DIN 376**

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	11	2.2	-	2.50	133005 0030	12,40
M 4	0.7	63	13	2.8	2.1	3.30	133005 0040	12,40
M 5	0.8	70	16	3.5	2.7	4.20	133005 0050	12,60
M 6	1.0	80	19	4.5	3.4	5.00	133005 0060	12,60
M 8	1.25	90	22	6.0	4.9	6.80	133005 0080	14,10
M 10	1.5	100	24	7.0	5.5	8.50	133005 0100	16,40
M 12	1.75	110	29	9.0	7.0	10.25	133005 0120	19,10
M 14	2.0	110	30	11.0	9.0	12.00	133005 0140	24,60
M 16	2.0	110	32	12.0	9.0	14.00	133005 0160	30,50
M 18	2.5	125	34	14.0	11.0	15.50	133005 0180	36,-
M 20	2.5	140	34	16.0	12.0	17.50	133005 0200	43,10
M 22	2.5	140	34	18.0	14.5	19.50	133005 0220	68,90
M 24	3.0	160	38	18.0	14.5	21.00	133005 0240	76,50
M 27	3.0	160	38	20.0	16.0	24.00	133005 0270	92,20
M 30	3.5	180	45	22.0	18.0	26.50	133005 0300	117,30

1128



... with LED.

Bring light to the dark ...

**ATORN®**  
Performance demands quality

# CC-SFT machine tap

M
60°
HSS-E V3
DIN 371
DIN 376
ISO 2 6HX
C 2,5
45°
3xD
CrN
i Vc/fz 407

- **ISO 6HX metric thread**
- **For stainless steel, aluminium and steel**
- Controllable chips
- For better thread surfaces
- Low machining temperature
- Improved service life
- **For blind bore threads up to 3xD**
- 45°, spiral-fluted
- Type C, 2.5-thread chamfer
- **Material: HSS-E V3, CrN-coated**
- UNC, UNF and Whitworth thread taps available on request



Chips from a conventional tap    Chips from the CC-SFT



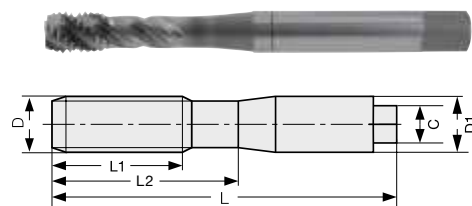
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		5-40	5-30		5-20	5-24	5-15	8-30	8-30				30-60	10-30	10-20				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## DIN 371

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.6	133106 0020	26,-
M 2.5	0.45	50	10	-	2.8	2.1	2.1	133106 0025	25,80
M 3	0.5	56	12	-	3.5	2.7	2.5	133106 0030	22,50
M 4	0.7	63	16	-	4.5	3.4	3.3	133106 0040	23,40
M 5	0.8	70	20	-	6.0	4.9	4.2	133106 0050	23,80
M 6	1.0	80	24	-	6.0	4.9	5.0	133106 0060	24,10
M 8	1.25	90	11	35	8.0	6.2	6.8	133106 0080	28,90
M 10	1.5	100	14	39	10.0	8.0	8.5	133106 0100	35,40

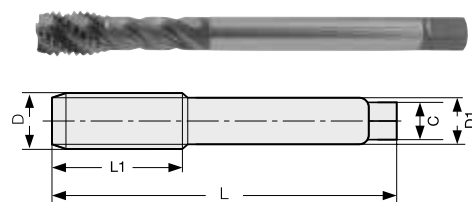
1128



## DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.75	110	16	9	7	10.3	133107 0120	44,10
M 14	2.0	110	18	11	9	12	133107 0140	52,30
M 16	2.0	110	18	12	9	14	133107 0160	61,60
M 18	2.5	125	23	14	11	15.5	133107 0180	83,-
M 20	2.5	140	23	16	12	17.5	133107 0200	98,10
M 24	3.0	160	27	18	14.5	21	133107 0240	131,80
M 30	3.5	180	32	22	18	26.5	133107 0300	253,40
M 36	4.0	200	36	28	22	32	133107 0360	364,10

1128



Multifunctional ...

... with indexable insert.

**ATORN®**  
Performance demands quality

# CC-POT machine tap

M
60°
HSS-E V3
HSS-E
DIN 371
DIN 376
ISO 2 6HX
B 4
2,5xD
CrN
Vc/tz 407

- **Metric ISO 6HX thread**
- **For stainless steel, aluminium and steel**
- Controllable chips
- For better thread surfaces
- Low machining temperature
- Improved service life
- **For through-hole threads**
- Straight-fluted
- 4-thread chamfer
- **Material: HSS-E V3, CrN-coated**
- UNC, UNF and Whitworth thread taps available on request

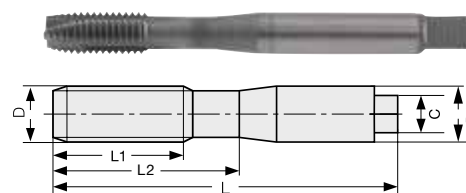
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	○		●	●	●	○	○				●	○	○			
		5-40	5-30		5-20	5-24	5-15	8-30	8-30				30-60	10-30	10-20			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## DIN 371

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.6	133040 0020	25,40
M 2.5	0.45	50	9	-	2.8	2.1	2.1	133040 0025	25,10
M 3	0.5	56	12	18	3.5	2.7	2.5	133040 0030	21,90
M 4	0.7	63	16	21	4.5	3.4	3.3	133040 0040	22,50
M 5	0.8	70	20	25	6.0	4.9	4.2	133040 0050	23,10
M 6	1.0	80	24	30	6.0	4.9	5.0	133040 0060	23,50
M 8	1.25	90	35	35	8.0	6.2	6.8	133040 0080	28,20
M 10	1.5	100	39	39	10.0	8.0	8.5	133040 0100	34,50

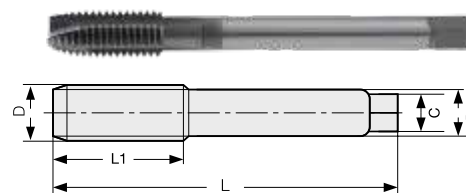
1128



## DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.75	110	28	9	7	10.3	133041 0120	43,-
M 14	2.0	110	30	11	9	12	133041 0140	50,90
M 16	2.0	110	32	12	9	14	133041 0160	59,60
M 18	2.5	125	34	14	11	15.5	133041 0180	80,70
M 20	2.5	140	34	16	12	17.5	133041 0200	95,50
M 24	3.0	160	38	18	14.5	21	133041 0240	127,70
M 30	3.5	180	45	22	18	26.5	133041 0300	246,-

1128



... 3 µm

**ATORN®**  
Performance demands quality



# VA-SFT machine tap

M
60°
HSS-E V3
DIN 371
DIN 376
ISO 2 6H
C 2,5
40°
2,5xD
Vap.
i Vc/fz 407

- ISO 6H metric thread
- 40°, spiral-fluted
- Type C, 2.5-thread chamfer
- For blind-hole threads

• **Cutting material: HSS-E V3, vapour-treated**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●		●	●	○				○		○		○					
		5-20	5-15		5-10	5-12	5-8				2-6		20-40		10-12					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## DIN 371

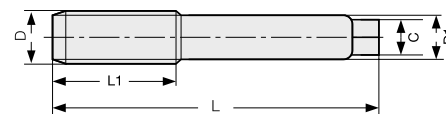
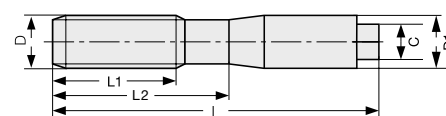
D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.6	133125 0020	17,20
M 2.2	0.45	45	9	-	2.8	2.1	1.7	133125 0022	18,90
M 2.5	0.45	50	9	-	2.8	2.1	2.1	133125 0025	18,70
M 3	0.5	56	5	18	3.5	2.7	2.5	133125 0030	16,30
M 3.5	0.6	56	6	20	4.0	3.0	2.9	133125 0035	17,-
M 4	0.7	63	7	21	4.5	3.4	3.3	133125 0040	16,50
M 5	0.8	70	8	25	6.0	4.9	4.2	133125 0050	17,10
M 6	1.0	80	10	30	6.0	4.9	5.0	133125 0060	17,20
M 8	1.25	90	13	35	8.0	6.2	6.8	133125 0080	19,90
M 10	1.5	100	15	39	10.0	8.0	8.5	133125 0100	24,90

1128

## DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	5	2.2	-	2.5	133135 0030	17,60
M 4	0.7	63	7	2.8	2.1	3.3	133135 0040	17,90
M 5	0.8	70	8	3.5	2.7	4.2	133135 0050	18,70
M 6	1.0	80	10	4.5	3.4	5.0	133135 0060	18,90
M 8	1.25	90	13	6.0	4.9	6.8	133135 0080	20,60
M 10	1.5	100	15	7.0	5.5	8.5	133135 0100	24,50
M 12	1.75	110	18	9.0	7	10.25	133135 0120	30,70
M 14	2.0	110	20	11.0	9	12.0	133135 0140	38,-
M 16	2.0	110	20	12.0	9	14.0	133135 0160	44,50
M 18	2.5	125	25	14.0	11	15.5	133135 0180	60,10
M 20	2.5	140	25	16.0	12.0	17.5	133135 0200	71,-
M 22	2.5	140	25	18.0	14.5	19.5	133135 0220	77,40
M 24	3.0	160	30	18.0	14.5	21.0	133135 0240	95,30
M 27	3.0	160	30	20.0	16.0	24.0	133135 0270	123,50
M 30	3.5	180	35	22.0	18.0	26.5	133135 0300	148,40
M 33	3.5	180	35	25.0	20	29.5	133135 0330	169,80
M 36	4.0	200	40	28.0	22	32.0	133135 0360	198,20

1128



# VA-POT machine tap

M
60°
HSS-E V3
DIN 371
DIN 376
ISO 2 6H
B 4
2,5xD
Vap.
i Vc/fz 407

- ISO 6H metric thread
- Straight-fluted with spiral point
- Type B, 4-thread chamfer
- For through-hole threads
- **Cutting material: HSS-E V3, vapour-treated**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●		●	●	○				○		○		○					
		5-20	5-15		5-10	5-12	5-8				2-6		20-40		10-12					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## DIN 371

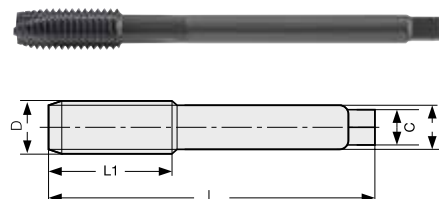
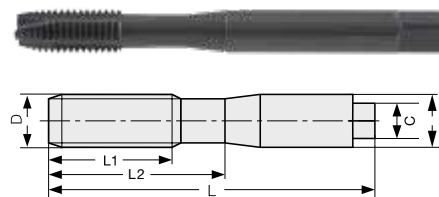
D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.6	133015 0020	17,20
M 2.2	0.45	45	9	-	2.8	2.1	1.7	133015 0022	17,10
M 2.5	0.45	50	9	-	2.8	2.1	2.1	133015 0025	17,-
M 3	0.5	56	11	18	3.5	2.7	2.5	133015 0030	15,20
M 3.5	0.6	56	11	20	4.0	3	2.9	133015 0035	16,-
M 4	0.7	63	13	21	4.5	3.4	3.3	133015 0040	15,40
M 5	0.8	70	16	25	6.0	4.9	4.2	133015 0050	16,10
M 6	1.0	80	19	30	6.0	4.9	5.0	133015 0060	16,30
M 8	1.25	90	22	35	8.0	6.2	6.8	133015 0080	18,60
M 10	1.5	100	24	39	10.0	8.0	8.5	133015 0100	23,20

1128

## DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	11	2.2	-	2.5	133025 0030	16,40
M 4	0.7	63	13	2.8	2.1	3.3	133025 0040	16,70
M 5	0.8	70	16	3.5	2.7	4.2	133025 0050	17,20
M 6	1.0	80	19	4.5	3.4	5.0	133025 0060	17,60
M 8	1.25	90	22	6.0	4.9	6.8	133025 0080	19,-
M 10	1.5	100	24	7.0	5.5	8.5	133025 0100	22,80
M 12	1.75	110	29	9.0	7.0	10.25	133025 0120	28,60
M 14	2.0	110	30	11.0	9.0	12.0	133025 0140	35,60
M 16	2.0	110	32	12.0	9.0	14.0	133025 0160	41,70
M 18	2.5	125	34	14.0	11.0	15.5	133025 0180	56,-
M 20	2.5	140	34	16.0	12.0	17.5	133025 0200	66,-
M 22	2.5	140	34	18.0	14.5	19.5	133025 0220	72,40
M 24	3.0	160	38	18.0	14.5	21.0	133025 0240	88,80
M 27	3.0	160	38	20.0	16.0	24.0	133025 0270	114,80
M 30	3.5	180	45	22.0	18.0	26.5	133025 0300	137,20
M 36	4.0	200	56	28.0	22.0	32.0	133025 0360	184,20

1128



## VA-SFT machine tap, tolerance 6G

M
60°
HSS-E V3
DIN 371
DIN 376
ISO 3 6G
C 2,5
40°
2,5xD
Vap.
i Vc/fz 407

- ISO 6G metric thread
- 40°, spiral-fluted
- Type C, 2.5-thread chamfer
- For blind-hole threads

• Cutting material: HSS-E V3, vapour-treated

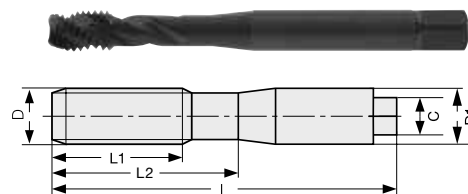
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		5-20	5-15		5-10	5-12	5-8				2-6		20-40		10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### DIN 371

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.6	133130 0020	21,10
M 2.5	0.45	50	9	-	2.8	2.1	2.1	133130 0025	22,30
M 3	0.5	56	5	18	3.5	2.7	2.5	133130 0030	19,50
M 4	0.7	63	7	21	4.5	3.4	3.3	133130 0040	19,90
M 5	0.8	70	8	25	6.0	4.9	4.2	133130 0050	20,90
M 6	1.0	80	10	30	6.0	4.9	5.0	133130 0060	21,-
M 8	1.25	90	13	35	8.0	6.2	6.8	133130 0080	24,-
M 10	1.5	100	15	39	10.0	8	8.5	133130 0100	30,-

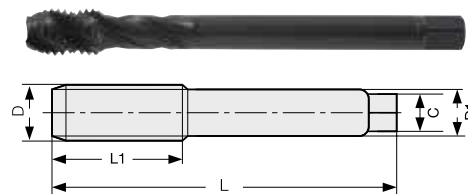
1128



### DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.75	110	18	9	7	10.25	133140 0120	36,90
M 14	2.0	110	20	11	9	12.0	133140 0140	45,50
M 16	2.0	110	20	12	9	14.0	133140 0160	53,40

1128



## VA-POT machine tap, tolerance 6G

M
60°
HSS-E V3
DIN 371
DIN 376
ISO 3 6G
B 4
40°
2,5xD
Vap.
i Vc/fz 407

- ISO 6G metric thread
- Straight-fluted with spiral point
- Type B, 4-thread chamfer
- For through-hole threads

• Cutting material: HSS-E V3, vapour-treated

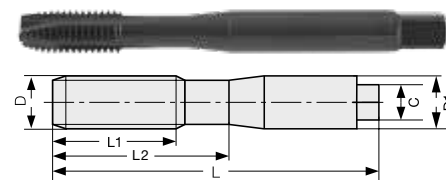
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		5-20	5-15		5-10	5-12	5-8				2-6		20-40		10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### DIN 371

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.6	133020 0020	21,10
M 2.5	0.45	50	9	-	2.8	2.1	2.1	133020 0025	20,90
M 3	0.5	56	11	18	3.5	2.7	2.5	133020 0030	18,10
M 4	0.7	63	13	21	4.5	3.4	3.3	133020 0040	18,60
M 5	0.8	70	16	25	6.0	4.9	4.2	133020 0050	19,30
M 6	1.0	80	19	30	6.0	4.9	5.0	133020 0060	19,40
M 8	1.25	90	22	35	8.0	6.2	6.8	133020 0080	22,10
M 10	1.5	100	24	39	10.0	8.0	8.5	133020 0100	28,-

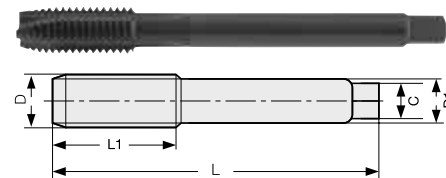
1128



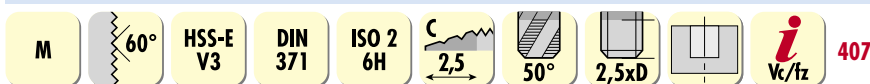
### DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.75	110	29	9.0	7.0	10.25	133030 0120	34,50
M 14	2.0	110	30	11.0	9.0	12.0	133030 0140	42,70
M 16	2.0	110	32	12.0	9.0	14.0	133030 0160	49,90

1128



## AL-SFT machine tap



- ISO 6H metric thread
- 50°, spiral-fluted with spiral point
- Type C, 2.5-thread chamfer
- For blind-hole threads
- Cutting material: HSS-E V3

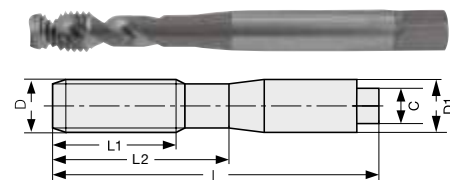
**For aluminium**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		ERP/CFP/thermo.	< 55 HRc	< 60 HRc
												●	●	●				
												20-40	10-25	10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 1.6	0.35	40	8	-	2.5	2.1	1.25	133145 0016	20,-
M 2	0.4	45	8	-	2.8	2.1	1.6	133145 0020	17,-
M 2.2	0.45	45	9	-	2.8	2.1	1.7	133145 0022	17,-
M 2.5	0.45	50	9	-	2.8	2.1	2.1	133145 0025	16,90
M 3	0.5	56	5	18	3.5	2.7	2.5	133145 0030	14,70
M 3.5	0.6	56	6	20	4.0	3.0	2.9	133145 0035	15,90
M 4	0.7	63	7	21	4.5	3.4	3.3	133145 0040	15,20
M 5	0.8	70	8	25	6.0	4.9	4.2	133145 0050	15,80
M 6	1.0	80	10	30	6.0	4.9	5.0	133145 0060	15,90
M 8	1.25	90	13	35	8.0	6.2	6.8	133145 0080	17,90
M 10	1.5	100	15	39	10.0	8.0	8.5	133145 0100	21,80

1128



## AL-POT machine tap



- ISO 6H metric thread
- Straight-fluted with spiral point
- Type B, 4-thread chamfer
- For through-hole threads
- Cutting material: HSS-E V3

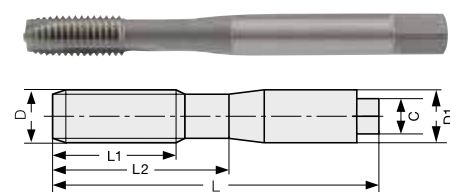
**For aluminium**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		ERP/CFP/thermo.	< 55 HRc	< 60 HRc
												●	●	●				
												20-40	10-25	10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	C mm	D1 mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.1	2.8	1.6	133035 0020	16,30
M 2.5	0.45	50	9	-	2.1	2.8	2.1	133035 0025	16,20
M 3	0.5	56	11	18	2.7	3.5	2.5	133035 0030	14,20
M 4	0.7	63	13	21	3.4	4.5	3.3	133035 0040	14,60
M 5	0.8	70	16	25	4.9	6	4.2	133035 0050	15,10
M 6	1.0	80	19	30	4.9	6	5.0	133035 0060	15,20
M 8	1.25	90	22	35	6.2	8	6.8	133035 0080	17,40
M 10	1.5	100	24	39	8	10	8.5	133035 0100	21,-

1128



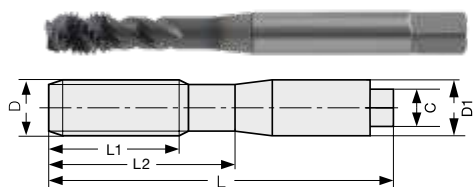
## Synchronised machine tap Z-SFT

M 60° PM DIN 371 DIN 376 ISO 2 6H Synchro C 2,5 50° 2,5xD TiCN Vc/tz 407

- ISO 6H metric thread
- 50°, spiral-fluted
- Type C, 2.5-thread chamfer
- For blind-hole threads
- Coolant bore version available on request
- **Cutting material: PM powder (Co5 + V5), TiCN-coated (V)**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		5-40	5-30	5-20	5-20	5-24	5-15			5-10			30-60	10-30	10-20				

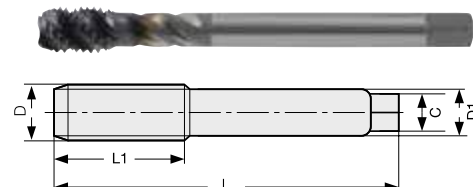
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



DIN 371

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	5	18	3.5	2.7	2.5	133155 0030	29,-
M 4	0.7	63	7	21	4.5	3.4	3.3	133155 0040	30,60
M 5	0.8	70	8	25	6.0	4.9	4.2	133155 0050	31,30
M 6	1.0	80	10	30	6.0	4.9	5.0	133155 0060	31,50
M 8	1.25	90	13	35	8.0	6.2	6.75	133155 0080	37,40
M 10	1.5	100	15	39	10.0	8.0	8.5	133155 0100	43,90

1128



DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.75	110	18	9	7	10.25	133160 0120	55,30
M 14	2.0	110	20	11	9	12.0	133160 0140	69,40
M 16	2.0	110	20	12	9	14.0	133160 0160	79,90
M 18	2.5	125	25	14	11	15.5	133160 0180	102,70
M 20	2.5	140	25	16	12	17.5	133160 0200	115,70
M 24	3.0	160	30	18	14.5	21	133160 0240	193,80
M 30	3.5	180	35	22	18	26.5	133160 0300	295,40

1128

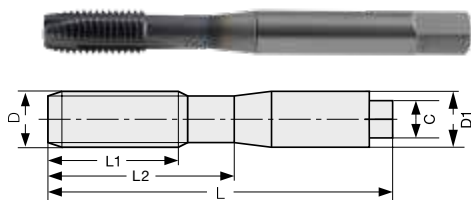
## Synchronised machine tap Z-POT

M 60° PM DIN 371 DIN 376 ISO 2 6HX Synchro B 4 2,5xD TiCN Vc/tz 407

- ISO 6HX metric thread
- Straight-fluted with spiral point
- Type B, 4-thread chamfer
- For through-hole threads
- Coolant bore version available on request
- **Cutting material: PM powder (Co5 + V5), TiCN-coated (V)**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		5-40	5-30	5-20	5-20	5-24	5-15			5-15			30-60	10-30	10-20				

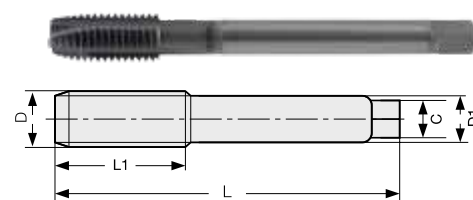
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



DIN 371

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.6	133045 0020	35,80
M 2.5	0.45	50	9	-	2.8	2.1	2.1	133045 0025	35,70
M 3	0.5	56	11	18	3.5	2.7	2.5	133045 0030	28,40
M 4	0.7	63	13	21	4.5	3.4	3.3	133045 0040	30,20
M 5	0.8	70	16	25	6.0	4.9	4.2	133045 0050	30,60
M 6	1.0	80	19	30	6.0	4.9	5.0	133045 0060	31,10
M 8	1.25	90	22	35	8.0	6.2	6.75	133045 0080	36,50
M 10	1.5	100	24	39	10.0	8.0	8.5	133045 0100	42,90

1128



DIN 376

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.75	110	29	9	7	10.25	133050 0120	54,50
M 14	2.0	110	30	11	9	12.0	133050 0140	68,60
M 16	2.0	110	32	12	9	14.0	133050 0160	78,50
M 18	2.5	125	34	14	11	15.5	133050 0180	100,80
M 20	2.5	140	34	16	12	17.5	133050 0200	113,10

1128

## V-XPM-HT machine tap

M
60°
XPM
Werks-norm
ISO 2 6HX
C 2,5
1,5xD
TiCN
i Vc/tz
407

- ISO 6HX metric thread
- Straight-fluted
- Type C, 2.5-thread chamfer
- For blind-hole and through-hole threads
- **Cutting material: XPM powder (Co10 + V5), TiCN-coated (V)**

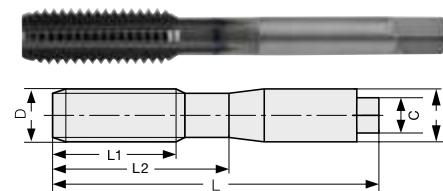
**Hard machining < 55 HRC**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si			< 55 HRC	< 60 HRC	≥ 60 HRC
		● 5-40	● 5-30	● 5-20													● 2-12		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	46	11	19	3.5	2.7	2.5	133255 0030	28,-
M 4	0.7	52	13	21	4.5	3.4	3.3	133255 0040	28,10
M 5	0.8	60	16	24	6.0	4.9	4.2	133255 0050	28,70
M 6	1.0	62	19	29	6.0	4.9	5.0	133255 0060	29,10
M 8	1.25	70	22	-	6.0	4.9	6.8	133255 0080	32,60
M 10	1.5	75	24	-	7.0	5.5	8.5	133255 0100	38,20
M 12	1.75	82	29	-	9.0	7.0	10.25	133255 0120	50,10

1128



## VX-OT machine tap

M
60°
VHM
Werks-norm
ISO 2 6HX
C 2,5
1,5xD
TiCN
i Vc/tz
407

- ISO 6HX metric thread
- Straight-fluted with spiral point
- Type C, 2.5-thread chamfer
- For blind-hole and through-hole threads
- **Cutting material: superfine grain solid carbide, TiCN-coated (V)**

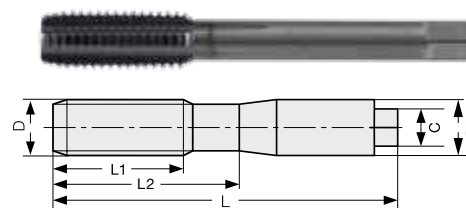
**Hard machining ≥ 60 HRC**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si			< 55 HRC	< 60 HRC	≥ 60 HRC
																	● 2-6	● 1-3	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

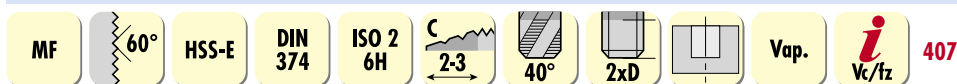
D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	46	11	19	3.5	2.7	2.5	133250 0030	104,60
M 4	0.7	52	13	21	4.5	3.4	3.3	133250 0040	109,10
M 5	0.8	60	16	24	6.0	4.9	4.2	133250 0050	113,40
M 6	1.0	62	19	29	6.0	4.9	5.0	133250 0060	123,70
M 8	1.25	70	22	-	6.0	4.9	6.8	133250 0080	152,30
M 10	1.5	75	24	-	7.0	5.5	8.5	133250 0100	204,60
M 12	1.75	82	29	-	9.0	7.0	10.25	133250 0120	265,90

1128





## ATORN® Universal machine taps

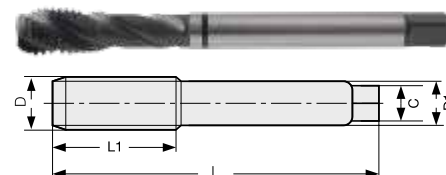


- **Metric ISO 6H fine thread**
- 40° spiral-fluted
- Form C, 2-3 thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For blind-hole threads

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		5-15	5-15		4-6	4-6			5-8				10-15		10-15				

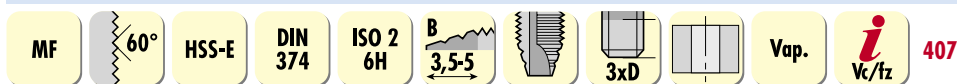
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 8	1	90	22	6	4.9	7.00	134760 0810	17,80
M 10	1	90	20	7	5.5	9.00	134760 1010	22,50
M 10	1.25	100	24	7	5.5	8.80	134760 1012	22,90
M 12	1	100	22	9	7	11.00	134760 1210	27,50
M 12	1.25	100	22	9	7	10.80	134760 1212	27,50
M 12	1.5	100	22	9	7	10.50	134760 1215	28,30
M 14	1	100	22	11	9	13.00	134760 1410	41,20
M 14	1.5	100	22	11	9	12.50	134760 1415	42,60
M 16	1	100	22	12	9	15.00	134760 1610	50,20
M 16	1.5	100	22	12	9	14.50	134760 1615	49,40
M 18	1.5	110	25	14	11	16.50	134760 1815	64,10
M 18	2	125	34	14	11	16.00	134760 1820	68,70
M 20	1	125	25	16	12	19.00	134760 2010	78,40
M 20	1.5	125	25	16	12	18.50	134760 2015	81,40



1127

## ATORN® Universal machine taps

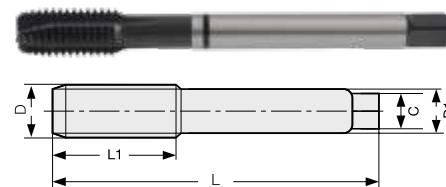


- **Metric ISO 6H fine thread**
- Straight-fluted with spiral point
- Type B, 3.5 to 5-thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For through-hole threads
- The spiral point ensures strong chip removal to the front
- Possible thread depth 3 x D

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		5-15	5-15		4-6	4-6			5-8				10-15		10-15				

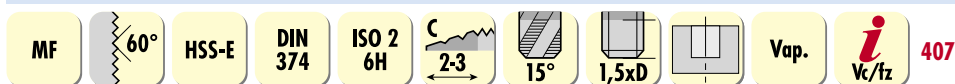
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 8	1	90	22	6	4.9	7.00	134765 0810	17,40
M 10	1	90	20	7	5.5	9.00	134765 1010	22,10
M 10	1.25	100	24	7	5.5	8.80	134765 1012	22,50
M 12	1	100	22	9	7	11.00	134765 1210	26,90
M 12	1.25	100	22	9	7	10.80	134765 1212	26,90
M 12	1.5	100	22	9	7	10.50	134765 1215	27,70
M 14	1	100	22	11	9	13.00	134765 1410	40,10
M 14	1.5	100	22	11	9	12.50	134765 1415	41,70
M 16	1	100	22	12	9	15.00	134765 1610	49,-
M 16	1.5	100	22	12	9	14.50	134765 1615	48,40
M 18	1.5	110	25	14	11	16.50	134765 1815	62,10
M 18	2	125	34	14	11	16.00	134765 1820	66,20
M 20	1	125	25	16	12	19.00	134765 2010	76,30
M 20	1.5	125	25	16	12	18.50	134765 2015	80,40

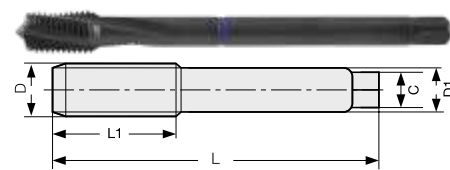


1127

## ATORN® Machine tap, weak-spiralled



- ISO 6H fine-pitch metric thread
- 15° RH, spiral-fluted
- Type C, 2-3 thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For blind-hole threads
- Easy chip removal to the rear
- Possible thread depth 1.5xD



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

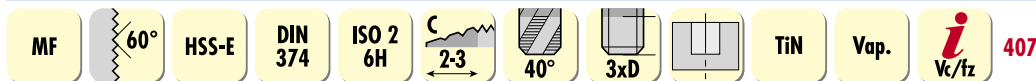
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 5	0.5	70	5	3.5	2.7	4.50	135280 0505	32,-
M 6	0.75	80	8	4.5	3.4	5.20	135280 0607	24,50
M 8	0.75	80	8	6.0	4.9	7.20	135280 0807	28,40
M 8	1	90	11	6.0	4.9	7.00	135280 0810	22,70
M 10	1	90	11	7.0	5.5	9.00	135280 1010	26,10
M 10	1.25	100	14	7.0	5.5	8.80	135280 1012	27,60
M 12	1	100	11	9.0	7.0	11.00	135280 1210	45,70
M 12	1.25	100	16	9.0	7.0	10.80	135280 1212	40,30
M 12	1.5	100	16	9.0	7.0	10.50	135280 1215	44,90
M 14	1	100	11	11.0	9.0	13.00	135280 1410	59,50
M 14	1.5	100	15	11.0	9.0	12.50	135280 1415	58,50
M 16	1	100	11	12.0	9.0	15.00	135280 1610	57,50

1127

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 16	1.5	100	15	12.0	9.0	14.50	135280 1615	57,50
M 18	1.5	110	16	14.0	11.0	16.50	135280 1815	71,20
M 20	1.5	125	16	16.0	12.0	18.50	135280 2015	80,90
M 22	1.5	125	16	18.0	14.5	20.50	135280 2215	85,-
M 24	1.5	140	16	18.0	14.5	22.50	135280 2415	92,60
M 24	2	140	22	18.0	14.5	22.00	135280 2420	106,-
M 26	1.5	140	20	18.0	14.5	24.50	135280 2615	118,-
M 27	1.5	140	20	20.0	16.0	25.50	135280 2715	129,50
M 27	2	140	28	20.0	16.0	25.00	135280 2720	142,50
M 28	1.5	140	20	20.0	16.0	26.50	135280 2815	168,-
M 30	1.5	150	20	22.0	18.0	28.50	135280 3015	170,-
M 30	2	150	20	22.0	18.0	28.00	135280 3020	187,50

1127

## ATORN® Machine tap



- ISO 6H fine-pitch metric thread
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- **Cutting material: HSS-E, vapour-treated; HSS-E, TiN-coated**
- For blind-hole threads
- Strong chip removal to the rear
- Minimal thread relief grinding
- Possible thread depth 3 x D

Up to 1000 N/mm²

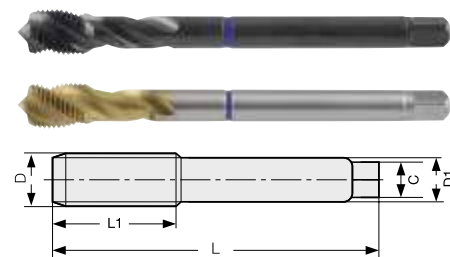
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
135285....		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20										
135290....		● 5-40	● 5-30		○ 5-20	○ 5-24			○ 8-30										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

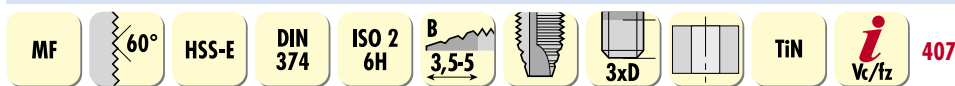
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	Vapour-treated art.no.	€	TiN art.no.	€
M 6	0.75	80	8	4.5	3.4	5.20	135285 0607	36,90	135290 0607	25,70
M 8	1	90	11	6	4.9	7.00	135285 0810	27,40	135290 0810	34,20
M 10	1	90	11	7	5.5	9.00	135285 1010	30,80	135290 1010	37,80
M 10	1.25	100	14	7	5.5	8.80	135285 1012	33,90	135290 1012	41,-
M 12	1.25	100	16	9	7	10.80	135285 1212	54,50	135290 1212	65,60
M 12	1.5	100	16	9	7	10.50	135285 1215	47,-	135290 1215	58,50
M 14	1.5	100	15	11	9	12.50	135285 1415	60,10	135290 1415	71,20
M 16	1.5	100	15	12	9	14.50	135285 1615	61,60	135290 1615	73,30
M 18	1.5	110	16	14	11	16.50	135285 1815	78,40	135290 1815	92,60
M 20	1.5	125	16	16	12	18.50	135285 2015	95,60	135290 2015	111,-

1127

1127



# ATORN® Machine tap



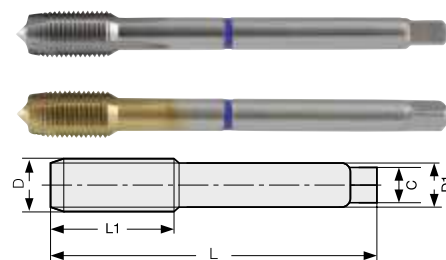
- **Metric ISO 6H fine thread**
- Straight-fluted with spiral point, Form B, 3.5 to 5-thread chamfer
- **Cutting material: HSS-E; HSS-E, TiN-coated**
- For through-hole threads
- The spiral point ensures strong chip removal to the front

**Up to 1000 N/mm<sup>2</sup>**

material	● very well suited ○ well suited	steel			stainless steel		cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium	copper	graphite	hardened steel				
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
135255....	●	●	●		○	○		○										
135260....	●	●	●		○	○		○										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

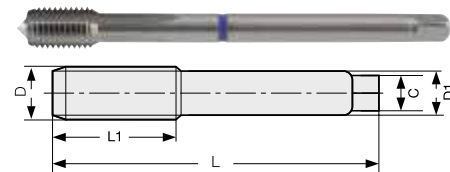
D	Pitch	L	L1	D1	C	Tapping hole Ø	art.no.	€	TiN	art.no.	€
M 3	0.35	56	7	2.2	-	2.65	135255 0335	30,90	135260 0305	38,10	
M 4	0.5	63	8	2.8	2.1	3.50	135255 0405	20,90	135260 0405	28,30	
M 5	0.5	70	10	3.5	2.7	4.50	135255 0505	21,10	135260 0505	28,50	
M 6	0.5	80	13	4.5	3.4	5.50	135255 0605	21,10	135260 0605	28,50	
M 6	0.75	80	13	4.5	3.4	5.20	135255 0607	21,10	135260 0607	28,50	
M 7	0.75	80	13	5.5	4.3	6.20	135255 0675	31,10	135260 0675	38,50	
M 8	0.5	80	14	6	4.9	7.50	135255 0805	28,40	135260 0805	36,-	
M 8	0.75	80	14	6	4.9	7.20	135255 0807	24,80	135260 0807	32,10	
M 8	1	90	17	6	4.9	7.00	135255 0810	22,70	135260 0810	30,40	
M 9	1	90	17	7	5.5	8.00	135255 0910	38,80	135260 0910	46,30	
M 10	0.75	90	17	7	5.5	9.20	135255 1007	34,30	135260 1007	41,70	
M 10	1	90	17	7	5.5	9.00	135255 1010	26,20	135260 1010	34,-	
M 10	1.25	100	20	7	5.5	8.80	135255 1012	27,80	135260 1012	39,40	
M 11	1	90	20	8	6.2	10.00	135255 1110	46,30	135260 1110	58,-	
M 12	1	100	20	9	7	11.00	135255 1210	30,90	135260 1210	42,60	
M 12	1.25	100	20	9	7	10.80	135255 1212	32,50	135260 1212	44,30	
M 12	1.5	100	20	9	7	10.50	135255 1215	29,50	135260 1215	41,20	
M 14	1	100	20	11	9	13.00	135255 1410	38,10	135260 1410	50,40	
M 14	1.25	100	20	11	9	12.80	135255 1412	39,60	135260 1412	51,40	
M 14	1.5	100	20	11	9	12.50	135255 1415	35,70	135260 1415	48,-	
M 15	1	100	20	12	9	14.00	135255 1510	57,-	135260 1510	68,20	
M 15	1.5	100	20	12	9	13.50	135255 1515	58,-	135260 1515	69,70	
M 16	1	100	22	12	9	15.00	135255 1610	49,50	135260 1610	62,10	
M 16	1.5	100	22	12	9	14.50	135255 1615	45,90	135260 1615	58,50	
M 18	1	110	25	14	11	17.00	135255 1810	66,20	135260 1810	82,90	
M 18	1.5	110	25	14	11	16.50	135255 1815	61,10	135260 1815	76,30	
M 18	2	125	30	14	11	16.00	135255 1820	76,80	135260 1820	91,60	
M 20	1	125	25	16	12	19.00	135255 2010	81,90	135260 2010	97,20	
M 20	1.5	125	25	16	12	18.50	135255 2015	67,20	135260 2015	84,50	
M 20	2	140	32	16	12	18.00	135255 2020	88,50	135260 2020	103,-	
M 22	1	125	25	18	14.5	21.00	135255 2210	96,20	135260 2210	112,-	
M 22	1.5	125	25	18	14.5	20.50	135255 2215	79,90	135260 2215	94,60	
M 22	2	140	32	18	14.5	20.00	135255 2220	96,20	135260 2220	112,-	
M 24	1	140	28	18	14.5	23.00	135255 2410	112,-	135260 2410	125,50	
M 24	1.5	140	28	18	14.5	22.50	135255 2415	89,50	135260 2415	105,-	
M 24	2	140	28	18	14.5	22.00	135255 2420	92,60	135260 2420	110,-	
M 26	1.5	140	28	18	14.5	24.50	135255 2615	112,-	135260 2615	125,50	
M 27	1.5	140	28	20	16	25.50	135255 2715	126,50	135260 2715	155,-	
M 27	2	140	28	20	16	25.00	135255 2720	130,50	135260 2720	159,-	
M 30	1.5	150	28	22	18	28.50	135255 3015	137,50	135260 3015	169,-	
M 30	2	150	28	22	18	28.00	135255 3020	145,50	135260 3020	177,-	
M 32	1.5	150	28	22	18	30.50	135255 3215	166,-	135260 3215	196,50	
M 33	1.5	160	28	25	20	31.50	135255 3315	197,50	135260 3315	214,-	
M 35	1.5	170	30	28	22	33.50	135255 3515	219,-	135260 3515	250,-	
M 36	1.5	170	30	28	22	34.50	135255 3615	198,50	135260 3615	245,-	
M 38	1.5	170	30	28	22	36.50	135255 3815	250,-	135260 3815	285,-	
M 40	1.5	170	30	32	24	38.50	135255 4015	275,-	135260 4015	311,-	



## ATORN® Machine tap, without spiral point

MF
60°
HSS-E
DIN 374
ISO 2 6H
C 2-3
1,5xD
Vc/fz 407

- ISO 6H fine-pitch metric thread
- Straight-fluted
- Type C, 2-3 thread chamfer
- **Cutting material: HSS-E**
- For blind-hole and through-hole threads
- Possible thread depth 1.5xD



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8 % Si	≥8 % Si		GRP/CFP/thermo	<55 HRc	<60 HRc	≥60 HRc
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.35	56	4	2.2	2.1	2.65	135265 0303	38,30
M 4	0.5	63	5	2.8	2.1	3.50	135265 0405	29,50
M 5	0.5	70	5	3.5	2.7	4.50	135265 0505	24,30
M 6	0.5	80	5	4.5	3.4	5.50	135265 0605	24,70
M 6	0.75	80	8	4.5	3.4	5.20	135265 0607	22,-
M 8	0.5	80	8	6	4.9	7.50	135265 0805	31,30
M 8	0.75	80	8	6	4.9	7.20	135265 0807	24,40
M 8	1	90	11	6	4.9	7.00	135265 0810	24,40
M 9	1	90	11	7	5.5	8.00	135265 0910	27,80
M 10	0.75	90	11	7	5.5	9.20	135265 1075	25,40
M 10	1	90	11	7	5.5	9.00	135265 1010	25,60
M 10	1.25	100	14	7	5.5	8.80	135265 1012	24,60
M 12	1	100	11	9	7	11.00	135265 1210	34,-
M 12	1.25	100	16	9	7	10.80	135265 1212	32,60
M 12	1.5	100	16	9	7	10.50	135265 1215	31,80
M 14	1	100	11	11	9	13.00	135265 1410	41,60
M 14	1.25	100	15	11	9	12.80	135265 1412	48,20
M 14	1.5	100	15	11	9	12.50	135265 1415	38,30

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 15	1	100	11	12	9	14.00	135265 1510	57,-
M 16	1	100	11	12	9	15.00	135265 1610	50,20
M 16	1.5	100	15	12	9	14.50	135265 1615	46,-
M 18	1	110	12	14	11	17.00	135265 1810	58,50
M 18	1.5	110	16	14	11	16.50	135265 1815	56,-
M 20	1	125	12	16	12	19.00	135265 2010	83,40
M 20	2	140	20	16	12	18.00	135265 2020	101,50
M 22	1.5	125	16	18	14.5	20.50	135265 2215	79,40
M 24	1	140	15	18	14.5	23.00	135265 2410	131,50
M 24	1.5	140	16	18	14.5	22.50	135265 2415	96,20
M 24	2	140	22	18	14.5	22.00	135265 2420	107,-
M 26	1.5	140	20	18	14.5	24.50	135265 2615	121,50
M 27	1.5	140	20	20	16	25.50	135265 2715	134,50
M 27	2	140	28	20	16	25.00	135265 2720	134,50
M 30	1.5	150	20	22	18	28.50	135265 3015	137,50
M 30	2	150	20	22	18	28.00	135265 3020	137,50
M 36	1.5	170	25	28	22	34.50	135265 3615	209,-

1127

1127

# Machine tap

Page 231



## A-SFT machine tap

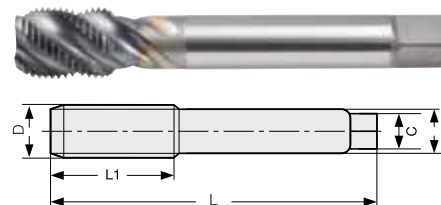
MF 60° HSS-E PM DIN 374 ISO 2 6HX C 2,5 45° 2xD TiCN Vc/tz 407

- ISO 2 6HX fine-pitch metric thread
- 45°, spiral-fluted
- Type C, 2.5-thread chamfer
- Constructional dimensions DIN 374
- **Cutting material: HSS-E-PM, TiCN-coated**
- For blind-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc
		15-60	10-60	8-30	8-20	8-20				5-10			15-35	15-35	15-35			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 6	0.75	80	8	4.5	3.4	5.2	133420 0675	37,20
M 8	0.75	80	8	6	4.9	7.2	133420 0875	39,20
M 8	1.0	90	10	6	4.9	7	133420 0810	41,50
M 10	1.0	90	10	7	5.5	9	133420 1010	43,70
M 10	1.25	100	12	7	5.5	8.8	133420 1012	42,80
M 12	1.0	100	12	9	7	11	133420 1210	50,10
M 12	1.25	100	12	9	7	10.8	133420 1212	50,10
M 12	1.5	100	14	9	7	10.5	133420 1215	52,20
M 14	1.5	100	16	11	9	12.5	133420 1415	64,60
M 16	1.5	100	16	12	9	14.5	133420 1615	74,80
M 18	1.5	110	16	14	11	16.5	133420 1815	86,20
M 20	1.5	125	16	16	12	18.5	133420 2015	108,-
M 22	1.5	125	16	18	14.5	20.5	133420 2215	112,-
M 24	1.5	140	16	18	14.5	22.5	133420 2415	147,-



1128

## A-POT machine tap

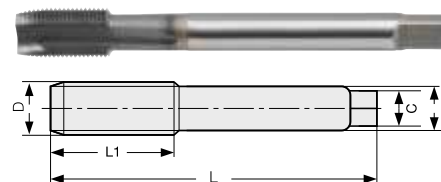
MF 60° HSS-E PM DIN 374 ISO 2 6HX B 4 2,5xD TiCN Vc/tz 407

- Metric ISO 2 6HX fine thread
- Straight-fluted with spiral point
- Form B, 4-thread chamfer
- Constructional dimensions DIN 374
- **Cutting material: HSS-E-PM, TiCN-coated**
- For through-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc
		15-60	10-60	8-30	8-20	8-20				5-10			15-35	15-35	15-35			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 6	0.75	80	14	4.5	3.4	5.2	133460 0675	36,10
M 8	0.75	80	18	6	4.9	7.2	133460 0875	38,10
M 8	1.0	90	22	6	4.9	7	133460 0810	40,30
M 10	1.0	90	20	7	5.5	9	133460 1010	42,30
M 10	1.25	100	24	7	5.5	8.8	133460 1012	41,60
M 12	1.0	100	22	9	7	11	133460 1210	48,70
M 12	1.25	100	22	9	7	10.8	133460 1212	48,70
M 12	1.5	100	22	9	7	10.5	133460 1215	50,80
M 14	1.5	100	22	11	9	12.5	133460 1415	62,80
M 16	1.5	100	22	12	9	14.5	133460 1615	72,60
M 18	1.5	110	25	14	11	16.5	133460 1815	83,80
M 20	1.5	125	25	16	12	18.5	133460 2015	105,-
M 22	1.5	125	25	18	14.5	20.5	133460 2215	108,50
M 24	1.5	140	28	18	14.5	22.5	133460 2415	142,70

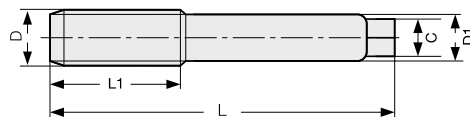


1128

## S-SFT machine tap

MF 60° HSS-E DIN 374 ISO 2 6H C 2,5 40° 2,5xD Vap. Vc/tz 407

- Metric ISO 6H fine thread
- 40°, spiral-fluted
- Form C, 2.5-thread chamfer
- Cutting material: HSS-E, vapour-treated
- For blind-hole threads



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-24	10-15	8-13	8-16	8-16	5-8		10-15					12-17				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.35	56	4	2.2	-	2.65	133965 0303	23,60
M 4	0.5	63	5.6	2.8	2.1	3.5	133965 0405	23,60
M 5	0.5	70	6.4	3.5	2.7	4.5	133965 0505	24,40
M 6	0.5	80	8	4.5	3.4	5.5	133965 0605	24,40
M 6	0.75	80	8	4.5	3.4	5.2	133965 0607	23,70
M 8	0.75	80	10	6	4.9	7.2	133965 0807	25,-
M 8	1	90	10	6	4.9	7	133965 0810	25,10
M 9	1	90	10	7	5.5	8	133965 0910	31,-
M 10	0.75	90	12	7	5.5	9.2	133965 1007	28,50
M 10	1	90	12	7	5.5	9	133965 1010	27,30
M 10	1.25	100	12	7	5.5	8.8	133965 1012	27,30
M 11	1	90	12	8	6.2	10	133965 1110	54,60
M 12	1	100	14	9	7	11	133965 1210	31,80
M 12	1.25	100	14	9	7	10.8	133965 1212	31,80
M 12	1.5	100	14	9	7	10.5	133965 1215	31,80
M 14	1	100	16	11	9	13	133965 1410	48,70

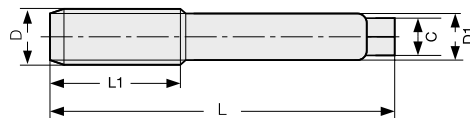
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 14	1.25	100	16	11	9	12.8	133965 1412	48,70
M 14	1.5	100	16	11	9	12.5	133965 1415	41,30
M 16	1	100	16	12	9	15	133965 1610	50,50
M 16	1.5	100	16	12	9	14.5	133965 1615	47,50
M 18	1	110	20	14	11	17	133965 1810	64,40
M 18	1.5	110	20	14	11	16.5	133965 1815	54,60
M 20	1	125	20	16	12	19	133965 2010	80,60
M 20	1.5	125	20	16	12	18.5	133965 2015	68,30
M 20	2	140	20	16	12	18	133965 2020	64,40
M 22	1	125	20	18	14.5	21	133965 2210	92,-
M 22	1.5	125	20	18	14.5	20.5	133965 2215	73,70
M 22	2	140	20	18	14.5	20	133965 2220	80,60
M 24	1	140	20	18	14.5	23	133965 2410	107,90
M 24	1.5	140	24	18	14.5	22.5	133965 2415	92,30
M 24	2	140	24	18	14.5	22	133965 2420	92,-

1128

## S-POT machine tap

MF 60° HSS-E DIN 374 ISO 2 6H B 4 2,5xD Vap. Vc/tz 407

- Metric ISO 6H fine thread
- Straight-fluted with spiral point
- Form B, 4-thread chamfer
- Cutting material: HSS-E, vapour-treated
- For through-hole threads



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-24	10-15	8-13	8-16	8-16	5-8		10-15					12-17				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.35	56	9	2.2	-	2.65	133975 0303	21,90
M 4	0.5	63	10	2.8	2.1	3.5	133975 0405	21,90
M 5	0.5	70	12	3.5	2.7	4.5	133975 0505	22,60
M 6	0.5	80	14	4.5	3.4	5.5	133975 0605	22,10
M 6	0.75	80	14	4.5	3.4	5.2	133975 0607	23,50
M 8	0.75	80	18	6	4.9	7.2	133975 0807	23,40
M 8	1	90	22	6	4.9	7	133975 0810	25,10
M 9	1	90	22	7	5.5	8	133975 0910	29,50
M 10	0.75	90	20	7	5.5	9.2	133975 1007	37,40
M 10	1	90	20	7	5.5	9	133975 1010	35,30
M 10	1.25	100	24	7	5.5	8.8	133975 1012	31,-
M 11	1	90	20	8	6.2	10	133975 1110	51,90
M 12	1	100	22	9	7	11	133975 1210	29,80
M 12	1.25	100	22	9	7	10.8	133975 1212	29,80
M 12	1.5	100	22	9	7	10.5	133975 1215	29,80
M 14	1	100	22	11	9	13	133975 1410	52,40

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 14	1.25	100	22	11	9	12.8	133975 1412	52,40
M 14	1.5	100	22	11	9	12.5	133975 1415	44,-
M 16	1	100	22	12	9	15	133975 1610	54,90
M 16	1.5	100	22	12	9	14.5	133975 1615	50,90
M 18	1	110	25	14	11	17	133975 1810	75,80
M 18	1.5	110	25	14	11	16.5	133975 1815	63,50
M 20	1	125	25	16	12	19	133975 2010	77,20
M 20	1.5	125	25	16	12	18.5	133975 2015	64,70
M 20	2	140	34	16	12	18	133975 2020	75,80
M 22	1	125	25	18	14.5	21	133975 2210	102,50
M 22	1.5	125	25	18	14.5	20.5	133975 2215	81,-
M 22	2	140	34	18	14.5	20	133975 2220	77,20
M 24	1	140	28	18	14.5	23	133975 2410	102,30
M 24	1.5	140	28	18	14.5	22.5	133975 2415	86,60
M 24	2	140	28	18	14.5	22	133975 2420	102,50

1128



## VA-SFT machine tap

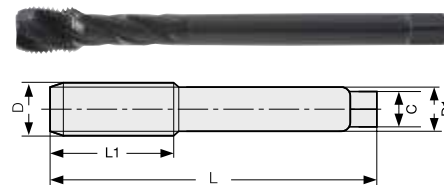
MF 60° HSS-E V3 DIN 374 ISO 2 6H C 2,5 40° 2,5xD Vap. Vc/fz 407

- ISO 6H fine-pitch metric thread
- 40° spiral-fluted with spiral point, type C, 2.5-thread chamfer
- For blind-hole threads
- **Cutting material: HSS-E V3, vapour-treated**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	<700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si		<55 HRc	<60 HRc	≥60 HRc	
		● 5-10	● 5-15		● 5-10	● 5-12	● 5-8				○ 2-6		○ 20-40		○ 10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.35	56	4	2.2	-	2.7	133515 0303	24,20
M 4	0.5	63	6	2.8	2.1	3.5	133515 0405	24,20
M 5	0.5	70	7	3.5	2.7	4.5	133515 0505	24,90
M 6	0.5	80	8	4.5	3.4	5.5	133515 0605	24,90
M 6	0.75	80	8	4.5	3.4	5.3	133515 0607	24,30
M 8	0.75	80	10	6.0	4.9	7.3	133515 0807	25,60
M 8	1.0	90	10	6.0	4.9	7.0	133515 0810	25,70
M 10	1.0	90	12	7.0	5.5	9.0	133515 1010	28,-
M 10	1.25	100	20	7.0	5.5	8.8	133515 1012	28,-
M 12	1.0	100	16	9.0	7.0	11.0	133515 1210	32,50
M 12	1.5	100	14	9.0	7.0	10.5	133515 1215	32,50
M 14	1.5	100	16	11.0	9.0	12.5	133515 1415	42,30
M 16	1.5	100	16	12.0	9.0	14.5	133515 1615	48,70
M 18	1.5	110	12	14.0	11.0	16.5	133515 1815	56,-
M 20	1.5	125	9	16.0	12.0	18.5	133515 2015	69,90
M 22	1.5	125	20	18.0	14.5	20.5	133515 2215	75,60
M 24	1.5	140	24	18.0	14.5	22.5	133515 2415	94,60



1128

## VA-POT machine tap

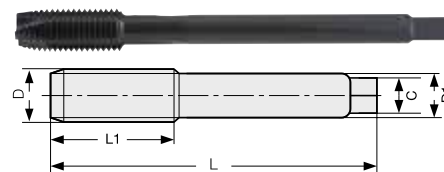
MF 60° HSS-E V3 DIN 374 ISO 2 6H B 4 2,5xD Vap. Vc/fz 407

- ISO 6H fine-pitch metric thread
- Straight-fluted with spiral point, type B, 4-thread chamfer
- For through-hole threads
- **Cutting material: HSS-E V3, vapour-treated**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	<700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si		<55 HRc	<60 HRc	≥60 HRc	
		● 5-20	● 5-15		● 5-10	● 5-12	● 5-8				○ 2-6		○ 20-40		○ 10-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.35	56	9	2.2	-	2.7	133505 0303	22,40
M 4	0.5	63	10	2.8	2.1	3.5	133505 0405	22,40
M 5	0.5	70	12	3.5	2.7	4.5	133505 0505	23,20
M 6	0.5	80	14	4.5	3.4	5.5	133505 0605	22,60
M 6	0.75	80	14	4.5	3.4	5.3	133505 0607	24,10
M 8	0.75	80	19	6.0	4.9	7.3	133505 0807	24,-
M 8	1.0	90	22	6.0	4.9	7.0	133505 0810	25,70
M 10	1.0	90	20	7.0	5.5	9.0	133505 1010	36,10
M 10	1.25	100	24	7.0	5.5	8.8	133505 1012	31,70

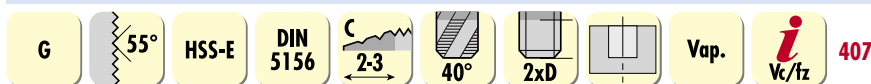


D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 12	1.0	100	22	9.0	7.0	11.0	133505 1210	30,40
M 12	1.5	100	22	9.0	7.0	10.5	133505 1215	30,40
M 14	1.5	100	22	11.0	9.0	12.5	133505 1415	45,10
M 16	1.5	100	22	12.0	9.0	14.5	133505 1615	52,-
M 18	1.5	110	25	14.0	11.0	16.5	133505 1815	65,10
M 20	1.5	125	25	16.0	12.0	18.5	133505 2015	66,20
M 22	1.5	125	25	18.0	14.5	20.5	133505 2215	83,10
M 24	1.5	140	28	18.0	14.5	22.5	133505 2415	88,80

1128

1128

## ATORN® Universal machine taps



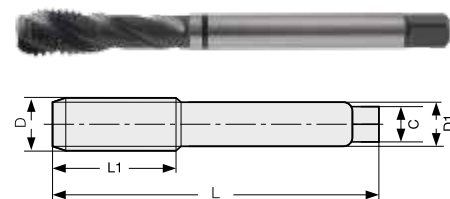
- Whitworth pipe thread, 55°
- 40° spiral-fluted
- Form C, 2-3 thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For blind-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		5-15	5-15		4-6	4-6			5-8				10-15		10-15				

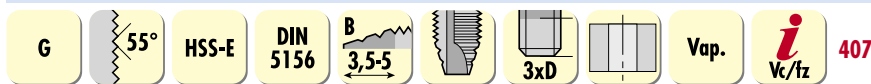
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	20	7	5.5	8.8	134770 0018	32,70
G 1/4"	19	100	22	11	9	11.8	134770 0014	42,-
G 3/8"	19	100	22	12	9	15	134770 0038	62,10
G 1/2"	14	125	25	16	12	19	134770 0012	93,10
G 3/4"	14	140	28	20	16	24.5	134770 0034	157,-
G 1"	11	160	30	25	20	31	134770 0100	178,-
G 1 1/4"	11	170	30	32	24	39.5	134770 0114	490,-

1127



## ATORN® Universal machine taps



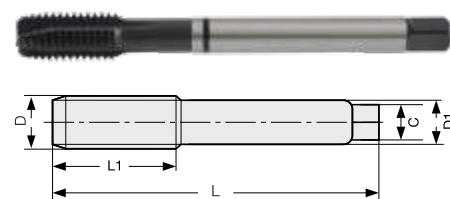
- Whitworth pipe thread, 55°
- 40° spiral-fluted
- Type B, 2.5-5 thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For through-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		5-15	5-15		4-6	4-6			5-8				10-15		10-15				

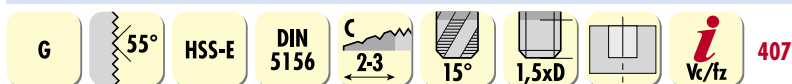
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	20	7	5.5	8.8	134775 0018	31,80
G 1/4"	19	100	22	11	9	11.8	134775 0014	40,70
G 3/8"	19	100	22	12	9	15	134775 0038	61,10
G 1/2"	14	125	25	16	12	19	134775 0012	90,10
G 3/4"	14	140	28	20	16	24.5	134775 0034	153,-
G 1"	11	160	30	25	20	31	134775 0100	174,-
G 1 1/4"	11	170	30	32	24	39.5	134775 0114	480,-

1127



## ATORN® Machine tap, weak-spiralled



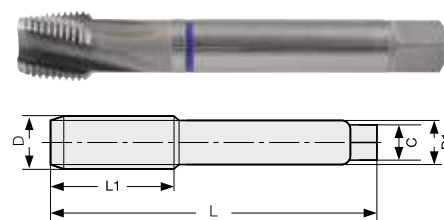
- Whitworth pipe thread, 55°
- 15°, right-hand, spiral-fluted
- Form C, 2-3 thread chamfer
- **Cutting material: HSS-E**
- For blind-hole threads
- Easy chip removal to the rear
- Possible thread depth 1.5 x D
- Suitable for conventional machining with quick-action chuck
- **Note:** for DIN-ISO 228/1 straight pipe threads

Up to 1000 N/mm<sup>2</sup>

material	● very well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	alloys	<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20											

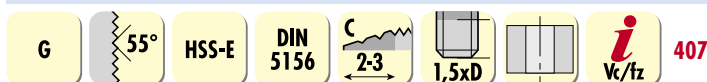
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	11	7	5.5	8.80	135315 0018	37,50
G 1/4"	19	100	14	11	9	11.80	135315 0014	49,10
G 3/8"	19	100	14	12	9	15.25	135315 0038	63,60
G 1/2"	14	125	18	16	12	19.00	135315 0012	77,30
G 3/4"	14	140	20	20	16	24.50	135315 0034	117,-
G 1"	11	160	24	25	20	30.75	135315 0100	234,-



1127

## ATORN® Machine tap



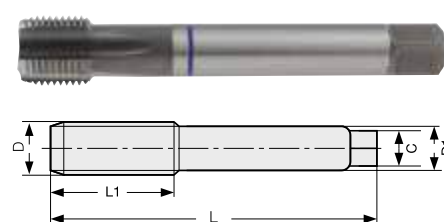
- Whitworth pipe thread, 55°
- Straight-fluted, without spiral point
- Through shank, type C, 2 to 3-thread chamfer
- **Cutting material: HSS-E**
- For through-hole threads
- Possible thread depth 1.5xD
- Suitable for conventional machining with quick-action chuck
- **Note:** for DIN-ISO 228/1 straight pipe threads

Up to 1000 N/mm<sup>2</sup>

material	● very well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	alloys	<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20											

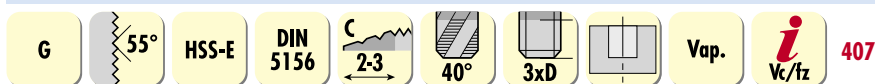
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	11	7	5.5	8.80	135300 0018	36,50
G 1/4"	19	100	14	11	9	11.80	135300 0014	50,30
G 3/8"	19	100	14	12	9	15.25	135300 0038	57,50
G 1/2"	14	125	18	16	12	19.00	135300 0012	91,60
G 3/4"	14	140	20	20	16	24.50	135300 0034	119,-
G 1"	11	160	24	25	20	30.75	135300 0100	178,-



1127

## ATORN® Machine tap



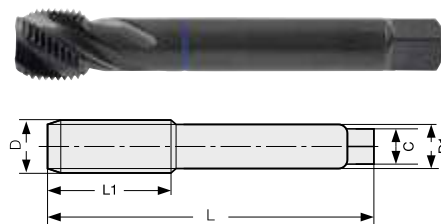
- Whitworth pipe thread, 55°
- 40°, spiral-fluted
- Type C, 2-3 thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For blind-hole threads
- Strong chip removal to the rear for long-chipping materials
- Minimal thread relief grinding
- Possible thread depth 3 x D
- Suitable for conventional machining with quick-action chuck
- **Note:** For DIN-ISO 228/1 straight pipe threads

**For long-chipping materials**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20										

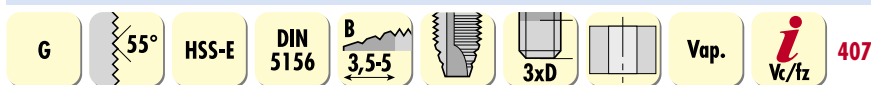
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	18	7	5.5	8.80	135320 0018	35,80
G 1/4"	19	100	20	11	9	11.80	135320 0014	49,30
G 3/8"	19	100	22	12	9	15.25	135320 0038	56,-
G 1/2"	14	125	25	16	12	19.00	135320 0012	90,10
G 3/4"	14	140	28	20	16	24.50	135320 0034	117,-
G 1"	11	160	30	25	20	30.75	135320 0100	174,-



1127

## ATORN® Machine tap

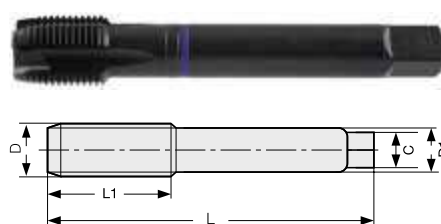


- Whitworth pipe thread, 55°
- Straight-fluted with spiral point
- Type B, 3.5-5 thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For through-hole threads
- Possible thread depth 3 x D
- **Note:** For DIN-ISO 228/1 straight pipe threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	11	7	5.5	8.80	135295 0018	29,-
G 1/4"	19	100	14	11	9	11.80	135295 0014	38,50
G 3/8"	19	100	14	12	9	15.25	135295 0038	44,10
G 1/2"	14	125	18	16	12	19.00	135295 0012	66,70
G 3/4"	14	140	20	20	16	24.50	135295 0034	119,-
G 1"	11	160	24	25	20	30.75	135295 0100	165,-



1127

## A-SFT machine tap

G
55°
HSS-E PM
DIN 5156
C 2,5
45°
2xD
TiCN
i Vc/fz
407

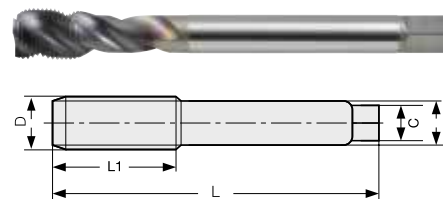
- Whitworth pipe thread, 55°
- 45°, spiral-fluted
- Type C, 2.5-thread chamfer
- Constructional dimensions DIN 5156
- **Cutting material: HSS-E-PM, TiCN-coated**
- For blind-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-60	10-60	8-30	8-20	8-20				5-10			15-35	15-35	15-35				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	20	7	5.5	8.8	133860 0018	60,30
G 1/4"	19	100	22	11	9	11.8	133860 0014	81,-
G 3/8"	19	100	22	12	9	15.25	133860 0038	102,-
G 1/2"	14	125	25	16	12	19	133860 0012	141,90
G 5/8"	14	125	25	18	14.5	21	133860 0058	174,30
G 3/4"	14	140	28	20	16	24.5	133860 0034	230,90
G 7/8"	14	150	28	22	18	28	133860 0078	302,10
G 1"	11	160	30	25	20	30.75	133860 0111	327,50

1128



## A-POT machine tap

G
55°
HSS-E PM
DIN 5156
B 4
2,5xD
TiCN
i Vc/fz
407

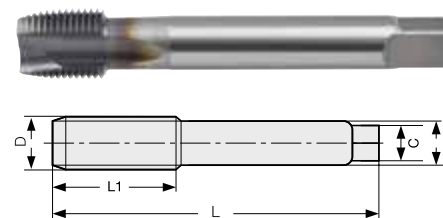
- Whitworth pipe thread, 55°
- Straight-fluted with spiral point
- Type B, 4-thread chamfer
- Constructional dimensions DIN 5156
- **Cutting material: HSS-E-PM, TiCN-coated**
- For through-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-60	10-60	8-30	8-20	8-20				5-10			15-35	15-35	15-35				

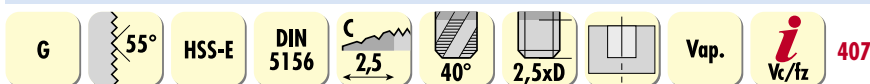
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	20	7	5.5	8.8	133900 0018	54,60
G 1/4"	19	100	22	11	9	11.8	133900 0014	73,10
G 3/8"	19	100	22	12	9	15	133900 0038	91,80
G 1/2"	14	125	25	16	12	19	133900 0012	127,70
G 5/8"	14	125	25	18	14.5	21	133900 0058	156,90
G 3/4"	14	140	28	20	16	24.5	133900 0034	207,90
G 7/8"	14	150	28	22	18	28	133900 0078	271,90
G 1"	11	160	30	25	20	31	133900 0111	294,90

1128



## S-SFT machine tap



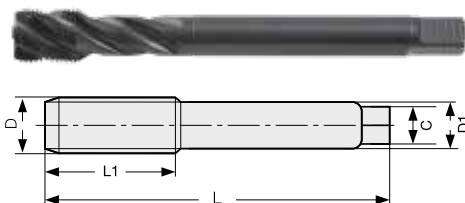
- Whitworth pipe thread, 55°
- 40° spiral-fluted
- Form C, 2.5-thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For blind-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-24	10-15	8-13	8-16	8-16	5-8		10-15						12-17				

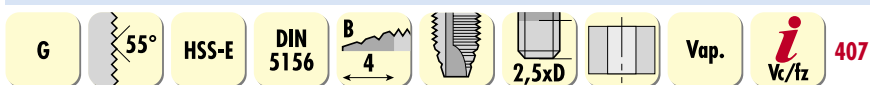
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	20	7	5.5	8.8	133986 0018	37,20
G 1/4"	19	100	22	11	9	11.8	133986 0014	49,90
G 3/8"	19	100	22	12	9	15	133986 0038	62,90
G 1/2"	14	125	25	16	12	19	133986 0012	87,20
G 5/8"	14	125	25	18	14.5	21	133986 0058	107,30
G 3/4"	14	140	28	20	16	24.5	133986 0034	142,10
G 7/8"	14	150	28	22	18	28	133986 0078	185,80
G 1"	11	160	30	25	20	31	133986 0010	201,60

1128



## S-POT machine tap



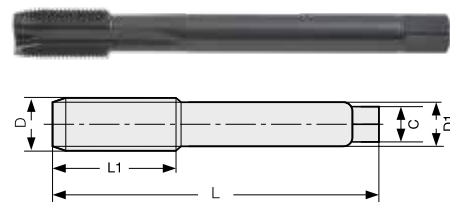
- Whitworth pipe thread, 55°
- Straight-fluted with spiral point
- Form B, 4-thread chamfer
- **Cutting material: HSS-E, vapour-treated**
- For through-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-24	10-15	8-13	8-16	8-16	5-8		10-15					12-17					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/8"	28	90	20	7	5.5	8.8	133987 0018	33,40
G 1/4"	19	100	22	11	9	11.8	133987 0014	44,90
G 3/8"	19	100	22	12	9	15	133987 0038	56,60
G 1/2"	14	125	25	16	12	19	133987 0012	78,60
G 5/8"	14	125	25	18	14.5	21	133987 0058	96,60
G 3/4"	14	140	28	20	16	24.5	133987 0034	127,90
G 7/8"	14	150	28	22	18	28	133987 0078	167,20
G 1"	11	160	30	25	20	31	133987 0010	181,40

1128





## ATORN® Universal machine taps



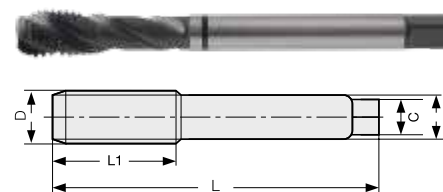
- **UNC thread, unified national standard coarse-pitch thread**
- Form C, 2-3 thread chamfer, for blind-hole threads
- Constructional dimensions similar to DIN 371 = up to 3/8", DIN 376 = from 7/16"
- **Cutting material: HSS-E, vapour-treated**
- Possible thread depth 2 x D
- **For universal applications**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
		<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si			<55 HRc	<60 HRc	≥60 HRc
		5-15	5-15		4-6	4-6			5-8				10-15		10-15				

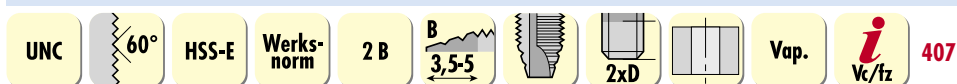
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
1/4"	20	80	13	7	5.5	5.2	134790 0001	28,30
5/16"	18	90	14	8	6.2	6.6	134790 0002	29,90
3/8"	16	100	16	9	7	8	134790 0003	35,70
7/16"	14	100	17	8	6.2	9.4	134790 0004	35,70
1/2"	13	110	20	9	7	10.8	134790 0005	45,40
5/8"	11	110	22	12	9	13.6	134790 0006	58,50
3/4"	10	125	25	14	11	16.5	134790 0007	65,60
7/8"	9	140	27	18	14.5	19.5	134790 0008	80,90
1"	8	160	30	20	16	22.3	134790 0009	113,-

1127



## ATORN® Universal machine taps



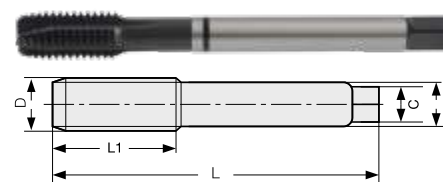
- **UNC thread, unified national standard coarse-pitch thread**
- Form B, 3,5-5 thread chamfer
- Straight-fluted with spiral point
- Constructional dimensions similar to DIN 371 = up to 3/8", DIN 376 = from 7/16"
- **Cutting material: HSS-E, vapour-treated**
- The spiral point ensures strong chip removal to the front
- Possible thread depth 2 x D
- **For universal applications**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
		<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si			<55 HRc	<60 HRc	≥60 HRc
		5-15	5-15		4-6	4-6			5-8				10-15		10-15				

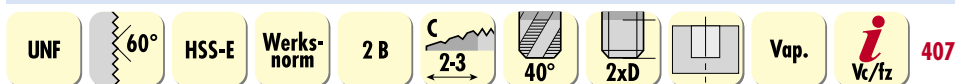
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
1/4"	20	80	17	7	5.5	5.2	134795 0001	28,30
5/16"	18	90	20	8	6.2	6.6	134795 0002	29,90
3/8"	16	100	22	9	7	8	134795 0003	35,70
7/16"	14	100	22	8	6.2	9.4	134795 0004	35,70
1/2"	13	110	25	9	7	10.8	134795 0005	45,40
5/8"	11	110	27	12	9	13.6	134795 0006	58,50
3/4"	10	125	30	14	11	16.5	134795 0007	65,60
7/8"	9	140	32	18	14.5	19.5	134795 0008	80,90
1"	8	160	36	20	16	22.3	134795 0009	113,-

1127



## ATORN® Universal machine taps



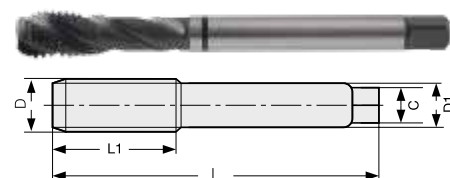
- **UNF thread, unified national standard fine-pitch thread**
- Form C, 2-3 thread chamfer, for blind-hole threads
- **Cutting material: HSS-E, vapour-treated**
- Possible thread depth 2 x D
- **For universal applications**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		ERP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 5-15	● 5-15		○ 4-6	○ 4-6			○ 5-8				○ 10-15		○ 10-15				

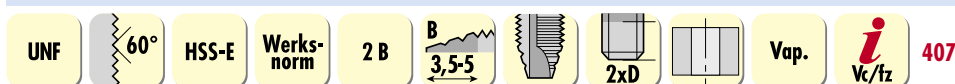
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
1/4"	28	80	10	7	5.5	5.5	134791 0001	32,90
5/16"	24	90	10	8	6.2	6.9	134791 0002	35,70
3/8"	24	100	10	9	7	8.5	134791 0003	37,40
7/16"	20	100	13	8	6.2	9.9	134791 0004	47,20
1/2"	20	100	13	9	7	11.5	134791 0005	45,90
5/8"	18	100	15	12	9	14.5	134791 0006	63,60
3/4"	16	110	17	14	11	17.5	134791 0007	82,40
7/8"	14	125	17	18	14.5	20.4	134791 0008	105,-
1"	12	140	20	18	14.5	23.3	134791 0009	156,-

1127



## ATORN® Universal machine taps



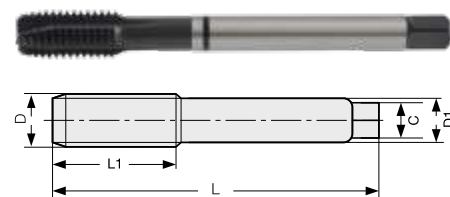
- **UNF thread, unified national standard fine-pitch thread**
- Form B, 3.5-5 thread chamfer
- Straight-fluted with spiral point
- **Cutting material: HSS-E, vapour-treated**
- The spiral point ensures strong chip removal to the front
- Possible thread depth 2 x D
- **For universal applications**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 5-15	● 5-15		○ 4-6	○ 4-6			○ 5-8				○ 10-15		○ 10-15				

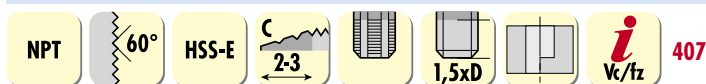
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
1/4"	28	80	17	7	5.5	5.5	134796 0001	32,90
5/16"	24	90	18	8	6.2	6.9	134796 0002	35,70
3/8"	24	100	18	9	7	8.5	134796 0003	37,40
7/16"	20	100	22	8	6.2	9.9	134796 0004	47,20
1/2"	20	100	22	9	7	11.5	134796 0005	45,90
5/8"	18	100	22	12	9	14.5	134796 0006	63,60
3/4"	16	110	25	14	11	17.5	134796 0007	82,40
7/8"	14	125	26	18	14.5	20.4	134796 0008	105,-
1"	12	140	28	18	14.5	23.3	134796 0009	156,-

1127



## ATORN® Machine tap

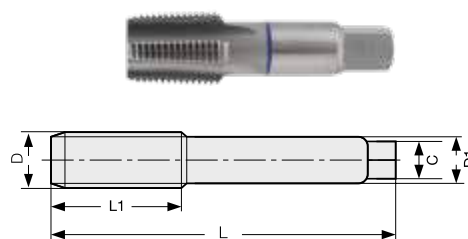


- American national standard tapered pipe thread, NPT 60°
- Straight-fluted
- Form C, 2 to 3-thread chamfer
- **Cutting material: HSS-E**
- for blind bore and through-hole threads
- Possible thread depth 1.5xD
- Taper reamer suitable for conical tapping holes (taper 1:16) available on request

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20										

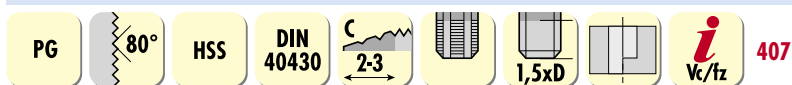
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
NPT 1/16"	27	56	14	6	4.9	6.10	135345 0001	44,80
NPT 1/8"	27	63	15	7	5.5	8.50	135345 0002	49,-
NPT 1/4"	18	63	21	11	9	11.00	135345 0003	61,10
NPT 3/8"	18	70	21	12	9	14.50	135345 0004	78,90
NPT 1/2"	14	80	27	16	12	18.00	135345 0005	105,-
NPT 3/4"	14	100	27	20	16	23.00	135345 0006	130,50
NPT 1"	11.5	110	32	25	20	29.00	135345 0007	185,50



1127

## ATORN® Machine tap

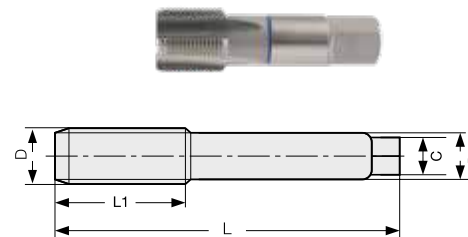


- Reinforced straight pipe thread 80°
- Straight-fluted
- Without spiral point
- **Cutting material: HSS-E**
- For blind-hole and through-hole threads

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		● 5-20	○ 5-15																

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.





D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
PG 7	20	70	22	9	7	11.40	135380 0070	30,90
PG 9	18	70	22	12	9	14.00	135380 0090	39,80
PG 11	18	80	22	14	11	17.30	135380 0110	56,-
PG 13.5	18	80	22	16	12	19.00	135380 0135	57,50
PG 16	18	80	22	18	14.5	21.30	135380 0160	64,60
PG 21	16	90	22	22	18	26.90	135380 0210	110,-
PG 29	16	100	25	28	22	35.50	135380 0290	171,-



1127

## Overview of forming taps

Sorting by thread and cutting material	Forming taps											
												
Brand	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN
Thread	M	M	M	M	M	M	M	M	M	M	M	M
ISO	P M K S N	P M K S N	P M K S N	P M K S N	P M N	P M K S N	P M S N	P M K S N	P M S N	P M N	P M N	P M K S N
Type	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole
Range	M1 - M20	M2 - M12	M3 - M12	M3 - M12	M3 - M16	M3 - M20	M3 - M20	M3 - M12	M5 - M20	M1 - M30	M5 - M30	M2 - M10
Tolerance	6HX	6GX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX
DIN	2174	2174	2174	2174	371/376	2174	WN	371/376	371	2174	2174	371
Chamfer (form)	C	C	C	C	C	C	C	C	C	C	C	C
Possible thread depth	1xD	1xD	3xD	3xD	2xD	2xD	2xD	2xD	2xD	2.5xD	2.5xD	2.5xD
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E	HSS-E	HSS-E
Coating / surface treatment	TiN	TiN	TiN	TiAlN	TiCN	TiCN	TiN	TiCN	TiAlN	TiCN	TiCN	TiCN
Type					UNI		Extra-long			S-XPf	S-OIL-XPf	V-NRT-B
Info			with oil grooves	with oil grooves	Synchro	with oil grooves	Coolant bore	with oil grooves	Coolant bore	with oil grooves	Coolant bore	
Item number	135405....	135450....	135240....	135245....	134730....	135460....	135410....	134194....	135430....	133920....	133925....	133320....
Page	290	290	291	291	291	292	292	293	293	294	294	294

Sorting by thread and cutting material	Forming taps			
				
Brand	ATORN	ATORN	ATORN	ATORN
Thread	MF	MF	M	G
ISO	P M K S N	P M N	P M N	P M S N
Type	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole	Blind-hole/ through-hole
Range	M6 - M24	M4 - M22	M8 - M24	1/16" - 3/4"
Tolerance	6HX	6HX	6HX	
DIN	2174	2174	2174	2189
Chamfer (form)	C	C	C	C
Possible thread depth	2.5xD	2.5xD	2.5xD	2xD
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E
Coating / surface treatment	TiN	TiCN	TiCN	TiN
Type		S-XPf	S-OIL-XPf	
Info	with oil grooves	with oil grooves	Coolant bore	with oil grooves
Item number	135480....	133930....	133935....	135495....
Page	295	296	296	297



## ATORN® Machine forming taps

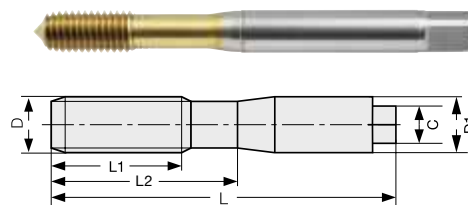
M
60°
HSS-E
DIN 2174
ISO 6HX
C 2-3
1xD
TiN
i Vc/fz
407

- **Metric ISO 6HX thread**
- Form C, 2-3 thread chamfer
- without oil grooves
- Constructional dimensions DIN 2174
- **Cutting material: HSS-E TiN**
- For blind-hole and through-hole threads
- For materials with good cold-forming properties and a min. expansion of 8 %

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		8-60	8-45		8-30	8-36	8-22		12-45	3-9	3-9		45-90							

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 1	0.25	40	4	-	2.5	2.1	0.90	135405 0010	40,80
M 1.2	0.25	40	4.8	-	2.5	2.1	1.10	135405 0012	40,20
M 1.4	0.3	40	5.6	-	2.5	2.1	1.26	135405 0014	38,90
M 1.6	0.35	40	6.4	-	2.5	2.1	1.45	135405 0016	38,10
M 1.8	0.35	40	7.2	-	2.5	2.1	1.65	135405 0018	35,60
M 2	0.4	45	8	-	2.8	2.1	1.85	135405 0020	32,30
M 2.5	0.45	50	9	-	2.8	2.1	2.30	135405 0025	33,40
M 3	0.5	56	11	18	3.5	2.7	2.75	135405 0030	25,70
M 3.5	0.6	56	12	20	4	3	3.25	135405 0035	28,90
M 4	0.7	63	13	21	4.5	3.4	3.65	135405 0040	21,20
M 5	0.8	70	16	25	6	4.9	4.60	135405 0050	21,70
M 6	1.0	80	19	30	6	4.9	5.55	135405 0060	22,30
M 8	1.25	90	22	35	8	6.2	7.40	135405 0080	27,50
M 10	1.5	100	24	39	10	8	9.30	135405 0100	38,60
M 12	1.75	110	24	-	9	7	11.20	135405 0120	64,60
M 14	2.0	110	26	-	11	9	13.10	135405 0140	117,-
M 16	2.0	110	26	-	12	9	15.10	135405 0160	104,-
M 20	2.5	140	32	-	16	12	18.90	135405 0200	194,50



1127

## ATORN® Machine forming taps tolerance 6GX

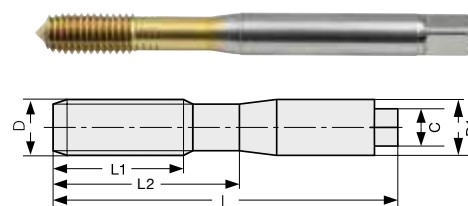
M
60°
HSS-E
DIN 2174
ISO 3 6G
C 2-3
1xD
TiN
i Vc/fz
407

- **Metric ISO-6GX thread**
- Form C, 2-3 thread chamfer
- without oil grooves
- Constructional dimensions DIN 2174
- **Cutting material: HSS-E TiN**
- For blind-hole and through-hole threads
- For materials with good cold-forming properties and a min. expansion of 8 %

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		8-60	8-45		8-30	8-36	8-22		12-45	3-9	3-9		45-90							

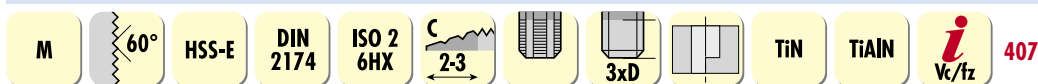
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.85	135450 0020	34,90
M 2.5	0.45	50	9	-	2.8	2.1	2.30	135450 0025	31,40
M 3	0.5	56	11	18	3.5	2.7	2.75	135450 0030	29,70
M 3.5	0.6	56	12	20	4	3	3.25	135450 0035	32,60
M 4	0.7	63	13	21	4.5	3.4	3.65	135450 0040	29,70
M 5	0.8	70	16	25	6	4.9	4.60	135450 0050	30,90
M 6	1.0	80	19	30	6	4.9	5.55	135450 0060	30,90
M 8	1.25	90	22	35	8	6.2	7.40	135450 0080	36,70
M 10	1.5	100	24	39	10	8	9.30	135450 0100	50,20
M 12	1.75	110	24	-	9	7	11.20	135450 0120	71,70



1127

## ATORN® Machine forming taps



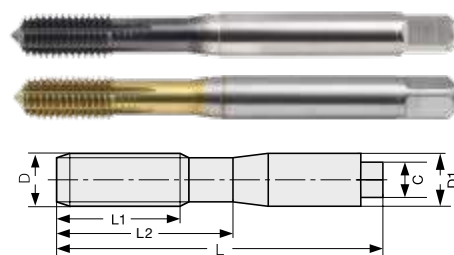
- ISO 6HX metric thread
- Type C, 2-3 thread chamfer
- With oil grooves
- Constructional dimensions DIN 2174
- **Cutting material: HSS-E TiN; HSS-E TiAlN**
- For blind-hole and through-hole threads
- For materials with good cold-forming properties and a min. expansion of 8 %
- Possible thread depth 3 x D

**With oil grooves**

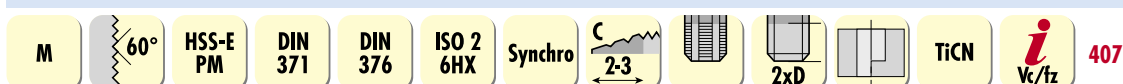
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		8-60	8-45		8-30	8-36	8-22		12-45		3-9		45-90		15-30				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	TiN		TiAlN	
								art.no.	€	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.75	135240 0030	26,70	135245 0030	28,-
M 4	0.7	63	12	21	4.5	3.4	3.65	135240 0040	22,20	135245 0040	23,30
M 5	0.8	70	14	25	6	4.9	4.60	135240 0050	23,30	135245 0050	24,50
M 6	1.0	80	16	30	6	4.9	5.55	135240 0060	24,10	135245 0060	25,30
M 8	1.25	90	18	35	8	6.2	7.40	135240 0080	28,50	135245 0080	29,90
M 10	1.5	100	20	39	10	8	9.30	135240 0100	40,50	135245 0100	42,60
M 12	1.75	110	24	-	9	7	11.10	135240 0120	64,60	135245 0120	67,70
								1127			1127



## ATORN® Universal Synchro machine forming tap

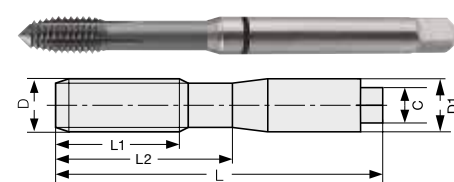


- ISO 6HX metric thread
- With oil grooves
- DIN 371 = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM, TiCN-coated**
- **Shank tolerance h6**
- Possible thread depth 2xD
- Synchro tool for CNC machines (rigid clamping or minimal length compensation)

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		15-40	10-30		5-18	5-18							10-40		10-30				

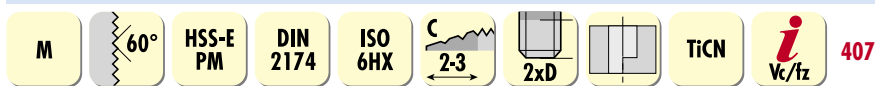
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 4	0.7	63	6	21	4.5	3.4	3.65	134730 0040	49,80
M 5	0.8	70	7	25	6	4.9	4.60	134730 0050	50,10
M 6	1.0	80	8	30	6	4.9	5.55	134730 0060	52,40
M 8	1.25	90	10	35	8	6.2	7.40	134730 0080	64,10
M 10	1.5	100	12	39	10	8	9.30	134730 0100	78,40
M 12	1.75	110	18	-	9	7	11.10	134730 0120	102,-
M 16	2.0	110	20	-	12	9	15.10	134730 0160	115,-
								1127	





## ATORN® Machine forming taps



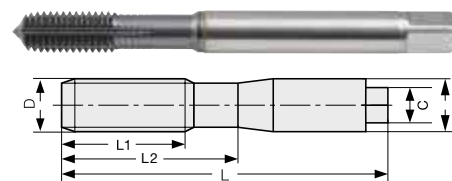
- **ISO 6HX metric thread**
- Type C, 2-3 thread chamfer
- With oil grooves
- Constructional dimensions DIN 2174
- **Cutting material: HSS-E-PM TiCN**
- For blind-hole and through-hole threads
- For materials with good cold-forming properties and a min. expansion of 8 %

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		8-60	8-45		8-30	8-36	8-22			12-45	3-9	3-9							

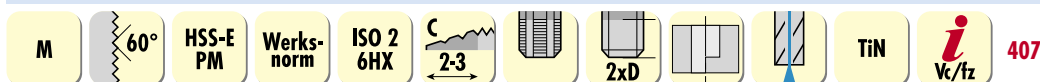
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	11	18	3.5	2.7	2.75	135460 0030	36,90
M 4	0.7	63	13	21	4.5	3.4	3.65	135460 0040	45,80
M 5	0.8	70	16	25	6	4.9	4.60	135460 0050	51,90
M 6	1.0	80	19	30	6	4.9	5.55	135460 0060	54,-
M 8	1.25	90	22	35	8	6.2	7.40	135460 0080	62,60
M 10	1.5	100	24	39	10	8	9.30	135460 0100	75,30
M 12	1.75	110	24	-	9	7	11.20	135460 0120	98,70
M 16	2.0	110	26	-	12	9	15.10	135460 0160	151,-
M 20	2.5	140	32	-	16	12	18.90	135460 0200	191,50

1127



## ATORN® Machine forming taps, long



- **Metric ISO 6HX thread**
- Form C, 2-3 thread chamfer
- With oil grooves
- **Cutting material: HSS-E-PM, TiN**
- For blind-hole and through-hole threads
- **Extra-long range to bridge protruding contours**
- With axial coolant bore outlet
- Possible thread depth 2 x D
- **With internal coolant supply from M6**
- **Also available in metric fine (MF) version**

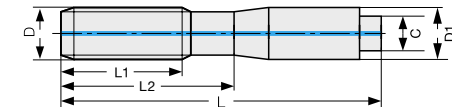
**Long version**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		8-60	8-45	8-30	8-30	8-36	8-22					3-9							

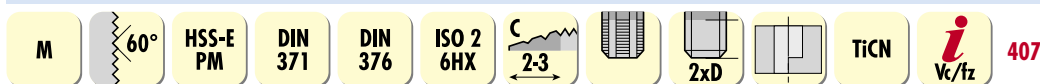
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	112	6	18	3.5	2.7	2.80	135410 0030	184,50
M 4	0.7	112	7.5	21	2.8	2.1	3.70	135410 0040	209,-
M 5	0.8	125	8.5	25	3.5	2.7	4.65	135410 0050	214,-
M 6	1.0	125	11	30	4.5	3.4	5.55	135410 0060	229,-
M 8	1.25	140	14	35	6	4.9	7.40	135410 0080	255,-
M 10	1.5	160	16	39	7	5.5	9.30	135410 0100	321,-
M 12	1.75	180	18.5	49	9	7	11.20	135410 0120	365,-
M 16	2.0	220	20	54	12	9	15.10	135410 0160	435,-
M 20	2.5	280	25	62	16	12	18.90	135410 0200	529,-

1127



## ATORN® Machine forming taps



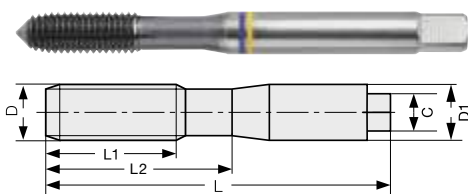
- **ISO 6HX metric thread**
- Type C, 2-3 thread chamfer
- With oil grooves
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM TiCN**
- For blind-hole and through-hole threads
- For steel, hardened and tempered steels, and chemically stable steels
- Possible thread depth 2xD

**Ideal for steel and stainless steel**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		8-60	8-45		8-30	8-36	8-22		12-45		6-9		45-90		15-30				

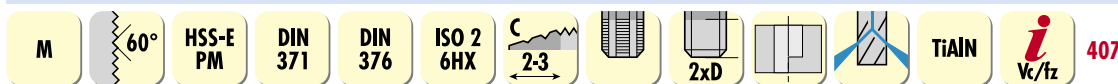
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.75	134194 0305	35,-
M 4	0.7	63	12	21	4.5	3.4	3.65	134194 0407	35,10
M 5	0.8	70	14	25	6	4.9	4.60	134194 0508	36,50
M 6	1.0	80	16	30	6	4.9	5.55	134194 0610	37,70
M 8	1.25	90	18	35	8	6.2	7.40	134194 0812	47,30
M 10	1.5	100	20	39	10	8	9.30	134194 1015	57,50
M 12	1.75	110	22	-	9	7	11.10	134194 1217	76,80



1127

## ATORN® Machine forming tap with internal cooling



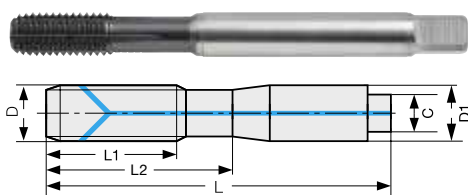
- **ISO 6HX metric thread**
- Type C, 2-3 thread chamfer
- With oil grooves
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E-PM TiAlN**
- For blind-hole and through-hole threads
- For materials up to max. 1200 N/mm²
- With radial coolant bore outlet
- Possible thread depth 2xD

**Radial coolant bore outlet**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		8-60	8-45	8-30	8-30	8-36	8-22				3-9		45-90	15-45	15-30				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 5	0.8	70	14	25	6	4.9	4.65	135430 0050	80,90
M 6	1.0	80	16	30	6	4.9	5.55	135430 0060	94,10
M 8	1.25	90	17	35	8	6.2	7.40	135430 0080	97,20
M 10	1.5	100	20	39	10	8	9.30	135430 0100	122,50
M 12	1.75	110	24	-	9	7	11.20	135430 0120	144,50
M 14	2.0	110	26	-	11	9	13.10	135430 0140	214,-
M 16	2.0	110	26	-	12	9	15.10	135430 0160	219,-
M 20	2.5	140	32	-	16	12	18.90	135430 0200	285,-



1127

## V-NRT-B machine forming tap

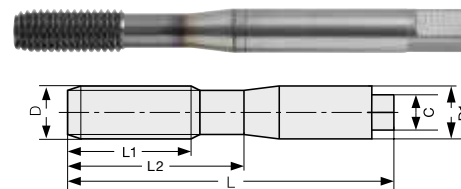
M
60°
HSS-E
DIN 371
DIN 376
ISO 2 6HX
C 2
2,5xD
TiCN
i Vc/fz 407

- Metric ISO 6HX thread
- Type C, 2-thread chamfer
- For blind-hole threads
- **Cutting material: HSS-E TiCN**
- **Also available in Tolerance 6GX version**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8% Si	≥8% Si	Co-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		8-60	8-45		8-30	8-36	8-22		12-45		3-9	45-90	15-45	15-30					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 2	0.4	45	8	8	2.8	2.1	1.85	133320 0020	35,70
M 2.2	0.45	45	9	8	2.8	2.1	2.00	133320 0022	37,90
M 2.5	0.45	50	9	9	2.8	2.1	2.30	133320 0025	35,10
M 3	0.5	56	11	18	3.5	2.7	2.75	133320 0030	33,40
M 3.5	0.6	56	13	20	4.0	3.0	3.25	133320 0035	34,80
M 4	0.7	63	13	21	4.5	3.4	3.65	133320 0040	34,-
M 5	0.8	70	16	25	6.0	4.9	4.60	133320 0050	34,50
M 6	1.0	80	19	30	6.0	4.9	5.55	133320 0060	35,10
M 8	1.25	90	22	35	8.0	6.2	7.40	133320 0080	38,30
M 10	1.5	100	24	39	10.0	8.0	9.30	133320 0100	45,90
M 12	1.75	110	29	-	9.0	7.0	11.20	133330 0120	52,40



1128

## S-XPF and S-OIL-XPF machine forming taps

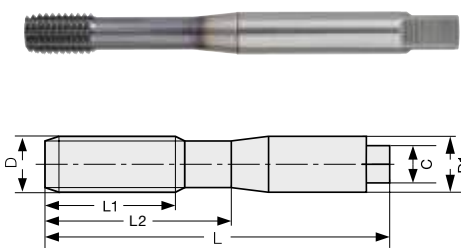
M
60°
HSS-E
DIN 2174
ISO 2 6HX
C 2,5
2,5xD
TiCN
i Vc/fz 407

- Metric ISO 6HX thread
- ISO 2/4HX where ≤ M1.4
- Form C, 2.5-thread chamfer
- With oil grooves ≥ M3
- 133925.... with radial coolant outlet

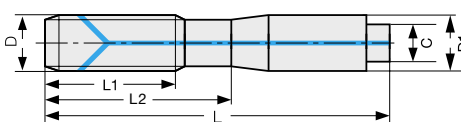
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8% Si	≥8% Si	Co-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		15-40	15-40		8-20	8-20	8-20					20-50		10-30					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€	With internal cooling art.no.	€
M 1	0.25	40	4	-	2.5	2.1	0.90	133920 0010	60,50		
M 1.2	0.25	40	4.8	-	2.5	2.1	1.10	133920 0012	58,30		
M 1.4	0.3	40	5.6	-	2.5	2.1	1.26	133920 0014	57,60		
M 1.6	0.35	40	6.4	-	2.5	2.1	1.45	133920 0016	56,50		
M 2	0.4	45	8	-	2.8	2.1	1.85	133920 0020	44,90		
M 2.5	0.45	50	9	-	2.8	2.1	2.30	133920 0025	44,-		
M 3	0.5	56	11	18	3.5	2.7	2.75	133920 0030	42,20		
M 4	0.7	63	13	21	4.5	3.4	3.65	133920 0040	42,70		
M 5	0.8	70	16	25	6	4.9	4.65	133920 0050	43,20	133925 0050	68,40
M 6	1.0	80	19	30	6	4.9	5.55	133920 0060	44,-	133925 0060	62,60
M 8	1.25	90	22	35	8	6.2	7.40	133920 0080	48,80	133925 0080	65,90
M 10	1.5	100	24	39	10	8	9.30	133920 0100	58,30	133925 0100	72,40
M 12	1.75	110	17	-	9	7	11.20	133920 0120	69,-	133925 0120	84,40
M 14	2.0	110	20	-	11	9	13.10	133920 0140	85,80	133925 0140	98,70
M 16	2.0	110	20	-	12	9	15.10	133920 0160	118,-	133925 0160	131,70
M 18	2.5	125	20	-	14	11	16.90	133920 0180	135,30	133925 0180	148,20
M 20	2.5	140	20	-	16	12	18.90	133920 0200	154,70	133925 0200	213,70
M 22	2.5	140	20	-	18	14.5	20.80	133920 0220	207,70	133925 0220	254,30
M 24	3.0	160	24	-	18	14.5	22.50	133920 0240	218,70	133925 0240	272,70
M 27	3.0	160	18	-	20	16	25.50	133920 0270	252,90	133925 0270	313,80
M 30	3.5	180	21	-	22	18	28.20	133920 0300	271,50	133925 0300	356,20



133920....



133925....

1128

1128

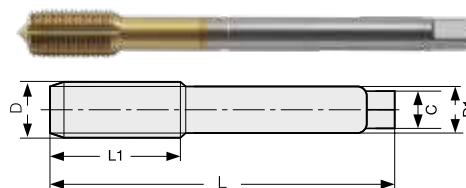
# ATORN® Machine forming taps

MF 60° HSS-E DIN 2174 ISO 2 6HX C 2-3 2,5xD TiN Vc/fz 407

- **Metric ISO 6HX fine thread**
- Form C, 2-3 thread chamfer
- With oil grooves
- Constructional dimensions DIN 2174
- **Cutting material: HSS-E TiN**
- For blind-hole and through-hole threads
- For materials with good cold-forming properties and a min. expansion of 8 %
- Possible thread depth 2.5 x D

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		8-60	8-45		8-30	8-36	8-22		12-45		3-9		45-90		15-30				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



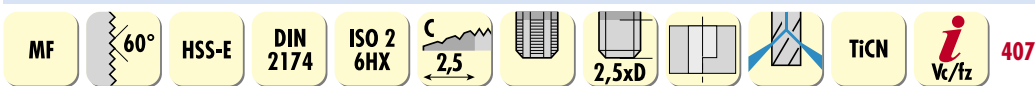
D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 6	0.75	80	30	4.5	3.4	5.65	135480 0675	43,30
M 8	0.75	80	30	6	4.9	7.65	135480 0875	49,-
M 8	1.0	90	35	6	4.9	7.55	135480 0810	38,50
M 10	1.0	90	35	7	5.5	7.55	135480 1010	39,50
M 10	1.25	100	39	7	5.5	9.40	135480 1012	52,90
M 12	1.0	100	40	9	7	11.55	135480 1210	50,10
M 12	1.25	100	40	9	7	11.40	135480 1212	54,-
M 12	1.5	100	40	9	7	11.30	135480 1215	51,90
M 14	1.0	100	40	11	9	13.55	135480 1410	67,20

1127

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
M 14	1.5	100	40	11	9	13.30	135480 1415	64,60
M 16	1.0	100	44	12	9	15.55	135480 1610	86,50
M 16	1.5	100	44	12	9	15.30	135480 1615	61,60
M 18	1.0	110	44	14	11	17.55	135480 1810	100,50
M 18	1.5	110	44	14	11	17.30	135480 1815	89,50
M 20	1.0	125	44	16	12	19.55	135480 2010	119,-
M 20	1.5	125	44	16	12	19.30	135480 2015	102,-
M 22	1.5	125	44	18	14.5	21.30	135480 2215	130,50
M 24	1.5	140	48	18	14.5	23.30	135480 2415	136,50

1127

## S-XPF and S-OIL-XPF machine forming taps



- **Metric ISO 6HX fine thread**
- Form C, 2.5-thread chamfer
- With oil grooves
- **Cutting material: HSS-E, TiCN**
- For blind-hole and through-hole threads
- 133935... with radial coolant outlet



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	10-30	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●		●	●	●					●		●				
		15-40	15-40		8-20	8-20	8-20					20-50		10-30				

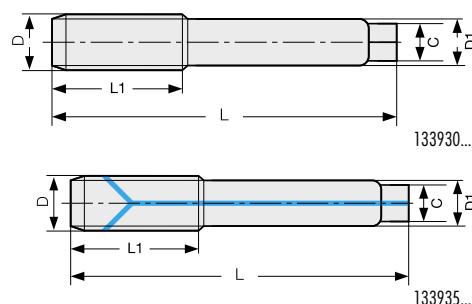
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**NEW**

D mm	Pitch mm	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€	With internal cooling art.no.	€
M 4	0.5	63	8	4.5	3.4	3.80	133930 0405	50,30		
M 5	0.5	70	8	6	4.9	4.80	133930 0505	51,10		
M 6	0.5	80	8	6	4.9	5.80	133930 0605	52,-		
M 6	0.75	80	8	6	4.9	5.70	133930 0607	52,-		
M 8	0.5	80	10	6	4.9	7.80	133930 0805	57,70		
M 8	0.75	80	10	6	4.9	7.70	133930 0807	57,70		
M 8	1.0	90	10	6	4.9	7.55	133930 0810	49,-	133935 0810	65,90
M 10	1.0	90	12	7	5.5	9.55	133930 1010	69,10	133935 1010	84,-
M 10	1.25	100	12	7	5.5	9.40	133930 1012	64,20	133935 1012	78,90
M 12	1.0	100	15	9	7	11.60	133930 1210	80,90	133935 1210	97,90
M 12	1.25	100	15	9	7	11.40	133930 1212	70,50	133935 1212	85,30
M 12	1.5	100	15	9	7	11.30	133930 1215	70,50	133935 1215	85,30
M 14	1.0	100	15	11	9	13.60	133930 1410	101,20	133935 1410	116,50
M 14	1.25	100	15	11	9	13.40	133930 1412	85,80	133935 1412	98,70
M 14	1.5	100	15	11	9	13.30	133930 1415	85,80	133935 1415	92,50
M 16	1.0	100	15	12	9	15.60	133930 1610	139,30	133935 1610	160,20
M 16	1.5	100	15	12	9	15.30	133930 1615	118,-	133935 1615	131,70
M 18	1.0	110	15	14	11	17.60	133930 1810	159,80	133935 1810	183,80
M 18	1.5	110	15	14	11	17.30	133930 1815	132,50	133935 1815	145,20
M 20	1.0	125	15	16	12	19.60	133930 2010	182,60	133935 2010	213,70
M 20	1.5	125	15	16	12	19.30	133930 2015	151,80	133935 2015	213,70
M 22	1.5	125	15	18	14.5	21.30	133930 2215	203,40	133935 2215	249,30
M 24	1.5	140	15	18	14.5	23.30	133930 2415	214,40	133935 2415	267,30

1128

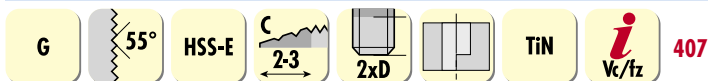
1128



133930...

133935...

## ATORN® Machine forming taps



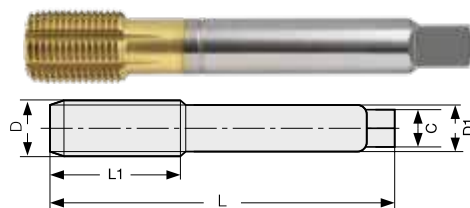
- Whitworth pipe thread, 55°
- DIN 2189
- Type C, 2-3 thread chamfer
- With oil grooves
- Constructional dimensions DIN 2174
- **Cutting material: HSS-E TiN**
- For blind-hole and through-hole threads

material	● very well suited	steel			stainless steel			cast iron			titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		8-50	8-45		8-30	8-36	8-22				3-9		45-90		15-30					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	Pitch TPI	L mm	L1 mm	D1 mm	C mm	Tapping hole Ø mm	art.no.	€
G 1/16"	28	90	18	6	4.9	7.30	135495 0116	42,70
G 1/8"	28	90	18	7	5.5	9.30	135495 0018	49,-
G 1/4"	19	100	20	11	9	12.50	135495 0014	60,60
G 3/8"	19	100	22	12	9	16.00	135495 0038	85,50
G 1/2"	14	125	25	16	12	20.00	135495 0012	112,-
G 3/4"	14	140	28	20	16	25.50	135495 0034	117,-

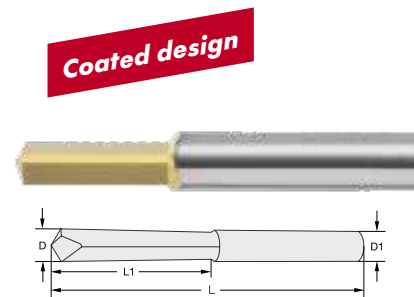
1127



## ATORN® Solid carbide tap drill-out tool



- Drill bit for extracting broken-off taps
- For drilling stellites and heat-treated steels (58 - 68 HRC)
- Straight shank
- **Cutting material: solid carbide, TiN-coated**



material	● very well suited	steel			stainless steel			cast iron			titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
																		11	11	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

for thread	D mm	L1 mm	L mm	D1 mm	art.no.	€
M3	2.5	10	38	3.0	114075 2025	36,50
M4	3.3	14	50	4.0	114075 2033	42,50
M5	4.2	19	50	5.0	114075 2042	49,10
M6	5.0	23	50	6.0	114075 2050	55,-
M8	6.8	23	80	8.0	114075 2068	59,50
M10	8.5	25	80	10.0	114075 2085	78,90
M12	10.2	35	80	12.0	114075 2102	114,-

1132

### 7 pcs. set

Contents		art.no.	€
Solid carbide tap extractor Ø 2.5 3.3 4.2 5.0 6.8 8.5 10.2 (1 of each)		114075 2120	430,-

1132





## THERMDRILL® Thermal drill bits (flow drill)



For a lower wall thickness, often only 1-2 threads can be inserted. These are generally not sufficient for a load-bearing thread. With the THERMDRILL process, you can create extremely stable thread bushes in seconds in only two steps. Protected against rotation and resistant to vibrations. Ideal for thin-walled sheet steel, pipes and profiles as the thread bushes are produced as if from one cast.

- **Wobbling, loosening or rotating (as with rivet nuts) no longer possible**
- Additional inserts no longer required
- **Especially suitable for round tubes**
- **Secure hold even in sheet metal and hollow profiles**
- No waste, chip-free process by using friction heat
- Better quality thread due to shaped instead of cut thread (material reinforcement)
- **Long service life of tools thanks to polygon-ground solid carbide**



### Basic equipment

- Incl. ER32 - Ø 6, 8 and 10 mm collets

Holding fixtures	Contents	art.no.	€
MT 2	1 each of paste 100 g, thread forming oil 100 ml, brass brush, bristle brush, spanner, hook wrench, tool holder with cooling ring, system case	102900 1000	380,-
MT3	1 each of paste 100 g, thread forming oil 100 ml, brass brush, bristle brush, spanner, hook wrench, tool holder with cooling ring, system case	102900 1001	410,-

1159



### FORM type tool sets

- including forming taps
- **for bushes with collar**
- Type FORM forms a bulge from material flowing upwards

Thread	Shank Ø mm	Design	t max. mm	art.no.	€
M 4	6	Short	1.5	102910 0040	103,-
M 4	6	long	2.5	102920 0040	103,-
M 5	6	Short	2.0	102910 0050	107,-
M 5	6	long	3.0	102920 0050	107,-
M 6	8	Short	2.0	102910 0060	116,-
M 6	8	long	3.5	102920 0060	116,-
M 8	8	Short	2.5	102910 0080	137,50
M 8	8	long	4.0	102920 0080	137,50
M 10	10	Short	2.5	102910 0100	164,-
M 10	10	long	4.5	102920 0100	164,-

1159



### CUT type tool sets

- including forming taps
- **for bushes without collar**
- Type CUT cuts the material protruding upwards flat

Thread	Shank Ø mm	Design	t max. mm	art.no.	€
M 4	6	Short	2.0	102930 0040	133,50
M 4	6	long	4.0	102940 0040	133,50
M 5	6	Short	3.0	102930 0050	160,-
M 5	6	long	4.5	102940 0050	160,-
M 6	8	Short	3.0	102930 0060	180,50
M 6	8	long	5.0	102940 0060	180,50
M 8	8	Short	4.0	102930 0080	195,50
M 8	8	long	6.0	102940 0080	195,50
M 10	10	Short	4.0	102930 0100	229,-
M 10	10	long	6.5	102940 0100	229,-

1159



**FORM type thermal drill bits**

**• for bushes with collar**

- Type FORM forms a bulge from material flowing upwards

Thread	Shank Ø mm	Design	f max. mm	art.no.	€
M 4	6	Short	1.5	<b>102901 0040</b>	<b>66,20</b>
M 4	6	long	2.5	102902 0040	66,20
M 5	6	Short	2.0	102901 0050	70,70
M 5	6	long	3.0	102902 0050	70,70
M 6	8	Short	2.0	102901 0060	77,90
M 6	8	long	3.5	102902 0060	77,90
M 8	8	Short	2.5	102901 0080	94,60
M 8	8	long	4.0	102902 0080	94,60
M 10	10	Short	2.5	102901 0100	116,-
M 10	10	long	4.5	102902 0100	116,-

1159



**CUT type thermal drill bits**

**• for bushes without collar**

- Type CUT cuts the material protruding upwards flat

Thread	Shank Ø mm	Design	f max. mm	art.no.	€
M 4	6	Short	2.0	<b>102903 0040</b>	<b>93,10</b>
M 4	6	long	4.0	102904 0040	93,10
M 5	6	Short	3.0	102903 0050	121,50
M 5	6	long	4.5	102904 0050	121,50
M 6	8	Short	3.0	102903 0060	138,50
M 6	8	long	5.0	102904 0060	138,50
M 8	8	Short	4.0	102903 0080	152,-
M 8	8	long	6.0	102904 0080	152,-
M 10	10	Short	4.0	102903 0100	180,50
M 10	10	long	6.5	102904 0100	180,50

1159



**Paste and thread forming oil**

- Paste to protect the thermal drill from excessive wear
- High-performance oil especially suitable for thread forming in aluminium, copper, brass, steel and stainless steel

Description	art.no.	€
Flow drill bit paste 100 g incl. brush	<b>102980 0100</b>	<b>27,20</b>
Flow drill bit paste 1 kg incl. brush	102980 1000	66,20
Thread forming oil 100 ml incl. brush	102981 0100	26,-
Thread forming oil 1 l incl. brush	102981 1000	50,70

1159



**Over 200,000 tools available online!**

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



**Register online now!**

**www.saratools.com**

# HELICOIL plus thread repair kits



- Contents for each coil thread:
- **HELICOIL plus** thread inserts in three lengths (1xD, 1.5xD and 2xD)
- Twist drill bits, hand taps made from HSS, installation mandrels and tang breakers **up to M12**
- From M3 to M6, 60 **HELICOIL** inserts in a repair pack, in 3 lengths (20 of each)
- From M8 to M16, 30 **HELICOIL** inserts in a repair pack, in 3 lengths (10 of each)

## Repair packs with metric thread inserts

for coil thread	Twist drill Ø mm	Number inserts	art.no.	€
M 3 x 0.5	3.2	60	<b>137060</b> 0003	51,40
M 4 x 0.7	4.2	60	137060 0004	55,30
M 5 x 0.8	5.2	60	137060 0005	53,—
M 6 x 1.0	6.3	60	137060 0006	46,90
M 8 x 1.25	8.4	30	137060 0008	46,60
M 10 x 1.5	10.5	30	137060 0010	57,20
M 12 x 1.75	12.5	30	137060 0012	59,—
M14 x 2.0	14.5	30	137060 0014	72,30
M 16 x 2.0	16.5	30	137060 0016	82,80

1149

## Repair kits with metric thread inserts

- Contents: **HELICOIL** plus thread inserts
- Various dimensions and lengths
- Twist drill bits and **HELICOIL** hand taps made from HSS
- **HELICOIL** installation mandrels, tang break-off tool

for coil thread	Number inserts	art.no.	€
M 5 - M 12	230	<b>137065</b> 0001	239,—
M6/M8/M10	132	137065 0002	173,—

1149

## Small refill packs

for coil thread	Contents	1 x D		1,5 x D		2 x D	
		art.no.	€	art.no.	€	art.no.	€
M3	20	<b>137061</b> 0003	12,60	<b>137062</b> 0003	14,45	<b>137063</b> 0003	16,65
M4	20	137061 0004	10,80	137062 0004	12,40	137063 0004	14,05
M5	20	137061 0005	13,30	137062 0005	15,20	137063 0005	16,95
M6	20	137061 0006	14,45	137062 0006	16,85	137063 0006	19,—
M8	10	137061 0008	7,90	137062 0008	9,30	137063 0008	10,30
M10	10	137061 0010	10,85	137062 0010	12,40	137063 0010	14,05
M12	10	137061 0012	25,10	137062 0012	28,90	137063 0012	32,50
M14	10	137061 0014	25,30	137062 0014	29,—	137063 0014	32,80
M16	10	137061 0016	34,70	137062 0016	39,90	137063 0016	45,20

## Large refill packs

for coil thread	Contents	1 x D		1,5 x D		2 x D	
		art.no.	€	art.no.	€	art.no.	€
M3	100			<b>137062</b> 0103	44,90		
M4	100	<b>137061</b> 0104	35,20	137062 0104	37,40	<b>137063</b> 0104	44,80
M5	100	137061 0105	38,90	137062 0105	41,80	137063 0105	50,90
M6	100	137061 0106	36,40	137062 0106	43,50	137063 0106	46,60
M8	100	137061 0108	42,20	137062 0108	52,90	137063 0108	59,50
M10	100	137061 0110	48,80	137062 0110	61,60	137063 0110	78,90
M12	100	137061 0112	66,20	137062 0112	91,60	137063 0112	122,50
M16	100	137061 0116	102,—	137062 0116	194,50	137063 0116	192,50
M20	100	137061 0120	311,—	137062 0120	370,—		

## Accessories

for coil thread	Hand taps		Installation mandrel		Tang break-off tool	
	art.no.	€	art.no.	€	art.no.	€
M3	<b>137066</b> 0003	7,40	<b>137067</b> 0003	9,15	<b>137068</b> 0003	4,60
M4	137066 0004	6,85	137067 0004	9,15	137068 0004	3,79
M5	137066 0005	7,30	137067 0005	9,15	137068 0005	4,01
M6	137066 0006	6,10	137067 0006	9,15	137068 0006	4,01
M8	137066 0008	8,30	137067 0008	9,15	137068 0008	1,85
M10	137066 0010	10,80	137067 0010	9,15	137068 0010	2,06
M12	137066 0012	13,55	137067 0012	9,15	137068 0012	2,27
M16	137066 0016	24,40	137067 0016	14,75		

1149

1149

1149



137065 0001



137065 0002



Hand taps



Installation mandrel



Tang break-off tool

## Overview of threading dies

	Threading dies									
Sorting by thread										
Brand	ATORN®	SARA®	ATORN®	SARA®	ATORN®	SARA®	ATORN®	ATORN®	ATORN®	SARA®
Thread	M	M	M-LH	M-LH	M	M	M	M	MF	MF
ISO	P M N	P M N	P M N	P M N	P M N	P M N	P M K N	P M K N	P M N	P M N
Range	M2.5 - M36	M2.5 - M36	M3 - M20	M3 - M20	M2 - M24	M2 - M24	M3 - M12	M3 - M12	M2 - M50	M2 - M36
Tolerance	6g	6g	6g	6g	6g	6g	6g	6g	6g	6g
DIN	22568	22568	22568	22568	22568	22568	Factory standard	Factory standard	22568	22568
Cutting material	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS vap.	HSS-E vap.	HSS	HSS
Type/info			Left-hand thread	Left-hand thread			One size	One size		
Item number	136001....	136004....	136010....	136014....	136005....	136045....	136101....	136105....	136015....	136016....
Page	302	302	303	303	303	303	304	304	305	305

	Threading dies				
Sorting by thread					
Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
Thread	MF-LH	MF	BSW	G	UNF
ISO	P M N	P M N	P M N	P M N	P M N
Range	M8 - M20	M5 - M30	BSW 1/8" - BSW 5/8"	G 1/8" - G 2"	UNF No.4 - UNF 5/8"
Tolerance	6g	6g	BS 84 medium	A	2A
DIN	22568	22568	22568	22568	22568
Cutting material	HSS	HSS-E	HSS	HSS	HSS
Type/info	Left-hand thread				
Item number	136025....	136020....	136035....	136040....	136050....
Page	306	306	307	307	307



Drilling and turning ...

... with a single tool.

**ATORN®**  
Performance demands quality

## ATORN® SARA® Threading dies

M
60°
HSS
DIN EN 22568
DIN 13 6g
*i* Vc/tz 408

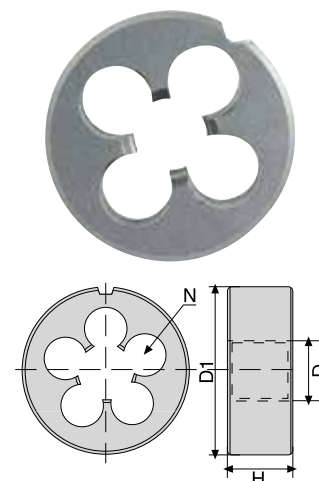
- For ISO metric thread, DIN 13
- Closed, pre-slotted shape
- From M3 with two-sided spiral point for clean and easy chip removal in the cutting direction
- Tolerance zone 6g
- **Cutting material: HSS**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	○		○	○						○		○					

ATORN® SARA®									
D mm	Pitch mm	D1 mm	H mm	N	art.no.	€	art.no.	€	
M 2.5	0.45	16	5	3	136001 0025	28,80	136004 0025	21,30	
M 2.6	0.45	16	5	3	136001 0026	31,-	136004 0026	23,60	
M 3	0.5	20	5	3	136001 0030	18,65	136004 0030	11,40	
M 3.5	0.6	20	5	3	136001 0035	29,30	136004 0035	23,20	
M 4	0.7	20	5	3	136001 0040	18,65	136004 0040	11,40	
M 4.5	0.75	20	7	4	136001 0045	43,80	136004 0045	33,40	
M 5	0.8	20	7	4	136001 0050	18,65	136004 0050	11,40	
M 6	1.0	20	7	4	136001 0060	18,65	136004 0060	11,40	
M 7	1.0	25	9	4	136001 0070	25,60	136004 0070	20,40	
M 8	1.25	25	9	4	136001 0080	20,70	136004 0080	12,65	
M 9	1.25	25	9	4	136001 0090	41,20	136004 0090	32,60	
M 10	1.5	30	11	4	136001 0100	26,70	136004 0100	16,10	
M 11	1.5	30	11	4	136001 0110	51,90	136004 0110	40,-	
M 12	1.75	38	14	4	136001 0120	33,-	136004 0120	19,85	
M 14	2.0	38	14	4	136001 0140	33,-	136004 0140	19,85	
M 16	2.0	45	18	4	136001 0160	44,70	136004 0160	27,30	
M 18	2.5	45	18	5	136001 0180	44,70	136004 0180	29,20	
M 20	2.5	45	18	5	136001 0200	44,70	136004 0200	33,40	
M 22	2.5	55	22	5	136001 0220	62,30	136004 0220	43,50	
M 24	3.0	55	22	5	136001 0240	62,30	136004 0240	45,90	
M 27	3.0	65	25	5	136001 0270	151,50	136004 0270	93,50	
M 30	3.5	65	25	6	136001 0300	151,50	136004 0300	98,-	
M 33	3.5	65	25	6	136001 0330	177,-	136004 0330	120,50	
M 36	4.0	65	25	7	136001 0360	175,-	136004 0360	129,-	

1126

1158



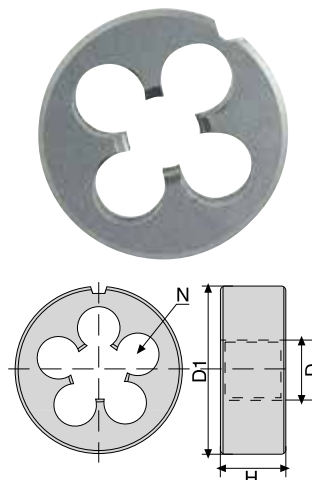
## ATORN® SARA® Left-hand threading die

MLH
60°
HSS
DIN EN 22568
DIN 13 6g
i Vc/tz
408

- For ISO left-hand metric thread, DIN 13
- Closed, pre-slotted shape
- From M3 with two-sided spiral point for clean and easy chip removal in the cutting direction
- Tolerance zone 6g
- **Cutting material: HSS**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc

D mm	Pitch mm	D1 mm	H mm	N	ATORN®		SARA®	
					art.no.	€	art.no.	€
M 3-LH	0.5	20	5	4	136010 0030	52,50	136014 0030	42,50
M 4-LH	0.7	20	5	4	136010 0040	49,20	136014 0040	39,70
M 5-LH	0.8	20	7	4	136010 0050	46,50	136014 0050	37,60
M 6-LH	1.0	20	7	4	136010 0060	46,50	136014 0060	37,60
M 8-LH	1.25	25	9	4	136010 0080	50,40	136014 0080	40,70
M 10-LH	1.5	30	11	4	136010 0100	61,70	136014 0100	49,90
M 12-LH	1.75	38	14	4	136010 0120	81,20	136014 0120	65,60
M 14-LH	2.0	38	14	4	136010 0140	81,20	136014 0140	65,60
M 16-LH	2.0	45	18	4	136010 0160	106,50	136014 0160	86,—
M 20-LH	2.5	45	18	5	136010 0200	109,—	136014 0200	88,—



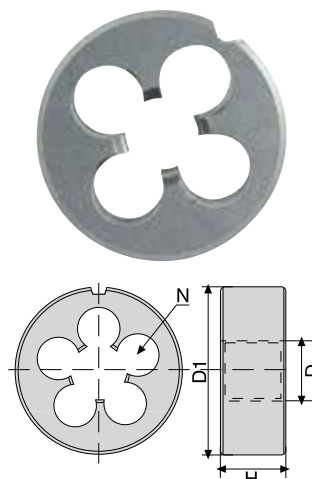
## ATORN® SARA® Threading dies

M
60°
HSS-E
DIN EN 22568
DIN 13 6g
i Vc/tz
408

- For DIN 13 metric ISO thread
- Closed, pre-slotted shape
- From M3 with two-sided spiral point for clean and easy chip removal in the cutting direction
- Tolerance field 6g
- **Cutting material HSS-E** (136005.... lapped and nitrided)

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc

D mm	Pitch mm	D1 mm	H mm	N	ATORN®		SARA®	
					art.no.	€	art.no.	€
M 2	0.4	16	5	4	136005 0020	60,30	136045 0020	48,80
M 3	0.5	20	5	4	136005 0030	37,70	136045 0030	26,60
M 4	0.7	20	5	4	136005 0040	36,50	136045 0040	25,80
M 5	0.8	20	7	4	136005 0050	33,90	136045 0050	24,10
M 6	1.0	20	7	4	136005 0060	33,90	136045 0060	24,10
M 8	1.25	25	9	5	136005 0080	40,60	136045 0080	28,40
M 10	1.5	30	11	5	136005 0100	48,30	136045 0100	33,70
M 12	1.75	38	14	5	136005 0120	64,30	136045 0120	44,70
M 14	2.0	38	14	5	136005 0140	70,20	136045 0140	48,80
M 16	2.0	45	18	5	136005 0160	83,40	136045 0160	58,80
M 18	2.5	45	18	5	136005 0180	102,—	136045 0180	68,90
M 20	2.5	45	18	5	136005 0200	93,40	136045 0200	65,30
M 24	3.0	55	22	6	136005 0240	141,50	136045 0240	98,30



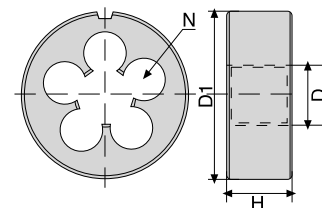


## ATORN® Threading die in one size

M
60°
HSS
HSS-E
Werks-norm
DIN 13 6g
Vap.
i Vc/fz
408

- Threading dies 25 x 9 mm
- For DIN 13 metric ISO thread
- Two-sided spiral point for good chip removal
- Larger chamfer diameter, chamfering of the bolt not necessary
- Thread lapped for smoother, burr-free cutting edges
- **Cutting material: HSS and HSS-E, vapour-treated**
- Increased surface hardness (nitriding process)
- Particularly suitable for mechanical applications due to the one-size-fits-all design

**Suitable for threading die holder 25 x 9 mm**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/EPF/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
136101....	●	●	●		○	○		○	○				●	●	●				
136105....	●	●	●		●	●		○	○				●	●	●				

D mm	Pitch mm	D1 mm	H mm	N mm	HSS		HSS-E	
					art.no.	€	art.no.	€
M 3	0.5	25	9	3	136101 0030	20,50	136105 0030	41,40
M 4	0.7	25	9	3	136101 0040	20,50	136105 0040	40,10
M 5	0.8	25	9	4	136101 0050	20,50	136105 0050	37,30
M 6	1.0	25	9	4	136101 0060	20,50	136105 0060	37,30
M 8	1.25	25	9	4	136101 0080	22,70	136105 0080	44,70
M 10	1.5	25	9	5	136101 0100	29,30	136105 0100	53,-
M 12	1.75	25	9	5	136101 0120	36,30	136105 0120	70,70
					1126		1126	



### Sets

Contents	HSS		HSS-E	
	art.no.	€	art.no.	€
Threading dies M 3 - 4 - 5 - 6 - 8 - 10 - 12 (1 of each)	136101 0312	162,-	136105 0312	284,-
	1126		1126	

## SARA® Threading die set

60°
HSS
DIN 22568
DIN 13 6g
i Vc/fz
408

- For ISO metric thread, DIN 13
- Closed, pre-slotted shape
- Tolerance zone 6g
- **Cutting material: HSS**
- In a steel case

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/EPF/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	○	●	○							○		○				

Contents	art.no.	€
HSS threading die M3-4-5-6-8-10-12 incl. threading die holders (1 of each)	139120 0002	68,70
	1158	



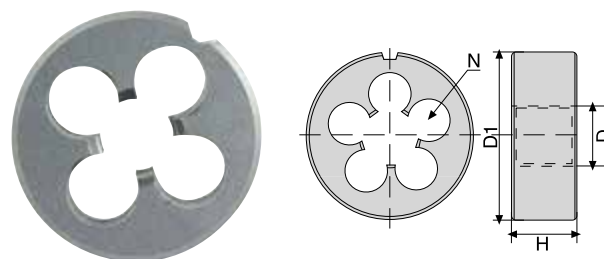
139120 0002

# ATORN® SARA® Threading dies

MF 60° HSS DIN EN 22568 DIN 13 6g *i* Vc/tz 408

- For ISO fine-pitch metric thread, DIN 13
- Closed, pre-slotted shape
- From M3 with two-sided spiral point for clean and easy chip removal in the cutting direction
- Tolerance zone 6g, M2 x 0.25 = 6h, without spiral point
- **Cutting material: HSS**
- \* Without spiral point

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	○		○	○							○		○					



		ATORN®					SARA®	
D mm	Pitch mm	D1 mm	H mm	N	art.no.	€	art.no.	€
M 2*	0.25	16	5	4	136015 0001	71,20		
M 3	0.35	20	5	4	136015 0006	49,90	136016 0006	33,40
M 4	0.35	20	5	4	136015 0008	49,30	136016 0008	37,40
M 5	0.5	20	5	4	136015 0010	36,70	136016 0010	25,90
M 6	0.5	20	5	4	136015 0011	36,70	136016 0011	25,90
M 6	0.75	20	7	4	136015 0012	28,20	136016 0012	22,30
M 7	0.75	25	9	4	136015 0013	41,30	136016 0013	29,20
M 8	0.5	25	9	5	136015 0014	49,40	136016 0014	34,90
M 8	0.75	25	9	4	136015 0015	31,60	136016 0015	23,50
M 8	1.0	25	9	4	136015 0016	31,60	136016 0016	23,30
M 9	1.0	25	9	5	136015 0018	43,70	136016 0018	32,70
M 10	0.75	30	11	5	136015 0020	52,90	136016 0020	40,70
M 10	1.0	30	11	5	136015 0021	37,70	136016 0021	27,90
M 10	1.25	30	11	4	136015 0022	40,40	136016 0022	32,20
M 11	1.0	30	11	5	136015 0023	50,60	136016 0023	36,30
M 12	1.0	38	10	5	136015 0025	49,40	136016 0025	37,-
M 12	1.25	38	10	4	136015 0026	52,50	136016 0026	40,70
M 12	1.5	38	10	4	136015 0027	45,70	136016 0027	33,70
M 14	1.0	38	10	5	136015 0031	49,40	136016 0031	38,50
M 14	1.25	38	10	5	136015 0032	51,70	136016 0032	41,30
M 14	1.5	38	10	5	136015 0033	45,70	136016 0033	33,70
M 15	1.0	38	10	5	136015 0034	66,40	136016 0034	42,-
M 16	1.0	45	14	5	136015 0036	68,60	136016 0036	55,-
M 16	1.5	45	14	5	136015 0037	62,10	136016 0037	45,80
M 18	1.0	45	14	5	136015 0038	87,10	136016 0038	68,40
M 18	1.5	45	14	5	136015 0039	62,10	136016 0039	45,80
					1126		1158	

		ATORN®					SARA®	
D mm	Pitch mm	D1 mm	H mm	N	art.no.	€	art.no.	€
M 20	1.0	45	14	6	136015 0041	87,10	136016 0041	68,40
M 20	1.5	45	14	6	136015 0042	62,10	136016 0042	45,80
M 20	2.0	45	14	6	136015 0043	92,60	136016 0043	70,90
M 22	1.0	55	16	6	136015 0044	117,50	136016 0044	93,-
M 22	1.5	55	16	6	136015 0045	84,50	136016 0045	62,70
M 22	2.0	55	16	5	136015 0046	124,50	136016 0046	85,80
M 24	1.0	55	16	6	136015 0047	117,50	136016 0047	85,80
M 24	1.5	55	16	6	136015 0048	84,50	136016 0048	62,70
M 24	2.0	55	16	6	136015 0049	114,50	136016 0049	86,30
M 25	1.5	55	16	6	136015 0051	125,-	136016 0051	98,20
M 26	1.5	55	16	6	136015 0052	99,10	136016 0052	79,70
M 27	2.0	65	18	6	136015 0055	169,50	136016 0055	124,50
M 28	1.5	65	18	6	136015 0057	125,50	136016 0057	98,20
M 30	1.5	65	18	6	136015 0060	125,50	136016 0060	100,50
M 30	2.0	65	18	6	136015 0061	169,50	136016 0061	108,-
M 32	1.5	65	18	7	136015 0062	155,50	136016 0062	109,-
M 33	2.0	65	18	7	136015 0065	175,-	136016 0065	133,-
M 34	1.5	65	18	7	136015 0066	177,-	136016 0066	133,-
M 35	1.5	65	18	8	136015 0067	169,-	136016 0067	127,50
M 36	1.5	65	18	8	136015 0068	163,-	136016 0068	120,50
M 36	2.0	65	18	8	136015 0069	175,-	136016 0069	136,-
M 36	3.0	65	25	7	136015 0070	203,-	136016 0070	136,-
M 40	1.5	75	20	8	136015 0075	249,-		
M 42	1.5	75	20	8	136015 0078	249,-		
M 45	1.5	90	22	7	136015 0082	331,-		
M 50	1.5	90	22	8	136015 0088	331,-		
					1126		1158	

## ATORN® Left-hand threading die

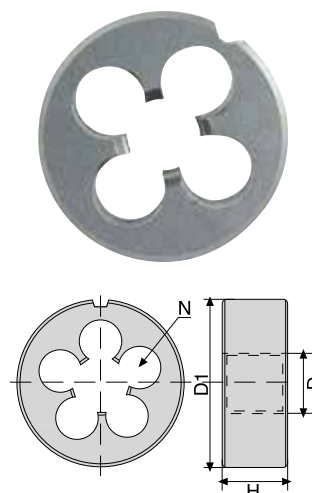
MF-LH 60° HSS DIN EN 22568 DIN 13 6g *i* Vc/tz 408

- For left-hand ISO fine-pitch metric thread, DIN 13
- Closed, pre-slotted shape
- With two-sided spiral point for clean and easy chip removal in the cutting direction
- Tolerance zone 6g
- **Cutting material: HSS**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		●	○		○	○						○		○					

D mm	Pitch mm	D1 mm	H mm	N	art.no.	€
M 8-LH	0.75	25	9	4	136025 0009	69,20
M 8-LH	1.0	25	9	4	136025 0010	54,50
M 10-LH	1.0	30	11	5	136025 0015	65,10
M 12-LH	1.5	38	10	4	136025 0019	78,40
M 14-LH	1.5	38	10	4	136025 0020	78,40
M 16-LH	1.5	45	14	4	136025 0022	107,-
M 20-LH	1.5	45	14	5	136025 0025	107,-

1126



## ATORN® Threading dies

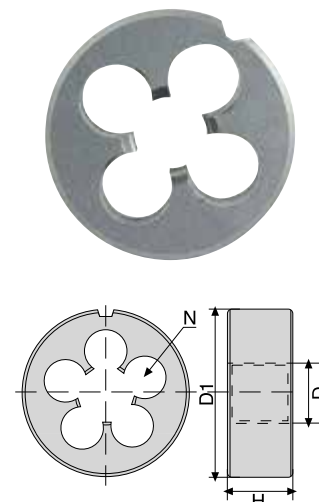
MF 60° HSS-E DIN EN 22568 DIN 13 6g *i* Vc/tz 408

- For metric ISO fine threads DIN 13
- Closed, pre-slotted shape
- With two-sided spiral point for clean and easy chip removal in the cutting direction
- Tolerance field 6g
- **Cutting material HSS-E** (lapped and nitrided)

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		●	●	○	●	○						○		○					

D mm	Pitch mm	D1 mm	H mm	N	art.no.	€
M 5	0.5	20	5	4	136020 0010	54,-
M 6	0.75	20	7	4	136020 0012	48,30
M 8	0.75	25	9	4	136020 0015	54,20
M 10	1.0	30	11	5	136020 0021	58,80
M 12	1.0	38	10	5	136020 0025	77,10
M 12	1.5	38	10	5	136020 0027	73,50
M 14	1.5	38	10	5	136020 0033	73,50
M 16	1.5	45	14	5	136020 0037	100,50
M 18	1.5	45	14	5	136020 0039	100,50
M 20	1.5	45	14	6	136020 0042	100,50
M 22	1.5	55	16	6	136020 0045	142,50
M 24	1.5	55	16	6	136020 0048	142,50
M 30	1.5	65	18	6	136020 0060	204,-

1126



## ATORN® Threading dies

BSW G 55° HSS DIN EN 22568 *i* Vc/tz 408

- for BS 84 Whitworth threads or DIN/EN/ISO 228 part 1 Whitworth pipe threads
- Closed, pre-slotted shape
- From 1/8" with two-sided spiral point for clean and easy chip removal in the cutting direction
- **Cutting material: HSS**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	○		○	○							○		○					

### BS 84 Whitworth thread, medium tolerance zone

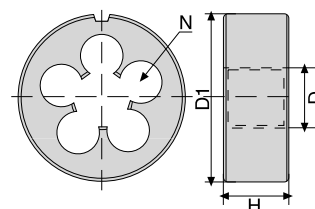
D	Pitch TPI	D1 mm	H mm	N	art.no.	€
BSW 1/8"	40	20	5	3	136035 0003	49,40
BSW 5/32"	32	20	7	4	136035 0004	57,-
BSW 7/32"	24	20	7	4	136035 0006	58,20
BSW 1/4"	20	20	7	4	136035 0007	43,80
BSW 5/16"	18	25	9	4	136035 0008	48,60
BSW 3/8"	16	30	11	4	136035 0009	59,-
BSW 1/2"	12	38	14	4	136035 0011	77,10
BSW 5/8"	11	45	18	4	136035 0013	98,70

1126

### Whitworth pipe thread, DIN/EN/ISO 228 part 1 in tolerance zone A

D	Pitch TPI	D1 mm	H mm	N	art.no.	€
G 1/8"	28	30	11	5	136040 0001	43,90
G 1/4"	19	38	10	5	136040 0002	43,90
G 3/8"	19	45	14	5	136040 0003	58,60
G 1/2"	14	45	14	6	136040 0004	58,60
G 3/4"	14	55	16	6	136040 0006	91,20
G 1"	11	65	18	7	136040 0008	128,-
G 1 1/2"	11	90	22	8	136040 0012	295,-
G 2"	11	105	22	9	136040 0014	370,-

1126



## ATORN® Threading dies

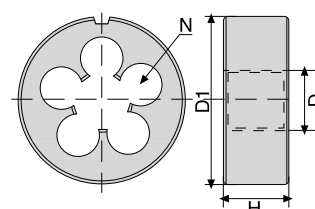
UNF 60° HSS DIN EN 22568 *i* Vc/tz 408

- For UNF (American unified national standard fine-pitch) threads
- Closed, pre-slotted shape
- From no. 5 with two-sided spiral point for clean and easy chip removal in the cutting direction
- **Cutting material: HSS**
- Note: For cutting true-to-gauge threads in tolerance zone 2A
- \* Without spiral point

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	○		○	○							○		○					

D	D1 mm	H mm	Pitch TPI	N	art.no.	€
UNF No. 4*	16	5	48	4	136050 0005	50,70
UNF No. 6	20	7	40	4	136050 0007	49,60
UNF No. 8	20	7	36	4	136050 0008	48,30
UNF No. 10	20	7	32	4	136050 0009	48,30
UNF No. 12	20	7	28	4	136050 0010	51,70
UNF 1/4"	20	7	28	4	136050 0011	47,40
UNF 5/16"	25	9	24	4	136050 0012	53,30
UNF 3/8"	30	11	24	4	136050 0013	64,50
UNF 7/16"	30	11	20	5	136050 0014	64,50
UNF 1/2"	38	10	20	5	136050 0015	80,60
UNF 9/16"	38	10	18	5	136050 0016	87,50
UNF 5/8"	45	14	18	5	136050 0017	106,50

1126



## SARA® Thread cutting tool set, M3 - M12

M
60°
HSS
DIN 352
ISO 2 6H  
DIN 136g

- In a steel case**
- Contents: 1 set of DIN 352 hand taps for each size, M3-4-5-6-8-10-12, 3 pcs per set  
 1 threading die DIN 223/EN 22568, M3-4-5-6-8-10-12 in each size:  
 1 adjustable tap wrench in sizes 1 + 2  
 1 threading die holder (DIN 225) in each size: 20x5, 20x7, 25x9, 30x11, 38x14  
 1 of each core drill (roll-milled) Ø 2.5 | 3.3 | 4.2 | 5.0 | 6.8 | 8.5 | 10.2 mm  
 Thread pitch gauge and screw extractor
- Cutting material: HSS**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●										○		○					

Contents		art.no.	€
Thread cutting tools M3 - M12		137120 0012	311,-
		1158	



## SARA® Thread cutting tool set, M3 - M20

M
60°
HSS
DIN 352
ISO 2 6H  
DIN 136g

- In a steel case**
- Contents: 1 set of DIN 352 hand taps for each size, M3-4-5-6-8-10-12-14-16-18-20, 3 pcs per set  
 1 threading die DIN 223/EN 22568, M3-4-5-6-8-10-12-14-16-18-20 in each size:  
 1 adjustable tap wrench in sizes 1 + 3  
 1 threading die holder in each size: 20x5, 20x7, 25x9, 30x11, 38x14, 45x18  
 Thread pitch gauge + screwdriver
- Cutting material: HSS**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●										○		○					

Contents		art.no.	€
Thread cutting tools M3 - M20		137130 0020	619,-
		1158	



**SARA® Single operation tap set, M3 - M12**



- For metric threads, M3 - M12
- DIN 338 tapping hole twist drill bit
- Tap wrench
- In a steel case
- Cutting material: HSS

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	○	○								○		○					



Contents	art.no.	€
Single operation tap DIN 352: M 3-4-5-6-8-10-12 (1 of each), 1 tap wrench DIN 1814 size 1 1/2 adjustable, Twist drill bit DIN 338 roll-milled: 2.5 3.3 4.2 5.0 6.8 8.5 10.2 mm (1 of each)	150140 0063	99,70

1133

**YOUR DRILL**

**GIVES UP.** • **WHAT DO YOU DO? YOU REACH**

**FOR A NEW ONE**

**AND SIMPLY CARRY ON:**

**SARA® GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE



## SARA® Machine tap extensions

- **Threading in workpieces with extremely deep female threads or for threading directly along cast walls, edges, interfering edges of equipment etc.**
- The front end of the extension is designed as a collet. Tightening a knurled clamping nut will clamp the collet and/or the tap. Torque is transferred via the square end. The rear end of the extension is DIN-compliant so that the tap extensions can be clamped in quick-change inserts just like taps or other thread-cutting equipment.
- **Special dimensions available on request**
- For use on CNC machines and traditional threading attachments
- No cost-intensive taps with special lengths
- No spare parts required
- The extension and standard tap combination is precise and easy to handle



### Straight shank

Type	D1 mm	for quadratic mm	L7 mm	D3 mm	C mm	D4 mm	L4 mm	L mm	art.no.	€
TE1 / TE1IK	2.8	2.1	22	6	4.9	6.1	60	130	138002 0001	136,-
TE1L	2.8	2.1	22	6	4.9	6.1	70	230	138002 0002	151,-
TE2 / TE2IK	3.5	2.7	23	6	4.9	7.5	60	130	138002 0003	136,-
TE2L	3.5	2.7	23	6	4.9	7.5	70	230	138002 0004	151,-
TE3 / TE3IK	4.5	3.4	23	6	4.9	8.4	60	130	138002 0005	136,-
TE3L	4.5	3.4	23	6	4.9	8.4	70	230	138002 0006	151,-
TE4 / TE4IK	6	4.9	26	7	5.5	12.1	60	130	138002 0007	136,-
TE4L / TE4LIK	6	4.9	26	8	6.2	12.1	70	230	138002 0008	151,-
TE5 / TE5IK	7	5.5	26	8	6.2	12.1	60	130	138002 0009	139,50
TE5L / TE5LIK	7	5.5	26	8	6.2	12.1	70	230	138002 0010	154,-
TE6 / TE6IK	8	6.2	30	8	6.2	13	60	130	138002 0011	139,50
TE6L / TE6LIK	8	6.2	30	8	6.2	13	80	230	138002 0012	154,-
TE7 / TE7IK	9	7	31	10	8	15	60	130	138002 0013	139,50
TE7L / TE7LIK	9	7	31	10	8	15	80	230	138002 0014	154,-
TE8 / TE8IK	10	8	33	10	8	15	60	130	138002 0015	139,50
TE8L / TE8LIK	10	8	33	10	8	15	80	230	138002 0016	154,-
TE9 / TE9IK	11	9	36	12	9	18	90	130	138002 0017	151,-
TE9L / TE9LIK	11	9	36	12	9	18	90	230	138002 0018	163,-

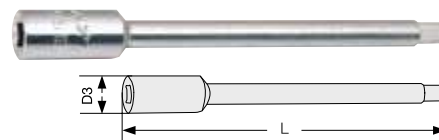
1166

Type	D1 mm	for quadratic mm	L7 mm	D3 mm	C mm	D4 mm	L4 mm	L mm	art.no.	€
TE10 / TE10IK	12	9	36	12	9	18	90	130	138002 0019	151,-
TE10L / TE10LIK	12	9	36	12	9	18	90	230	138002 0020	163,-
TE11 / TE11IK	14	11	40	14	11	22	90	200	138002 0021	248,-
TE11L / TE11LIK	14	11	40	14	11	22	90	330	138002 0022	273,-
TE12 / TE12IK	16	12	41	16	12	22	90	200	138002 0023	248,-
TE12L / TE12LIK	16	12	41	16	12	22	90	330	138002 0024	273,-
TE13 / TE13IK	18	14.5	43	18	14.5	26	100	200	138002 0025	265,-
TE13L / TE13LIK	18	14.5	43	18	14.5	26	100	330	138002 0026	294,-
TE14 / TE14IK	20	16	52	20	16	28	100	200	138002 0027	316,-
TE14L / TE14LIK	20	16	52	20	16	28	100	330	138002 0028	341,-
TE15 / TE15IK	22	18	55	22	18	30	100	200	138002 0029	321,-
TE15L / TE15LIK	22	18	55	22	18	30	100	330	138002 0030	365,-
TE16 / TE16IK	25	20	56	25	20	35	100	200	138002 0031	336,-
TE16L / TE16LIK	25	20	56	25	20	35	100	330	138002 0032	370,-
TE17 / TE17IK	28	22	58	28	22	40	100	200	138002 0033	360,-
TE17L / TE17LIK	28	22	58	28	22	40	100	330	138002 0034	385,-
TE18 / TE18IK	32	24	60	32	24	44	100	200	138002 0035	370,-
TE18L / TE18LIK	32	24	60	32	24	44	100	330	138002 0036	395,-

1166

## SARA® Hand tap extension

- For extending taps and other tools with square end in accordance with DIN 10
- DIN 377
- Hardened and ground



for quadratic mm	for tap M	L mm	D3 mm	art.no.	€
2.1	1 - 2.6	60	6	138015 0021	4,60
2.4		70	6	138015 0024	4,60
2.7	3	80	7	138015 0027	4,60
3.0	3.5	90	7	138015 0030	4,60
3.4	4	95	8	138015 0034	4,71
3.8		100	9	138015 0038	4,95
4.3		105	10	138015 0043	5,40
4.9	4.5 - 8	110	11	138015 0049	5,70
5.5	9 - 10	115	12	138015 0055	5,90
6.2	11	120	14	138015 0062	7,60

1158

for quadratic mm	for tap M	L mm	D3 mm	art.no.	€
7.0	12	125	15	138015 0070	7,90
8.0		125	17	138015 0080	8,85
9.0	13 - 16	130	19	138015 0090	9,85
10.0		140	21	138015 0100	11,15
11.0	18	150	23	138015 0110	13,-
12.0	20	155	25	138015 0120	14,10
14.5	22 - 24	175	29	138015 0145	22,10
16.0	27	180	30	138015 0160	26,60
18.0	30	200	33	138015 0180	29,90
20.0	33	220	33	138015 0200	39,10

1158

## SARA® ATORN® Tool holder with ratchet

- Two-jaw chuck with square holding fixture
- **All-steel design**, chrome-plated
- Especially suitable for thread cutting in areas that are difficult to access
- Long version (0250 and 0300)
- 138110 .... with ratchet and centering eye for perpendicular cutting



with centring lug



Long version

L mm	for quadratic mm	for tap M	SARA®		ATORN® <b>NEW</b>	
			art.no.	€	with centring lug art.no.	€
85	2.0 - 5.0	M 3 - M 10	138010 0085	10,55	138110 0085	13,45
250	2.0 - 5.0	M 3 - M 10	138010 0250	18,35	138110 0250	20,90
100	4.5 - 8.0	M 5 - M 12	138010 0100	14,40	138110 0100	18,85
300	4.5 - 8.0	M 5 - M 12	138010 0300	25,30	138110 0300	28,50
117	9.0 - 12.5	M 13 - M 20	138010 0117	89,-		

1158

1126

**ATORN® Tap wrench, adjustable****NEW****DIN 1814**

- Adjustable tap wrench in accordance with DIN 1814
- **Tool body made of zinc die-casting alloy with increased tensile strength**
- **Clamping jaws made of tool steel: precision-eroded and hardened**
- Up to 120% higher torque compared to conventional holding tools
- Handles refined by burnishing-nitriding process, can be unscrewed on one side
- Handle with working hole to increase leverage
- Guide slot for stabilising the jaw
- Holding of tools with square



No.	for quadratic mm	L mm	art.no.	€
0	2.0 - 5.0	125	<b>138120 0001</b>	<b>11,10</b>
1	2.0 - 6.0	180	138120 0002	<b>11,85</b>
1 1/2	2.5 - 8.0	200	138120 0003	<b>13,35</b>
2	4.0 - 9.0	280	138120 0004	<b>18,60</b>

1126

No.	for quadratic mm	L mm	art.no.	€
3	4.9 - 12.0	375	138120 0005	<b>26,50</b>
4	5.5 - 16.0	500	138120 0006	<b>46,40</b>
5	7.0 - 20.0	750	138120 0007	<b>77,30</b>
6	9.0 - 25.0	1000	138120 0008	<b>90,40</b>

1126

**ATORN® All-steel tap wrench with center eye****NEW****DIN 1814**

- Adjustable tap wrench in accordance with DIN 1814
- **High-strength tool body made of stainless steel with centring lug for perpendicular cutting**
- **Clamping jaws made of tool steel: precision-eroded and hardened**
- Handles refined by burnishing-nitriding process, can be unscrewed on one side
- Working hole to hold spindle toggle for maximum traction
- Holding of tools with square



No.	for quadratic mm	L mm	art.no.	€
0	2.0 - 5.0	125	<b>138121 0001</b>	<b>14,25</b>
1	2.0 - 6.0	180	138121 0002	<b>15,80</b>
1 1/2	2.5 - 8.0	200	138121 0003	<b>16,30</b>
2	4.0 - 9.0	280	138121 0004	<b>21,40</b>
3	4.9 - 12.0	375	138121 0005	<b>33,60</b>

1126

No.	for quadratic mm	L mm	art.no.	€
4	5.5 - 16.0	500	138121 0006	<b>50,90</b>
5	7.0 - 20.0	750	138121 0007	<b>80,40</b>
6	9.0 - 25.0	1000	138121 0008	<b>124,50</b>
7	16.0 - 32.0	1250	138121 0009	<b>181,50</b>
8	16.0 - 40.0	1250	138121 0010	<b>192,50</b>

1126

**SARA® Tap wrench, adjustable****DIN 352**

- DIN 1814
- Housing no. 0 - 5: high-purity die-cast zinc
- Housing no. 6: steel
- Jaws case-hardened
- Galvanised steel handles, one can be unscrewed
- For holding DIN 352 hand taps and DIN 206 hand reamers via square end



No.	for quadratic mm	L mm	art.no.	€
0	2.0 - 5.0	125	<b>138020 0001</b>	<b>5,15</b>
1	2.0 - 6.0	180	138020 0002	<b>5,90</b>
1 1/2	2.0 - 8.0	200	138020 0003	<b>5,90</b>
2	4.0 - 7.0	280	138020 0004	<b>9,20</b>

1158

No.	for quadratic mm	L mm	art.no.	€
3	4.9 - 12.0	375	138020 0005	<b>16,10</b>
4	5.5 - 16.0	480	138020 0006	<b>27,40</b>
5	7.0 - 20.0	700	138020 0007	<b>45,-</b>
6	9.0 - 25.0	960	138020 0008	<b>82,90</b>

1158

## SARA® Mini tap wrench, adjustable

- Hardened steel jaws
- For small threads
- Light and handy
- For delicate and precise work

D mm	for quadratic mm	for tap M	for tap Ww	art.no.	€
40	max. 2.4	M 1 - M 2.6	1/16" - 3/32"	<b>138025 0001</b>	<b>25,-</b>
1158					



## ATORN® Threading die holder

**NEW**
**DIN  
22568**

- For threading dies in accordance with DIN EN 22568 (DIN 225)
- **Tool body made of fine die-cast zinc in accordance with DIN 1743**
- Four attachment screws for small diameters, five screws for larger diameters
- Burnished attachment screws with a 90° pointed tip, for centring in the threading die
- Handles refined by burnishing-nitriding process with fine knurling for increased grip
- **Revised support structure for increased load capacity**

D mm	H mm	suitable for threading die	L mm	art.no.	€
16	5	M 1 - 2.6	160	<b>138130 0001</b>	<b>3,97</b>
20	5	M 3 - 4	195	138130 0002	<b>3,97</b>
20	7	M 4.5 - 6	195	138130 0003	<b>3,97</b>
25	9	M 7 - 9	215	138130 0004	<b>4,43</b>
30	11	M 10 - 11	260	138130 0005	<b>6,55</b>
38	10	MF 12 - 15	315	138130 0016	<b>8,95</b>
38	14	M 12 - 14	315	138130 0006	<b>8,95</b>

1126

**Reinforced version**


D mm	H mm	suitable for threading die	L mm	art.no.	€
45	14	MF 16 - 20	445	138130 0014	<b>13,85</b>
45	18	M 16 - 20	445	138130 0007	<b>13,85</b>
55	16	MF 22 - 26	495	138130 0012	<b>18,95</b>
55	22	M 22 - 24	495	138130 0008	<b>18,95</b>
65	18	MF 27 - 36	630	138130 0017	<b>23,80</b>
65	25	M 27 - 36	630	138130 0009	<b>23,80</b>

1126

## SARA® Threading die holder

**DIN  
22568**

- Housing Ø 16 - 65 mm high-purity die-cast zinc
- Housing from Ø 75 mm: steel
- Handles can be unscrewed
- For holding DIN 223/EN 22568 threading dies

D mm	H mm	suitable for threading die	L mm	art.no.	€
16	5	M 1-2.6	160	<b>138030 0001</b>	<b>3,25</b>
20	5	M 3   4	180	138030 0002	<b>3,25</b>
20	7	M 4.5-6	180	138030 0003	<b>3,25</b>
25	9	M 7-9	210	138030 0004	<b>3,69</b>
30	11	M 10-11	270	138030 0005	<b>5,45</b>
38	14	M 12-14	310	138030 0006	<b>7,50</b>
45	18	M 16-20	440	138030 0007	<b>11,50</b>

1158



D mm	H mm	suitable for threading die	L mm	art.no.	€
45	14	MF 16-20	440	138030 0014	<b>11,50</b>
55	22	M 22   24	490	138030 0008	<b>15,80</b>
55	16	MF 22   25	490	138030 0012	<b>15,80</b>
65	25	M 27   30   33   36	630	138030 0009	<b>19,85</b>
75	30	M 39   42	900	138030 0010	<b>67,20</b>
90	36	M 45   48   52	920	138030 0011	<b>83,40</b>

1158

## Overview of countersink and deburring tools

	Taper and deburring countersinks															
Sorting by countersink angle and number of cutting edges																
	Brand	ATORN®	ATORN®	BECK	BECK	ATORN®	ATORN®	SARA	BECK	BECK	BECK	BECK	ATORN®	ATORN®	SARA	
	Countersink angle	60°	60°	60°	60°	60°	75°	90°	90°	90°	90°	90°	90°	90°	90°	
	ISO	P M K N	P	P M K S N	P M K S N	P M K N H	P M K N	P M K S N	P M K S N	P M K S N H	P M K S N	P M K S N	P M K S	P M K N	P M K N	
	Diameter	6,3 - 25	25 - 63	6,3 - 25	6,3 - 25	8 - 25	8 - 25	6,3 - 31	4,3 - 31	4,3 - 31	6,3 - 31	6,3 - 31	10,4 - 31	4,3 - 40	4,3 - 40	
	Shank	Straight	MT	Straight	3F-shank	Straight	Straight	3F-shank	3F-shank	Straight	3F-shank	Straight	Straight/long	Straight	Straight	
	DIN	334C	334D	WN	WN	WN	WN	335C	335C	335C	335C	335C	335C	WN	335C	
	Number of cutting edges	3	3	3	3	3	3	3	3	3	3	3	3	4/5	3	
	Cutting material	HSS	HSS	HSS	HSS	Solid carbide	HSS	HSS	HSS	HSS	HSS	Solid carbide	HSS	HSS-E	HSS	
	Coating	bright/TiN		ZrN	ZrN			bright/TiN	ZrN	ZrN	ZrN	ZrN		bright/TiN/TiAlN		
	Type/info			EUC-Speed	EUC-Speed			ADVANCED	ADVANCED	EUC-Speed	EUC-Speed	EUC-Speed	ENORMplus			
	Item number	150130....	150135....	150174....	150175....	150133....	150140....	150270....	150170....	150172....	150171....	150173....	150163....	150101....	150201....	
	Page	315	315	315	315	316	316	317	321	321	321	321	321	319	318	318

	Taper and deburring countersinks											Flat countersinks	Combi countersinks
Sorting by countersink angle and number of cutting edges													
	Brand	SARA	ATORN®	SARA	ATORN®	ATORN®	SARA	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
	Countersink angle	90°	90°	90°	90°	90°	90°	100°	90°	90°	90°	180°	180°
	ISO	P M K N	P M K N	P M K N	P M K N	P M S N H	P M K N H	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N
	Diameter	4,3 - 31	5,3 - 31	5,3 - 31	6,3 - 31	6,3 - 25	4,3 - 25	6,3 - 25	20,5 - 80	5 - 50	10 - 35	6 - 20	7 - 66
	Shank	Straight	Straight	Straight	Straight	Straight	Straight	Straight	MT	Straight	Straight	Straight	Str. / MT
	DIN	335C	335C	335C	WN	335C	WN	WN	335D	WN	WN	373	WN
	Number of cutting edges	3	3	3	3	3	3	3	3	1	1	3	4
	Cutting material	HSS	HSS-E	HSS-E	HSS	HSS-E-PM	Solid carbide	HSS	HSS	HSS-E	HSS-E	HSS/HSS-E	HSS
	Coating	TiN					TiAlN				bright/TiN		
	Type/info				Extra long							Fine/medium	Model 0, 1, 2
	Item number	150205....	150111....	150211....	150104....	150108....	150166....	150109....	150115....	150155....	150145....	150501....	151010....
	Page	318	320	320	319	320	322	322	323	324	323	325	326





## ATORN® Taper and deburring countersinks

VHM Werks-norm 60° Z 3 *i* Vc/tz 413

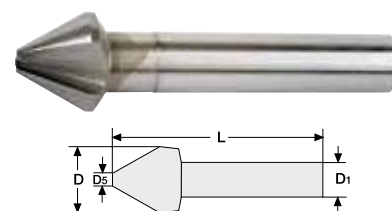
- 3 cutting edges, radially relief-ground
- Shank tolerance h9
- Straight shank
- **Cutting material: solid carbide**
- Design: Ø 8 mm in solid carbide, Ø 10 - 25 mm solid carbide head and soldered shank
- We recommend the carbide version for machining solid steels.

**Smooth countersinks, high endurance**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●		●	●				●	●	●	●	○		
		30-50	25-40	8-20	15-25	15-30		15-25	12-22				60-100	40-65	40-80	5-10	4-12		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D5 mm	D1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
8.0	2.0	6.0	50	0.07	<b>150133 0080</b>	<b>139,50</b>
10.0	2.5	8.0	50	0.08	150133 0100	139,-
12.5	3.2	8.0	56	0.10	150133 0125	152,-
16.0	4.0	10.0	63	0.14	150133 0160	204,-
20.0	5.0	10.0	67	0.16	150133 0200	236,-
25.0	6.3	10.0	71	0.18	150133 0250	264,-



1129

## ATORN® Taper and deburring countersinks

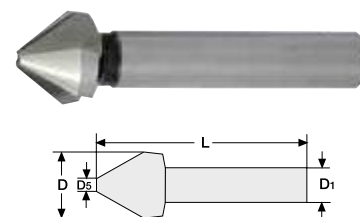
HSS Werks-norm 75° Z 3 *i* Vc/tz 412

- 3 cutting edges, straight shank
- Type C
- **Cutting material: HSS**
- Deburring countersinks also available with Morse taper shank and other countersink angles on request!

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	○		●	○		○	○				○	○	○				
		20-28	10-15		5-8	5-10		8-14	8-12				40-80	20-50	25-40				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D5 mm	D1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
8.0	2.0	6	50	0.06	<b>150140 0080</b>	<b>20,60</b>
10.0	2.5	6	54	0.09	150140 0100	21,60
12.5	2.8	8	54	0.12	150140 0125	24,10
15.0	3.2	8	56	0.12	150140 0150	33,10
20.0	3.5	10	63	0.16	150140 0200	50,-
25.0	3.8	10	71	0.16	150140 0250	56,-



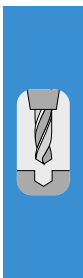
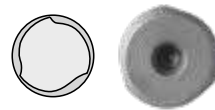
1129

**SARA® ADVANCED taper and deburring countersinks**

HSS
DIN 335C
90°
Z 3
TiN
Vc/fz
412

**Patented shank and irregular pitch**

- 3 cutting edges
- **HSS and HSS TiN cutting material**
- New cutting edge geometry prevents uneven wear of the cutting edges
- High degree of wear resistance and hot hardness for maximum service life
- High true running accuracy with considerably reduced force application
- **Patented shank to stop rotation of the countersink in the drill chuck with optimum torque transfer** (from Ø 8.3 mm)

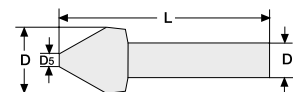
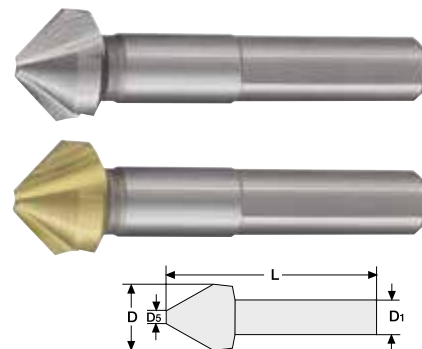


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	25-40	< 55 HRc	< 60 HRc	≥ 60 HRc		
		20-28	10-15	5-8	5-8	5-10	5-10	8-14	8-12			40-80	20-50						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Single**

D mm	D5 mm	D1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€	TiN art.no.	€
6.3	1.5	5	45	0.08	150270 0063	16,80	150271 0063	19,55
8.3	2	6	50	0.10	150270 0083	18,55	150271 0083	21,80
10.4	2.5	6	50	0.10	150270 0104	18,85	150271 0104	22,20
12.4	2.8	8	56	0.12	150270 0124	22,60	150271 0124	26,60
16.5	3.2	10	60	0.14	150270 0165	26,20	150271 0165	30,70
20.5	3.5	10	63	0.18	150270 0205	32,60	150271 0205	38,30
25	3.8	10	67	0.22	150270 0250	39,20	150271 0250	46,10
31	4.2	12	71	0.22	150270 0310	48,10	150271 0310	56,50
						1165	1165	



**Sets**

Contents	art.no.	€	TiN art.no.	€
6.3 / 8.3 / 10.4 / 12.4 / 16.5 / 20.5 mm	150270 1000	133,50	150271 1000	153,—
6.3 / 10.4 / 16.5 / 20.5 / 25 mm	150270 2000	131,50	150271 2000	155,—
		1165	1165	



150271 1000

# ATORN® SARA® Taper and deburring countersinks

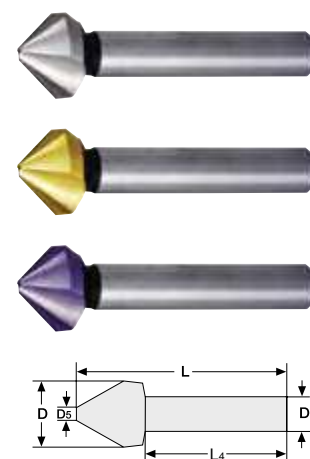
HSS
DIN 335C
Werks-norm
90°
Z 3
TiN
TiAlN
Vc/fz
412

- 3 cutting edges
- Radially relief-ground
- **Cutting material: HSS, HSS TiN, HSS TiAlN**
- For countersinking and deburring
- Countersunk Ø match the respective countersunk DIN screw heads (DIN 963, 964, 965, 966, 7991)



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	20-40	25-40		< 55 HRc	< 60 HRc	≥ 60 HRc
		● 20-28	● 10-15	○ 5-8	○ 5-8	○ 5-10	○ 5-10	○ 8-14	○ 8-12			○ 40-80	○ 20-50	○ 25-40					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



Individual						●	ATORN®	SARA®	ATORN®	SARA®	ATORN®							
D mm	D5 mm	D1 mm	L mm	L4 min. mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€	art.no.	€	TiN art.no.	€	TiN art.no.	€	TiAlN art.no.	€			
4.3	1.3	4	40	28	0.04	150101 0043	9,15	150201 0043	6,85	150105 0043	16,80	150205 0043	12,90	150107 0043	19,55			
5.0	1.5	4	40	28	0.04	150101 0050	9,45	150201 0050	6,85	150105 0050	16,80	150205 0050	12,90	150107 0050	19,55			
5.3	1.5	4	40	28	0.06	150101 0053	9,45	150201 0053	7,15	150105 0053	16,80	150205 0053	12,90	150107 0053	19,55			
5.8	1.5	5	45	28	0.06	150101 0058	9,45	150201 0058	7,15	150105 0058	16,80	150205 0058	12,90	150107 0058	19,55			
6.0	1.5	5	45	28	0.06	150101 0060	9,45	150201 0060	7,15	150105 0060	16,80	150205 0060	12,90	150107 0060	19,55			
6.3	1.5	5	45	28	0.06	150101 0063	9,45	150201 0063	7,15	150105 0063	15,60	150205 0063	12,90	150107 0063	19,55			
7.0	1.8	6	50	36	0.06	150101 0070	9,65	150201 0070	7,55	150105 0070	16,80	150205 0070	13,80	150107 0070	23,90			
7.3	1.8	6	50	36	0.06	150101 0073	9,65	150201 0073	7,55	150105 0073	16,80	150205 0073	13,80	150107 0073	24,60			
8.0	2.0	6	50	36	0.06	150101 0080	10,40	150201 0080	7,55	150105 0080	17,80	150205 0080	14,75	150107 0080	24,60			
8.3	2.0	6	50	36	0.09	150101 0083	10,40	150201 0083	7,55	150105 0083	17,80	150205 0083	14,75	150107 0083	24,60			
9.4	2.2	6	50	36	0.09	150101 0094	11,80	150201 0094	9,30	150105 0094	21,20	150205 0094	15,90	150107 0094	27,10			
10.0	2.5	6	50	36	0.09	150101 0100	11,40	150201 0100	9,30	150105 0100	20,20	150205 0100	16,70	150107 0100	27,10			
10.4	2.5	6	50	36	0.09	150101 0104	12,10	150201 0104	9,50	150105 0104	21,20	150205 0104	17,80	150107 0104	27,10			
11.5	2.8	8	56	36	0.09	150101 0115	12,55	150201 0115	10,-	150105 0115	22,20	150205 0115	18,75	150107 0115	28,-			
12.4	2.8	8	56	36	0.12	150101 0124	13,25	150201 0124	10,-	150105 0124	23,50	150205 0124	19,30	150107 0124	29,80			
13.4	2.9	8	56	36	0.12	150101 0134	14,90	150201 0134	11,30	150105 0134	25,80	150205 0134	22,-	150107 0134	32,20			
15.0	3.2	10	60	40	0.12	150101 0150	15,05	150201 0150	11,30	150105 0150	25,80	150205 0150	22,-	150107 0150	35,30			
16.5	3.2	10	60	40	0.16	150101 0165	16,-	150201 0165	12,35	150105 0165	26,80	150205 0165	23,-	150107 0165	36,50			
19.0	3.5	10	63	40	0.16	150101 0190	21,30	150201 0190	16,70	150105 0190	36,60	150205 0190	30,80	150107 0190	47,40			
20.5	3.5	10	63	40	0.16	150101 0205	21,50	150201 0205	16,90	150105 0205	41,10	150205 0205	32,60	150107 0205	48,10			
23.0	3.8	10	67	40	0.16	150101 0230	29,-	150201 0230	22,20	150105 0230	52,90	150205 0230	42,70	150107 0230	63,10			
25.0	3.8	10	67	40	0.16	150101 0250	30,60	150201 0250	23,20	150105 0250	54,-	150205 0250	43,10	150107 0250	73,30			
28.0	4.0	12	71	40	0.16	150101 0280	40,30	150201 0280	31,90					150107 0280	96,70			
30.0	4.2	12	71	40	0.16	150101 0300	40,50							150107 0300	99,20			
31.0	4.2	12	71	45	0.16	150101 0310	45,80	150201 0310	34,30	150105 0310	80,90	150205 0310	55,70	150107 0310	103,50			
40.0	10.0	15	75	40	0.16	150101 0400	67,60	150201 0400	64,70									
						1129			1168			1129			1168			1129



150110 0001



150112 0001



150112 0002



150114 0001

Sets

Contents	ATORN®		SARA®		ATORN®		SARA®		ATORN®	
	art.no.	€	art.no.	€	TiN art.no.	€	TiN art.no.	€	TiAlN art.no.	€
1 piece each 6.3   8.3   10.4   12.4   16.5   20.5 mm	150110 0001	82,40	150201 0001	60,60	150112 0001	155,-	150205 0001	107,50	150114 0001	182,50
1 piece each 10.4   16.5   20.5   25.0 mm	150110 0002	99,70			150112 0002	155,-				
1 piece each 8.0   10.0   11.5   15.0 mm	150110 0003	63,60			150112 0003	88,-				
	1129		1168		1129		1168		1129	

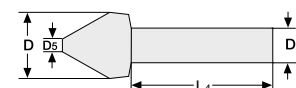
Extra-long shank, similar to DIN 335C

- 40, 50 and 63 mm diameters available on request



150102 0063

D mm	D5 mm	D1 mm	Feed f steel < 1000 N/mm² mm/rev	ATORN® L4 = 100 mm		ATORN® L4 = 150 mm	
				art.no.	€	art.no.	€
6.3	1.5	5	0.06	150104 0063	31,10	150102 0063	38,60
8.3	2.0	6	0.09	150104 0083	32,20	150102 0083	40,20
10.4	2.5	6	0.09	150104 0104	35,20	150102 0104	44,40
12.4	2.8	8	0.12	150104 0124	36,50	150102 0124	47,40
15.0	3.2	10	0.12	150104 0150	50,20	150102 0150	61,10
16.5	3.2	10	0.16	150104 0165	45,50	150102 0165	59,30
20.5	3.5	10	0.16	150104 0205	63,60	150102 0205	81,90
25.0	3.8	10	0.16	150104 0250	86,-	150102 0250	102,-
31.0	4.2	12	0.16	150104 0310	146,50	150102 0310	177,50
				1129		1129	



Sets, extra-long shank, similar to DIN 335C

Contents	ATORN® L4 = 100 mm		ATORN® L4 = 150 mm	
	art.no.	€	art.no.	€
1 piece each 6.3   8.3   10.4   12.4   16.5   20.5 mm	150116 0001	264,-	150113 0001	290,-
	1129		1129	



ATORN® ENORMplus deburring countersink

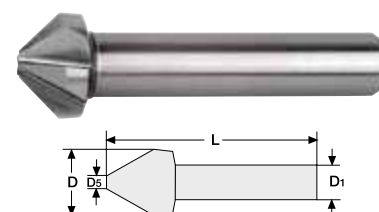
HSS-E    Werks-norm    90°    Z 4    Z 5    *i* Vc/tz    412

- Cutting material: HSS-E
- Application: especially for materials that are difficult to machine, such as Hardox 400, Creusabro, Inconel, Nimonic, Hastelloy, Monel, titanium and titanium alloys

material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
			< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRF/EP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
			● 8-14	● 8-14	● 6-12	● 10-15	● 10-17				● 7-12	● 8-15	● 5-12							

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D5 mm	D1 mm	L mm	Z	Feed f steel < 1400 N/mm² mm/rev	art.no.	€
10.4	4.0	6.0	50	4	0.03	150163 1040	56,-
12.4	4.0	8.0	56	5	0.03	150163 1240	62,20
16.5	4.5	10.0	60	5	0.04	150163 1650	77,90
20.5	5.0	10.0	63	5	0.05	150163 2050	108,-
25.0	5.5	10.0	67	5	0.06	150163 2500	158,-
31.0	6.0	12.0	71	5	0.06	150163 3100	199,50
						1129	



## ATORN® SARA® Taper and deburring countersinks

HSS-E
DIN 335C
Werks-norm
90°
Z 3
i Vc/fz
412

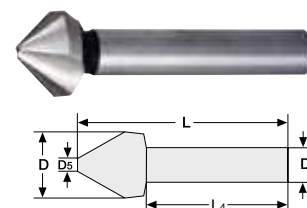
- 3 cutting edges
- Radially relief-ground
- **HSS-E cutting material**
- For countersinking and deburring
- Countersunk Ø match the respective countersunk DIN screw heads (DIN 963, 964, 965, 966, 7991)

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	○	●	●	○	○	○				○	○	○					
		20-28	10-15	5-8	5-8	5-10	5-10	8-14	8-12				40-80	20-50	25-40					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Single

D mm	D5 mm	D1 mm	L mm	L4 min. mm	Feed f steel < 1000 N/mm² mm/rev	ATORN® art.no.	€	SARA® art.no.	€
5.3	1.5	4	40	28	0.06	150111 0053	12,05	150211 0053	10,30
6.3	1.5	5	45	28	0.06	150111 0063	11,90	150211 0063	10,45
8.0	2.0	6	50	36	0.06	150111 0080	12,95	150211 0080	11,20
8.3	2.0	6	50	36	0.09	150111 0083	12,95	150211 0083	11,20
9.4	2.2	6	50	36	0.09	150111 0094	14,20	150211 0094	12,45
10.0	2.5	6	50	36	0.09	150111 0100	14,20	150211 0100	12,45
10.4	2.5	6	50	36	0.09	150111 0104	14,20	150211 0104	12,45
12.4	2.8	8	56	36	0.12	150111 0124	16,70	150211 0124	14,70
15.0	3.2	10	60	40	0.12	150111 0150	19,45	150211 0150	17,-
16.5	3.2	10	60	40	0.16	150111 0165	20,20	150211 0165	17,60
20.5	3.5	10	63	40	0.16	150111 0205	26,10	150211 0205	22,40
25.0	3.8	10	67	40	0.16	150111 0250	34,-	150211 0250	29,80
31.0	4.2	12	71	45	0.16	150111 0310	45,40	150211 0310	40,-
						1129		1168	



### Sets

Contents	ATORN® art.no.	€	SARA® art.no.	€
1 piece each 6.3   8.3   10.4   12.4   16.5   20.5 mm	150117 0001	99,70	150211 0001	89,40
	1129		1168	



## SARA® Taper and deburring countersinks

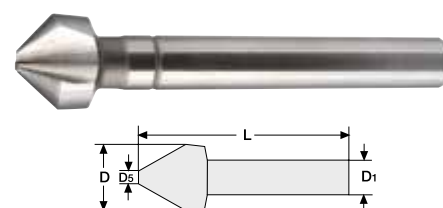
HSS-E PM
DIN 335C
90°
Z 3
i Vc/fz
412

- **Cutting material: HSS-E-PM**
- Radially relief-ground
- Diameter tolerance ±0.05 mm
- Shank tolerance h9

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○	●	●	○										●		
		6-10	6-10	6-10	4-8	4-8	4-8										5-12		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D5 mm	D1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	SARA® art.no.	€	
6.3	1.5	5	45	0.03	150108 0063	33,-	
8.3	2	6	50	0.04	150108 0083	41,80	
10.4	2.5	6	50	0.05	150108 0104	52,90	
12.4	2.8	8	56	0.08	150108 0124	57,-	
16.5	3.2	10	60	0.09	150108 0165	64,10	
20.5	3.5	10	63	0.09	150108 0205	88,50	
25	3.8	10	67	0.10	150108 0250	121,50	
						1165	



# BECK | Taper and deburring countersink EUC-Speed 90°

HSS
VHM
DIN 335C
Werks-norm
90°
Z 3
ZrN
Vc/fz
412
413

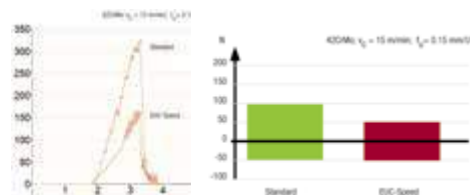
- Geometry with very unequal pitch (EU pitch)
- **High degree of smoothness**
- Precision design
- Prepared cutting edges
- Radially relief-ground
- **Reduced axial and radial forces**
- **Low vibration tendency**
- Special coating

**Shank tolerances:**

HSS h9  
Solid carbide h6 (suitable for hydraulic expansion and shrink fit chucks)

**Versions:**

- 150170 - HSS with straight shank, Tolerance h9
- 150171 - Solid carbide, Tolerance h6 (suitable for hydraulic expansion and shrink fit chucks)
- 150172 - HSS with 3 clamping surfaces on the shank to stop rotation of the countersink in the drill chuck with optimum torque transfer
- 150173 - HSS with extended straight shank, Tolerance h9



50% reduced axial force

25% reduced radial force



very unequal pitch



Standard Series  
4000 N/mm², v\_c = 15 m/min, f\_z = 0.15  
EUC-Speed  
optimised countersink

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
150170...	●	●	●	○	○	○		●	●	○			○		○					
150172...	○	●	●	○	○	○		●	●	○			○		○					
150173...	○	●	●	○	○	○		●	●	○			○		○					
150171...	○	●	●	○	○	○		●	●	○			○		○		○			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Individual**

D mm	D5 mm	D1 mm	L mm	Feed f steel < 700 N/mm² mm/rev	HSS with straight shank art.no.	€	HSS with 3-face shank art.no.	€	Solid carbide with straight shank art.no.	€
4.3	1.3	4	40	0.06	150170 0043	22,30	150172 0043	24,70		
6.3	1.5	5	45	0.08	150170 0063	24,20	150172 0063	26,90	150171 0063	117,50
8.3	2	6	50	0.10	150170 0083	26,90	150172 0083	29,40	150171 0083	127,50
10.4	2.5	6	50	0.10	150170 0104	27,40	150172 0104	29,80	150171 0104	133,-
12.4	2.8	8	56	0.12	150170 0124	32,80	150172 0124	35,70	150171 0124	139,-
16.5	3.2	10	60	0.14	150170 0165	37,80	150172 0165	40,40	150171 0165	170,50
20.5	3.5	10	63	0.18	150170 0205	47,-	150172 0205	49,60	150171 0205	195,-
25	3.8	10	67	0.18	150170 0250	56,60	150172 0250	59,20	150171 0250	226,-
31	4.2	12	71	0.22	150170 0310	69,30	150172 0310	72,60	150171 0310	268,-
						1165	1165	1165		



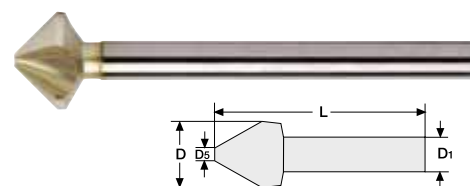
**Sets, 5-pcs.**

Contents	HSS with straight shank art.no.	€	HSS with 3-face shank art.no.	€
1 piece each 6.3   10.4   16.5   20.5   25 mm	150170 1000	185,-	150172 1000	198,-
	1165		1165	



**With extended shank**

D mm	D5 mm	D1 mm	L mm	Feed f steel < 700 N/mm² mm/rev	HSS art.no.	€
6.3	1.5	5	104	0.08	150173 0063	46,50
8.3	2	6	105	0.10	150173 0083	50,-
10.4	2.5	6	107	0.10	150173 0104	53,60
12.4	2.8	8	108	0.12	150173 0124	59,80
16.5	3.2	10	111	0.14	150173 0165	63,70
20.5	3.5	10	114	0.18	150173 0205	76,20
25	3.8	10	118	0.18	150173 0250	87,80
31	4.2	12	140	0.22	150173 0310	116,50
						1165





## SARA® Solid carbide deburring countersink

VHM Werks-norm 90° Z 3 TiAlN *i* Vc/tz 413

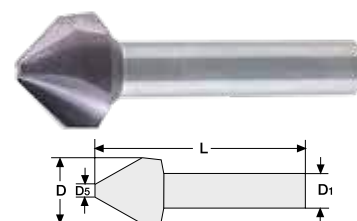
- 3 cutting edges, radially relief-ground
- **Cutting material: solid carbide TiAlN**
- Made entirely of solid carbide
- Countersunk Ø match the respective countersunk DIN screw heads (DIN 963, 964, 965, 966, 7991)

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		30-50	25-40	8-20	15-28	15-30		12-25	12-22			60-100	40-65	40-80	5-10	4-12		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D5 mm	D1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
4.3	1.5	4	40	0.05	<b>150166 0430</b>	<b>85,50</b>
6.3	2.0	5	45	0.06	150166 0630	88,-
8.3	2.0	6	50	0.07	150166 0830	92,60
10.4	2.5	6	50	0.08	150166 1040	96,20
12.4	2.8	8	56	0.08	150166 1240	102,-
16.5	3.2	10	60	0.14	150166 1650	106,50
20.5	3.5	10	63	0.16	150166 2050	128,-
25.0	3.8	10	67	0.18	150166 2500	167,50

1165



## ATORN® Taper and deburring countersinks

HSS Werks-norm 100° Z 3 *i* Vc/tz 412

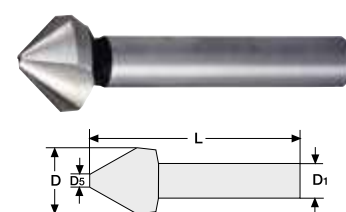
- 3 cutting edges
- Cutting material: HSS
- With straight shank

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		20-28	10-15	5-8	5-8	5-10	5-10	8-14	8-12			40-80	20-50	25-40				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D5 mm	D1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
6.3	1.5	5	44	0.06	<b>150109 0063</b>	<b>14,75</b>
8	2	6	49	0.06	150109 0080	15,80
10.4	2.5	6	49	0.09	150109 0104	18,75
12.4	2.8	8	55	0.12	150109 0124	19,65
16.5	3.2	10	59	0.16	150109 0165	27,10
20.5	3.5	10	62	0.16	150109 0205	39,40
25	3.8	10	65	0.16	150109 0250	44,10

1129



## ATORN® Taper and deburring countersinks

HSS
DIN 335D
90°
Z 3
Vc/tz
412

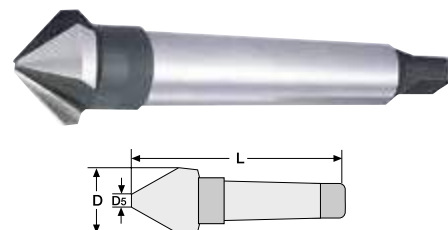
- 3 cutting edges
- Morse taper shank
- **Cutting material: HSS**
- Chatter-free countersinking and deburring

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		20-28	10-15		5-8	5-10	5-10	8-14	8-12				40-80	20-50	25-40				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D5 mm	Shank	L mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
20.5	3.5	MT 2	100	0.16	150115 0205	53,10
25.0	3.8	MT 2	106	0.16	150115 0250	54,60
28.0	4.0	MT 2	112	0.16	150115 0280	55,60
30.0	4.2	MT 2	112	0.16	150115 0300	57,30
31.0	4.2	MT 2	112	0.18	150115 0310	59,70
34.0	4.5	MT 2	118	0.18	150115 0340	64,50
37.0	4.8	MT 2	118	0.18	150115 0370	69,50
40.0	10.0	MT3	140	0.18	150115 0400	87,-
50.0	14.0	MT3	150	0.2	150115 0500	108,50
63.0	16.0	MT 4	180	0.2	150115 1630	178,50
80.0	22.0	MT 4	190	0.2	150115 1800	306,-

1129



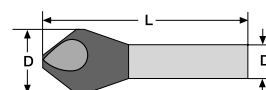
## ATORN® Taper and deburring countersinks

HSS-E
Werk-norm
90°
Z 1
TiN
Vc/tz
412

- With cross-hole and straight shank
- Chip removal due to slanted bore in the shank direction, light spiral point
- **Cutting material: HSS-E; HSS-E, TiN-coated**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		22-30	11-16	5-9	5-9	5-11	5-11	9-15	9-13				44-88	22-55	27-44				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



### Individual

D mm	for Ø mm	L mm	D1 mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€	TiN art.no.	€
10	2 - 5	45	6	0.04	150145 0025	10,25	150146 0025	16,80
14	5 - 10	56	6	0.08	150145 0510	13,40	150146 0510	21,20
21	10 - 15	67	10	0.11	150145 1015	25,40	150146 1015	32,40
28	15 - 20	90	12	0.15	150145 1520	50,80	150146 1520	71,70
35	20 - 25	106	15	0.16	150145 2025	73,80	150146 2025	106,-

1129

1129



150151 0001

### 5 pcs set

Contents	art.no.	€	TiN art.no.	€
D: 10 / 14 / 21 / 28 mm	150150 0001	96,70	150151 0001	147,50

1129

1129

## ATORN® Taper and deburring countersinks

HSS-E
Werks-norm
90°
Z 1
Vc/fz
412

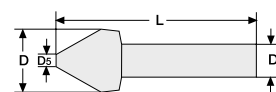
- With one cutting edge, large chip chamber, type A
- Axial-radial conical surface relief grinding
- Straight shank, from Ø 15 mm with offset shank
- **Cutting material: HSS-E**

**One cutting edge**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		22-30	11-16	5-9	5-9	5-11	5-11	9-15	9-13				44-88	22-55	27-44					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D5 mm	D1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
5	1	5	50	0.04	150155 0050	14,50
10	1	10	60	0.09	150155 0100	15,60
15	2	10	65	0.12	150155 0150	21,20
20	2	10	73	0.16	150155 0200	29,80
25	2	10	80	0.16	150155 0250	45,80
30	3	12	82	0.16	150155 0300	74,80
40	3	12	92	0.16	150155 0400	96,70
50	3	12	100	0.16	150155 0500	155,-



1129

## SARA® 90° countersink bits

HSS
DIN 335C
90°
Z 3

- **Deburring, chamfering and countersinking**
- DIN 335 Form C
- Bit shank drive DIN 3126
- **Form C 6.3** hexagonal connector, 6.35 mm (1/4")
- 3 cutting edges



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●										●	○	○					

### Single

D mm	for thread	Total length mm	art.no.	€
6.3	M3	31	150140 0083	9,45
8.3	M4	31	150140 0104	9,55
10.4	M5	34	150140 0124	10,90
12.4	M6	35	150140 0165	12,35
16.5	M8	40	150140 0205	13,55
20.5	M10	41	150141 0001	15,50

1133

### 8-pcs. set

Contents	art.no.	€
In plastic box: 6.3-8.3-10.4-12.4-16.5-20.5 mm incl. handle, bit holder and cutting paste	150130 0001	81,20

1133



## SARA® 90° hand-held deburring tool

HSS
90°
Z 3

- Right-hand cutting

D mm	art.no.	€
12.4	150103 0124	16,90
16.5	150103 0165	19,75
20.5	150103 0205	25,20
25.0	150103 0250	31,60

1133



# ATORN® Counterbores

HSS
HSS-E
DIN 373

Z 3

- 3 cutting edges
- Spiral-fluted
- With straight shank
- Fixed pilot pin
- For countersinks in accordance with DIN 74 part 2, type H, J, K
- For screws according to DIN 912, DIN 6912, DIN 6984 and DIN 84
- **Cutting material: HSS-E, HSS-E**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		30	20	10	10	10		15	15				80	70	40					

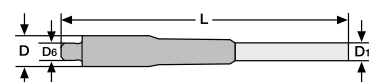
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## With through-hole pin, fine-grade

D mm	D6 mm	for screws	D1 mm	L mm	HSS		HSS-E	
					art.no.	€	art.no.	€
6.0	3.2	M3	5.0	71	150501 0001	16,40		
6.5	3.2	M3	5.0	71			150506 0001	23,90
8.0	4.3	M4	5.0	71	150501 0003	13,15	150506 0003	21,60
10.0	5.3	M5	8.0	80	150501 0005	14,25	150506 0005	24,50
11.0	6.4	M6	8.0	80	150501 0007	15,40	150506 0007	27,20
15.0	8.4	M8	12.5	100	150501 0009	24,70	150506 0009	35,50
18.0	10.5	M10	12.5	100	150501 0011	29,40	150506 0011	42,40
20.0	13.0	M12	12.5	100	150501 0013	31,50	150506 0013	45,70

1129

1129

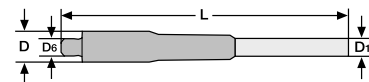


## With through-hole pin, medium-grade

D mm	D6 mm	for screws	D1 mm	L mm	HSS		HSS-E	
					art.no.	€	art.no.	€
6.0	3.4	M3	5.0	71	150501 0002	16,40		
6.5	3.4	M3	5.0	71			150506 0002	23,90
8.0	4.5	M4	5.0	71	150501 0004	13,15	150506 0004	21,60
10.0	5.5	M5	8.0	80	150501 0006	14,25	150506 0006	24,50
11.0	6.6	M6	8.0	80	150501 0008	15,40	150506 0008	27,20
15.0	9.0	M8	12.5	100	150501 0010	24,70	150506 0010	35,50
18.0	11.0	M10	12.5	100	150501 0012	29,40	150506 0012	42,40
20.0	13.5	M12	12.5	100	150501 0014	31,50	150506 0014	45,70

1129

1129

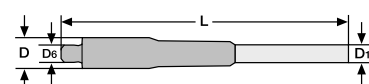


## With tapping hole pin

D mm	D6 mm	for screws	D1 mm	L mm	HSS		HSS-E	
					art.no.	€	art.no.	€
6	2.5	M3	5.0	71	150505 0006	17,30		
6.5	2.5	M3	5.0	71			150507 0006	25,40
8.0	3.3	M4	5.0	71	150505 0008	15,70	150507 0008	23,60
10.0	4.2	M5	8.0	80	150505 0010	15,25	150507 0010	27,20
11.0	5.0	M6	8.0	80	150505 0011	16,20	150507 0011	29,20
15.0	6.8	M8	12.5	100	150505 0015	25,30	150507 0015	37,80
18.0	8.5	M10	12.5	100	150505 0018	29,80	150507 0018	45,70
20.0	10.2	M12	12.5	100	150505 0020	33,80	150507 0020	49,20

1129

1129



## Sets

- Contents: 1 unit each Counterbore for screws M3-M10 = 6-part

Description	HSS		HSS-E	
	art.no.	€	art.no.	€
Through-hole, fine-grade	150511 0002	129,50	150512 0002	187,-
Through-hole, medium-grade	150511 0003	130,50	150512 0003	187,-
Tapping hole	150511 0001	136,-	150512 0001	197,-

1129

1129

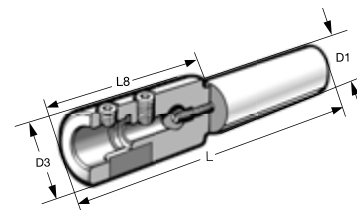


150511 0002

**GRANLUND Tools** **Combination counterbores**

HSS Werks-norm 22° Z 4

- Just 3 holder sizes required to cover a countersink range of 7 - 66 mm (on request up to 84 mm).
- Any countersink and pilot pin combination possible within the same holder size.
- Tight bore and shank tolerances ensure a high degree of true-running accuracy.
- Countersink and pin are fastened quickly and securely with just one screw. An additional stud safety catch prevents countersinks from twisting.
- Combine elements to produce countersinks for DIN screws and to machine stepped bores or non-standard countersinks
- 4 cutting edges



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○	●	●		○	○				○	○	○			
		15-30	10-25	5-20	10-20	10-20		20-40	20-40				70-150	70-120	30-60			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Combination counterbore holder**

Model	D1 mm	Shank	Countersink area mm	L mm	D3 mm	L8 mm	Hole H7 mm	art.no.	€
0	10x50		7-16.5	92	18	42	10	<b>150005 0001</b>	<b>130,50</b>
0		MT 1	7-16.5	111	18	42	10	150005 0002	139,50
0		MT 2	7-16.5	132	18	57	10	150005 0008	137,-
1	12x65		14-27.5	120	24	55	14	150005 0003	139,50
1		MT 1	14-27.5	123	24	55	14	150005 0004	149,-
1		MT 2	14-27.5	137	24	55	14	150005 0009	141,50
2		MT 2	24-66	155	34.5	75	22	150005 0005	204,-
2		MT3	24-66	174	34.5	75	22	150005 0006	193,-

1130



150005 0008

150005 0003



151001 0001



151001 0002



151001 0003

**Combination counterbore sets**

Model	Contents, piloted counterbore	Contents, pilot pin	Holder	art.no.	€
0P M4-M8	8.0 / 9.0 / 10.0 / 11.0 / 12.0 / 13.0 / 14.0 / 15.0	4.5 / 5.0 / 5.5 / 6.0 / 6.5 / 6.6 / 7.0 / 7.5 / 8.0 / 8.5 / 9.0 / 10.0	Model 0, MT 2	<b>151001 0001</b>	<b>839,-</b>
1P M8-M14	14.0 / 15.0 / 16.0 / 18.0 / 20.0 / 22.0 / 24.0	8.0 / 8.5 / 9.5 / 10.0 / 10.5 / 11.0 / 11.5 / 12.0 / 12.5 / 13.0 / 13.5 / 14.0 / 14.5 / 15.0 / 15.5 / 16.0	Model 1, MT 2	151001 0002	1.019,-
2P M14-M24	24.0 / 26.0 / 28.0 / 30.0 / 32.0 / 33.0 / 34.0 / 36.0 / 40.0	13.0 / 14.0 / 15.0 / 16.0 / 17.0 / 18.0 / 19.0 / 20.0 / 23.0 / 24.0 / 25.0 / 26.0	Model 2, MT 3	151001 0003	1.869,-

1130

**Counterbore model 0**

- Countersink range 7 - 16.5 mm
- Cutting length 19 mm
- Shank Ø 10 mm



D mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
7.0	0.1	<b>151010 0070</b>	<b>59,-</b>
7.5	0.1	151010 0075	65,-
8.0	0.1	151010 0080	58,30
8.5	0.1	151010 0085	64,20
9.0	0.1	151010 0090	58,30
9.5	0.1	151010 0095	64,20
10.0	0.1	151010 0100	56,30
10.5	0.1	151010 0105	63,-
11.0	0.1	151010 0110	58,30
11.5	0.1	151010 0115	64,50

1130

D mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
12.0	0.1	151010 0120	59,-
12.5	0.1	151010 0125	65,50
13.0	0.1	151010 0130	64,20
13.5	0.1	151010 0135	74,-
14.0	0.2	151010 0140	64,20
14.5	0.2	151010 0145	74,10
15.0	0.2	151010 0150	65,10
15.5	0.2	151010 0155	74,80
16.0	0.2	151010 0160	68,60
16.5	0.2	151010 0165	79,80

1130

**Pilot pin, hardened and ground, model 0**

- Fixed pilot pin
- Total length 59 mm
- Shank Ø 4 mm



D mm	art.no.	€
4.0	<b>151025 0040</b>	<b>19,45</b>
4.5	151025 0045	23,-
5.0	151025 0050	23,-
5.5	151025 0055	23,-
6.0	151025 0060	23,-
6.5	151025 0065	23,-
7.0	151025 0070	23,-
7.5	151025 0075	23,-
8.0	151025 0080	23,40
8.5	151025 0085	23,40
9.0	151025 0090	23,40
9.5	151025 0095	23,40
10.0	151025 0100	23,40
10.5	151025 0105	23,40
11.0	151025 0110	23,40
11.5	151025 0115	23,40

1130

**Counterbore model 1**

- Countersink range 14 - 27.5 mm
- Cutting length 22 mm
- Shank Ø 14 mm



D mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
14.0	0.2	<b>151015 0140</b>	<b>64,70</b>
14.5	0.2	151015 0145	73,10
15.0	0.2	151015 0150	64,70
15.5	0.2	151015 0155	73,90
16.0	0.2	151015 0160	68,20
16.5	0.2	151015 0165	79,20
17.0	0.2	151015 0170	71,20
17.5	0.2	151015 0175	79,70
18.0	0.2	151015 0180	73,70
18.5	0.2	151015 0185	86,40
19.0	0.2	151015 0190	82,-
19.5	0.2	151015 0195	91,50
20.0	0.2	151015 0200	82,-
20.5	0.2	151015 0205	94,-

1130

D mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
21.0	0.2	151015 0210	83,60
21.5	0.2	151015 0215	97,90
22.0	0.2	151015 0220	86,50
22.5	0.2	151015 0225	98,10
23.0	0.2	151015 0230	97,-
23.5	0.2	151015 0235	103,50
24.0	0.3	151015 0240	97,-
24.5	0.3	151015 0245	107,-
25.0	0.3	151015 0250	97,-
25.5	0.3	151015 0255	108,50
26.0	0.3	151015 0260	104,-
26.5	0.3	151015 0265	110,50
27.0	0.3	151015 0270	106,-
27.5	0.3	151015 0275	113,-

1130

**Pilot pin, hardened and ground, model 1**

- Fixed pilot pin
- Total length 79 mm
- Shank Ø 6 mm



D mm	art.no.	€
7.0	<b>151030 0070</b>	<b>21,80</b>
7.5	151030 0075	21,80
8.0	151030 0080	21,80
8.5	151030 0085	21,80
9.0	151030 0090	21,80
9.5	151030 0095	21,80
10.0	151030 0100	21,80
10.5	151030 0105	23,-
11.0	151030 0110	23,-
11.5	151030 0115	23,-
12.0	151030 0120	23,-
12.5	151030 0125	23,90
13.0	151030 0130	26,50
13.5	151030 0135	26,50
14.0	151030 0140	26,70
14.5	151030 0145	26,70
15.0	151030 0150	26,70
15.5	151030 0155	26,70
16.0	151030 0160	26,70
16.5	151030 0165	26,70
17.0	151030 0170	26,70
17.5	151030 0175	26,70
18.0	151030 0180	27,30

1130

Continued on next page &gt;&gt;&gt;



**Counterbore model 2**

- Countersink range 24 - 66 mm
- Cutting length 27 mm
- Shank Ø 22mm



D mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
24.0	0.3	<b>151020 0240</b>	<b>119,-</b>
24.5	0.3	151020 0245	127,50
25.0	0.3	151020 0250	128,50
25.5	0.3	151020 0255	138,-
26.0	0.3	151020 0260	131,50
26.5	0.3	151020 0265	140,-
27.0	0.3	151020 0270	133,-
27.5	0.3	151020 0275	142,50
28.0	0.3	151020 0280	136,-
28.5	0.3	151020 0285	144,50
29.0	0.3	151020 0290	139,-
30.0	0.3	151020 0300	141,-
30.5	0.3	151020 0305	151,50
31.0	0.3	151020 0310	151,50
32.0	0.3	151020 0320	156,-
33.0	0.3	151020 0330	157,50
34.0	0.3	151020 0340	159,-
35.0	0.3	151020 0350	166,50
36.0	0.3	151020 0360	168,50
37.0	0.3	151020 0370	175,-
38.0	0.3	151020 0380	187,-
39.0	0.3	151020 0390	191,-
40.0	0.3	151020 0400	195,50

1130

D mm	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
41.0	0.3	151020 0410	207,-
42.0	0.3	151020 0420	210,-
43.0	0.3	151020 0430	235,-
44.0	0.3	151020 0440	238,-
45.0	0.3	151020 0450	242,-
46.0	0.3	151020 0460	245,-
47.0	0.3	151020 0470	249,-
48.0	0.3	151020 0480	252,-
49.0	0.3	151020 0490	266,-
50.0	0.3	151020 0500	350,-
51.0	0.3	151020 0510	355,-
52.0	0.3	151020 0520	360,-
53.0	0.3	151020 0530	360,-
54.0	0.3	151020 0540	365,-
55.0	0.3	151020 0550	370,-
56.0	0.3	151020 0560	375,-
58.0	0.3	151020 0580	380,-
60.0	0.3	151020 0600	390,-
62.0	0.3	151020 0620	395,-
64.0	0.3	151020 0640	460,-
65.0	0.3	151020 0650	440,-
66.0	0.3	151020 0660	460,-

1130

**Pilot pin, hardened and ground, model 2**

- Fixed pilot pin (\* = rotating pilot pin)
- Total length 105 mm
- Shank Ø 10 mm



D mm	art.no.	€
11.5	<b>151035 0115</b>	<b>24,90</b>
12.0	151035 0120	24,90
12.5	151035 0125	24,90
13.0	151035 0130	24,90
13.5	151035 0135	24,90
14.0	151035 0140	29,-
14.5	151035 0145	29,-
15.0	151035 0150	29,-
16.0	151035 0160	29,-
17.0	151035 0170	29,-
18.0	151035 0180	29,-
19.0	151035 0190	29,-
20.0	151035 0200	29,-
21.0	151035 0210	32,40
22.0	151035 0220	32,40
23.0	151035 0230	32,40
24.0	151035 0240	32,40
25.0	151035 0250	32,40
26.0	151035 0260	39,70
27.0	151035 0270	49,10
28.0	151035 0280	49,60
29.0	151035 0290	49,60
30.0	151035 0300	49,60
33.0*	151035 0330	57,10
35.0*	151035 0350	61,30
38.0*	151035 0380	70,70
40.0*	151035 0400	82,80

1130
























Tangential is...

... highly economical.

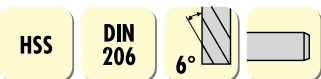
**ATORN**<sup>®</sup>  
Performance demands quality

## Overview of reamers

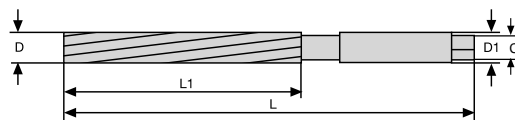
Sorting by cutting material and shank	Hand reamers				Machine reamers					
										
Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	SARA	ATORN®	ATORN®	ATORN®	ATORN®
Diameter	1.5 - 40	8 - 37	1.5 - 50	1.5 - 50	2 - 20	6.4 - 40	1.5 - 20	2 - 12	2 - 10	3 - 20
ISO	P K N	P K N	P N	P N	P K N	P K N	P K N	P K N	P K N	P K N
Tolerance	H7						H7	H7	H7	H7
DIN	206	WN	9	9	2179	311	212	WN	WN	212
Shank	Straight	Straight	Straight	Straight	Straight	MT	Straight	Straight	Straight	Straight
Cutting material	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS-E
Coating										
Helix angle	6°			6°	45°	25°	10°	10°	10°	9°
Type/info		adjustable	1:50	1:50	1:50	Taper bridge		Long	Extra-long	NC
Item number	160101....	160110....	160140....	160145....	160150....	160130....	161001....	161002....	161003....	161010....
Page	330	330	331	331	332	333	334	335	335	336

Sorting by cutting material and shank	Machine reamers							High-performance reamers			
											
Brand	ATORN®	ATORN®	BECK	ATORN®	ATORN®	ATORN®	ATORN®	SARA	SARA	SARA	ATORN®
Diameter	1 - 12.03	2 - 20	6 - 40	3 - 50	14 - 30	1.5 - 12	1 - 20	0.6 - 13.05	4 - 20	4 - 20	10 - 40
ISO	P K N	P M N	P M K	P K N	P K N	P M K N	P M K N	P K N	P K	P K	P M K
Tolerance	0/+0.003	H7	H7	H7	H7	H7	H7	0/+0.003/+0.004/+0.005	H7	H7	H7
DIN	212	212	WN	208	WN	WN	WN	WN	WN	WN	WN
Shank	Straight	Straight	Straight	MT	MT	Straight	Straight	Straight	Straight	Straight	Straight
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating			TiAlN						TiAlN	TiAlN	TiAlN
Helix angle	7 - 8°	45°		9°	10°	9°	9°	10°	7°		
Type/info	1/100	Spiral geometry	HNC ecoSpeed		Long, Extra-long		NC	1/100	Coolant bore	Coolant bore	modular
Item number	161030....	161015....	163010....	161005....	161006....	163001....	163005....	163002....	163510....	163512....	163610....
Page	337	337	338	339	339	340	340	341	342	342	343

## ATORN® Hand reamers



- **Type B for H7 fit**
- Right-hand cutting, manufacturing tolerances in accordance with DIN 1420
- Spiral-fluted, long chamfer along 1/4 of the cutting edge length
- Even ridge count with irregular pitch for chatter-free bore reaming
- Straight shank and square end
- **Cutting material: HSS**
- For reaming through-holes



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC

D H7 mm	D1 mm	L1 mm	L mm	C mm	Z	art.no.	€
1.5	1.5	20	41	1.12	4	160101 0015	28,50
2.0	2.0	25	50	1.60	4	160101 0020	28,50
2.5	2.5	29	58	2.00	4	160101 0025	28,50
3.0	3.0	31	62	2.24	6	160101 0030	25,50
3.5	3.5	35	71	2.80	6	160101 0035	28,50
4.0	4.0	38	76	3.15	6	160101 0040	24,70
4.5	4.5	41	81	3.55	6	160101 0045	28,50
5.0	5.0	44	87	4.00	6	160101 0050	26,30
5.5	5.5	47	93	4.50	6	160101 0055	29,-
6.0	6.0	47	93	4.50	6	160101 0060	26,30
7.0	7.0	54	107	5.60	6	160101 0070	27,30
8.0	8.0	58	115	6.30	6	160101 0080	28,50
9.0	9.0	62	124	7.10	6	160101 0090	33,40
10.0	10.0	66	133	8.00	6	160101 0100	33,80
11.0	11.0	71	142	9.00	8	160101 0110	39,30
12.0	12.0	76	152	10.00	8	160101 0120	43,40
13.0	13.0	76	152	10.00	8	160101 0130	60,10
14.0	14.0	81	163	11.20	8	160101 0140	65,10

1134

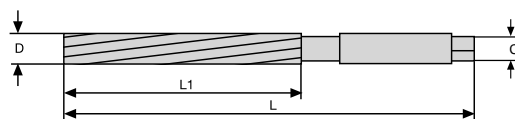
D H7 mm	D1 mm	L1 mm	L mm	C mm	Z	art.no.	€
15.0	15.0	81	163	11.20	8	160101 0150	72,30
16.0	16.0	87	175	12.50	8	160101 0160	75,30
17.0	17.0	87	175	12.50	8	160101 0170	83,40
18.0	18.0	93	188	14.00	8	160101 0180	85,50
19.0	19.0	93	188	14.00	8	160101 0190	95,60
20.0	20.0	100	201	16.00	10	160101 0200	95,60
22.0	22.0	107	215	18.00	10	160101 0220	101,-
24.0	24.0	115	231	20.00	10	160101 0240	122,50
25.0	25.0	115	231	20.00	10	160101 0250	126,50
26.0	26.0	115	231	20.00	10	160101 0260	131,50
28.0	28.0	124	247	22.40	10	160101 0280	185,50
30.0	30.0	124	247	22.40	10	160101 0300	185,50
32.0	32.0	133	265	25.00	12	160101 0320	191,50
34.0	34.0	142	284	28.00	12	160101 0340	234,-
35.0	35.0	142	284	28.00	12	160101 0350	234,-
36.0	36.0	142	284	28.00	12	160101 0360	250,-
38.0	38.0	152	305	31.50	12	160101 0380	280,-
40.0	40.0	152	305	31.50	12	160101 0400	285,-

1134

## ATORN® Quick-adjustment hand reamers



- Right-hand cutting, 4 cutting edges
- Straight shank and square end
- Large adjusting range, fine adjustment with ring gauges or micrometre
- **Cutting material: HSS**
- For repair work that does not require narrow fit tolerances, and for intermediate dimensions



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC

Model	D mm	L1 mm	L mm	C mm	Z	art.no.	€
0	8.0 - 9.0	32	111	4.3	5	160110 0090	95,90
1	9.0 - 10.0	32	115	4.3	5	160110 0100	100,50
2	10.0 - 11.0	35	120	4.9	5	160110 0110	100,50
3	11.0 - 12.0	35	125	6.2	5	160110 0120	100,50
4	12.0 - 13.5	42	130	6.2	5	160110 0135	112,-
5	13.5 - 15.5	50	145	7	5	160110 0155	125,50
6	15.5 - 18.0	60	165	8	5	160110 0180	129,-
7	18.0 - 21.0	65	180	9	5	160110 0210	140,-
8	21.0 - 24.0	70	190	10	5	160110 0240	169,-
9	24.0 - 27.5	75	205	11	5	160110 0275	180,-
10	27.5 - 31.5	80	225	12	6	160110 0315	218,-
11	31.5 - 37.0	90	240	14.5	6	160110 0370	306,-
12	37.0 - 45.0	100	285	16	6	160110 0450	399,-
13	45.0 - 55.0	109	320	20	6	160110 0550	539,-
14	55.0 - 65.0	120	350	24	8	160110 0670	679,-

1135

Sets available on request



# ATORN® Hand taper reamers

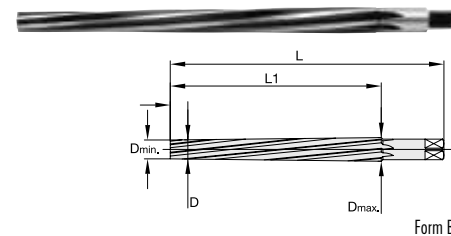
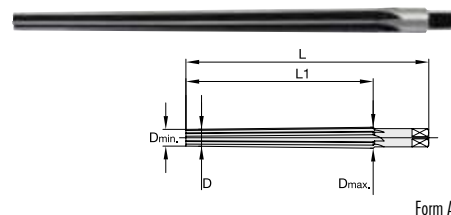


- 1:50 taper for taper pins
- **Type A**, straight-fluted
- **Type B**, spiral-fluted, 6° left-hand twist
- Shank design: straight with square end
- For taper pins in accordance with DIN EN 22339, DIN 258, DIN EN 28737 and DIN EN 28736
- For output bores, we recommend conical pin-hole drill bit no. 101025....
- Ø 13 mm and Ø 14 mm, non-DIN
- \* These dimensions are not included in the standard

material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●									●	○					

D mm	D min. mm	D max. mm	L mm	L1 mm	Z	Form A		Form B	
						art.no.	€	art.no.	€
1.50	1.40	2.14	57	37	3	160140 0015	39,80	160145 0015	39,80
1.60*	1.50	2.24	57	37	3	160140 0016	39,80	160145 0016	39,80
2.00	1.90	2.86	68	48	4	160140 0020	37,40	160145 0020	37,40
2.50	2.40	3.36	68	48	4	160140 0025	35,50	160145 0025	35,50
3.00	2.90	4.06	80	58	5	160140 0030	32,60	160145 0030	32,60
3.50*	3.40	4.90	100	75	5	160140 0035	40,20	160145 0035	39,70
4.00	3.90	5.26	93	68	5	160140 0040	35,50	160145 0040	35,50
4.50*	4.40	6.14	115	87	5	160140 0045	45,40	160145 0045	45,40
5.00	4.90	6.36	100	73	5	160140 0050	37,80	160145 0050	37,80
5.50*	5.40	7.78	150	119	6	160140 0055	59,30	160145 0055	59,30
6.00	5.90	8.00	135	105	6	160140 0060	46,70	160145 0060	46,70
6.50*	6.40	8.78	150	119	6	160140 0065	61,-	160145 0065	61,-
7.00*	6.90	9.72	177	141	6	160140 0070	71,90	160145 0070	71,90
8.00	7.90	10.80	180	145	6	160140 0080	72,-	160145 0080	72,-
9.00*	8.90	12.16	205	163	6	160140 0090	108,-	160145 0090	108,-
10.00	9.90	13.40	215	175	6	160140 0100	103,50	160145 0100	103,50
12.00	11.80	16.00	255	210	8	160140 0120	137,50	160145 0120	137,50
13.00*	12.86	16.74	240	194	8	160140 0130	148,-	160145 0130	148,-
14.00*	13.86	17.74	240	194	8	160140 0140	146,-	160145 0140	146,-
16.00	15.80	20.40	280	230	8	160140 0160	177,-	160145 0160	177,-
20.00	19.80	24.80	310	250	10	160140 0200	232,-	160145 0200	232,-
25.00	24.70	30.70	370	300	10	160140 0250	415,-	160145 0250	415,-
30.00	29.70	36.10	400	320	12	160140 0300	509,-	160145 0300	509,-
40.00	39.70	46.50	430	340	12	160140 0400	819,-	160145 0400	819,-
50.00	49.70	56.90	460	360	14	160140 0500	1.309,-	160145 0500	1.309,-

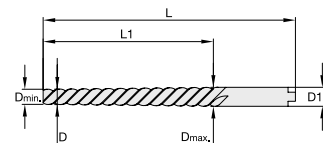
1134 1134



## ATORN® High helix taper reamers

HSS-E
DIN 2179
1:50
45°
i
Vc/fz
413

- Taper 1:50 for taper pins
- Shank design: straight with driving pin lugs in accordance with DIN 1809
- For taper pins in accordance with DIN EN 22339, DIN 258, DIN EN 28737 and DIN EN 28736
- Spiral-fluted, 45° left-hand twist
- For through-holes
- For output bores, we recommend the conical drill bit for pin holes No. 101025....
- Requires extensive chip removal (do not pre-drill too deep)
- **Cutting material: HSS-E**
- Ø 6.5, 13, 14, 16 and Ø 20 mm, non-DIN



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●					●	●				●	●	○					
		6-8	6-8					6-8	4-6				6-8	6-8	6-8					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D min. mm	D max. mm	L mm	L1 mm	D1 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
2.0	1.90	2.86	86	48	3.15	2	0.25	<b>160150 0020</b>	<b>38,30</b>
2.5	2.40	3.36	86	48	3.15	3	0.25	160150 0025	<b>44,60</b>
3.0	2.90	4.06	100	58	4.00	3	0.25	160150 0030	<b>40,70</b>
4.0	3.90	5.26	112	68	5.00	3	0.45	160150 0040	<b>39,70</b>
5.0	4.90	6.36	122	73	6.30	3	0.45	160150 0050	<b>43,60</b>
6.0	5.90	8.00	160	105	8.00	3	0.45	160150 0060	<b>48,70</b>
6.5	6.40	8.78	187	119	8.50	3	0.45	160150 0065	<b>66,20</b>
8.0	7.90	10.80	207	145	10.0	3	0.45	160150 0080	<b>77,30</b>
10.0	9.90	13.40	245	175	12.5	3	0.45	160150 0100	<b>99,70</b>
12.0	11.80	16.00	290	210	16.0	3	0.50	160150 0120	<b>130,50</b>
13.0	12.86	16.74	275	194	16.0	3	0.50	160150 0130	<b>209,-</b>
14.0	13.86	17.74	275	194	17.0	3	0.50	160150 0140	<b>254,-</b>
16.0	15.84	21.12	355	264	20.0	3	0.55	160150 0160	<b>399,-</b>
20.0	19.80	25.20	370	270	24.0	3	0.55	160150 0200	<b>539,-</b>

1134



Grooving from 2 mm ...

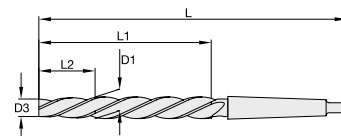
... with internal cooling.

**ATORN®**  
Performance demands quality

## SARA® Taper bridge reamers



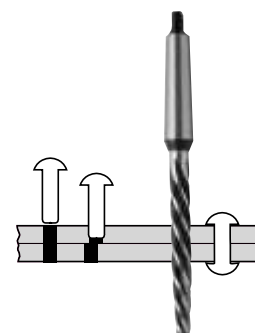
- Right-hand cutting
- Cutting edge lengths 1/3 tapered, 2/3 straight
- Shank design: MT
- Spiral-fluted, 25° left-hand twist
- **Cutting material: HSS**
- Used for reaming bores that are too small or offset



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	● very well suited ○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 10-15	○ 8-12					● 10-15	● 10-12			● 15-20	○ 15-20	● 20-30				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D1 mm	D3 mm	L mm	L1 mm	L2 mm	Shank	Z	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
6.4	4,5	151	75	19	MT 1	3	0.15	<b>160130 0064</b>	<b>70,20</b>
7.4	5.2	156	80	22	MT 1	3	0.15	160130 0074	<b>73,30</b>
8.0	5.5	161	85	25	MT 1	3	0.15	160130 0080	<b>73,30</b>
8.4	5.9	161	85	25	MT 1	3	0.15	160130 0084	<b>73,30</b>
9.0	6.3	166	90	27	MT 1	4	0.15	160130 0090	<b>73,30</b>
9.5	6.6	166	90	27	MT 1	4	0.15	160130 0095	<b>73,30</b>
10.0	7	171	95	30	MT 1	4	0.15	160130 0100	<b>73,30</b>
11.0	7.7	176	100	33	MT 1	4	0.25	160130 0110	<b>73,30</b>
12.0	8.4	199	105	39	MT 2	5	0.25	160130 0120	<b>78,40</b>
13.0	9.1	199	105	39	MT 2	5	0.25	160130 0130	<b>78,40</b>
14.0	9.8	209	115	42	MT 2	5	0.25	160130 0140	<b>80,40</b>
15.0	10.5	219	125	45	MT 2	5	0.25	160130 0150	<b>84,50</b>
16.0	11.2	229	135	48	MT 2	5	0.25	160130 0160	<b>89,50</b>
17.0	11.9	251	135	51	MT3	5	0.25	160130 0170	<b>105,-</b>
18.0	12.6	261	145	58	MT3	5	0.25	160130 0180	<b>113,-</b>
19.0	13.3	261	145	58	MT3	5	0.25	160130 0190	<b>125,-</b>
20.0	14	271	155	62	MT3	5	0.25	160130 0200	<b>127,-</b>
21.0	14.7	271	155	62	MT3	5	0.25	160130 0210	<b>131,-</b>
22.0	15.4	281	165	66	MT3	5	0.25	160130 0220	<b>140,-</b>
23.0	16.4	281	165	66	MT3	5	0.25	160130 0230	<b>148,-</b>
24.0	16.8	296	180	72	MT3	5	0.25	160130 0240	<b>160,50</b>
25.0	17.5	296	180	72	MT3	5	0.25	160130 0250	<b>162,-</b>
26.0	18.2	296	180	72	MT3	5	0.37	160130 0260	<b>173,-</b>
27.0	18.9	311	195	78	MT3	5	0.37	160130 0270	<b>193,-</b>
28.0	19.6	311	195	78	MT3	5	0.37	160130 0280	<b>193,-</b>
29.0	20.3	311	195	78	MT3	5	0.37	160130 0290	<b>234,-</b>
30.0	21	311	195	78	MT3	5	0.37	160130 0300	<b>221,-</b>
31.0	21.7	326	210	84	MT3	5	0.37	160130 0310	<b>252,-</b>
32.0	22.4	354	210	84	MT 4	5	0.40	160130 0320	<b>297,-</b>
33.0	23.1	354	210	84	MT 4	5	0.40	160130 0330	<b>321,-</b>
34.0	23.8	364	220	88	MT 4	5	0.40	160130 0340	<b>335,-</b>
35.0	24.5	364	220	88	MT 4	5	0.40	160130 0350	<b>380,-</b>
36.0	25.2	364	220	88	MT 4	5	0.40	160130 0360	<b>380,-</b>
37.0	25.9	364	220	88	MT 4	5	0.40	160130 0370	<b>380,-</b>
38.0	26.6	374	230	92	MT 4	5	0.40	160130 0380	<b>420,-</b>
39.0	27.3	374	230	92	MT 4	5	0.40	160130 0390	<b>420,-</b>
40.0	28	374	230	92	MT 4	5	0.40	160130 0400	<b>420,-</b>



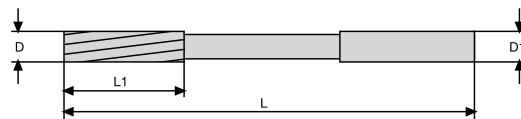
Used for reaming bores that are too small or offset



# ATORN® Machine reamers

HSS-E
DIN 212
Werks-norm
H7
9°
10°
Vc/fz
414

- Type B with offset shank up to Ø 2.8 mm
- Type D with offset shank up to Ø 2.9 mm
- **For H7 fit**
- Right-hand cutting, straight shank
- Manufacturing tolerances in accordance with DIN 1420
- Ground chip-space version
- **Cutting material: HSS-E**
- For reaming through-holes



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8% Si	≥ 8% Si	Co-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
		8-10	6-8	4-6				8-10	8-10			15-20	15-20	8-12					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Standard version

- Available on request: Ø 0.90 mm to Ø 12.05 mm in 0.01 mm increments



D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
1.5	8	40	1.5	3	0.10	161001 0015	32,30
1.6	9	43	1.6	3	0.10	161001 0016	37,-
1.7	9	43	1.6	3	0.10	161001 0017	37,-
1.8	10	46	1.8	4	0.10	161001 0018	37,-
1.9	10	46	1.8	4	0.10	161001 0019	37,-
2.0	11	49	2.0	4	0.10	161001 0020	29,30
2.1	11	49	2.0	4	0.10	161001 0021	37,-
2.2	12	53	2.2	4	0.10	161001 0022	37,-
2.3	12	53	2.2	4	0.10	161001 0023	37,-
2.4	14	57	2.5	4	0.10	161001 0024	37,-
2.5	14	57	2.5	4	0.10	161001 0025	29,30
2.6	14	57	2.5	4	0.10	161001 0026	38,10
2.7	15	61	2.8	4	0.10	161001 0027	38,10
2.8	15	61	2.8	6	0.10	161001 0028	38,10
2.9	15	61	3.0	6	0.10	161001 0029	38,10
3.0	15	61	3.0	6	0.10	161001 0030	27,30
3.1	16	65	3.2	6	0.10	161001 0031	36,30
3.2	16	65	3.2	6	0.10	161001 0032	36,30
3.3	16	65	3.2	6	0.10	161001 0033	36,30
3.4	18	70	3.5	6	0.10	161001 0034	36,30
3.5	18	70	3.5	6	0.10	161001 0035	31,60
3.6	18	70	3.5	6	0.10	161001 0036	40,10
3.7	18	70	3.5	6	0.10	161001 0037	40,10
3.8	19	75	4.0	6	0.10	161001 0038	40,10
3.9	19	75	4.0	6	0.10	161001 0039	40,60
4.0	19	75	4.0	6	0.10	161001 0040	29,30
4.1	19	75	4.0	6	0.10	161001 0041	37,60
4.2	19	75	4.0	6	0.10	161001 0042	37,60
4.3	21	80	4.5	6	0.10	161001 0043	37,60
4.4	21	80	4.5	6	0.10	161001 0044	37,60
4.5	21	80	4.5	6	0.10	161001 0045	31,60
4.6	21	80	4.5	6	0.10	161001 0046	40,50
4.7	21	80	4.5	6	0.10	161001 0047	40,50
4.8	23	86	5.0	6	0.10	161001 0048	40,50
4.9	23	86	5.0	6	0.10	161001 0049	40,50
5.0	23	86	5.0	6	0.10	161001 0050	30,50
5.1	23	86	5.0	6	0.13	161001 0051	40,50
5.2	23	86	5.0	6	0.13	161001 0052	40,50
5.3	23	86	5.0	6	0.13	161001 0053	40,50
5.4	26	93	5.6	6	0.13	161001 0054	40,50
5.5	26	93	5.6	6	0.13	161001 0055	37,60
5.6	26	93	5.6	6	0.13	161001 0056	40,50

1134

D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
5.7	26	93	5.6	6	0.13	161001 0057	40,50
5.8	26	93	5.6	6	0.13	161001 0058	40,50
5.9	26	93	5.6	6	0.13	161001 0059	40,50
6.0	26	93	5.6	6	0.13	161001 0060	32,30
6.1	28	101	6.3	6	0.13	161001 0061	40,50
6.2	28	101	6.3	6	0.13	161001 0062	40,50
6.3	28	101	6.3	6	0.13	161001 0063	40,50
6.4	28	101	6.3	6	0.13	161001 0064	40,50
6.5	28	101	6.3	6	0.13	161001 0065	39,80
6.6	28	101	6.3	6	0.13	161001 0066	40,50
6.7	28	101	6.3	6	0.13	161001 0067	40,50
6.8	31	109	7.1	6	0.13	161001 0068	40,50
6.9	31	109	7.1	6	0.13	161001 0069	40,50
7.0	31	109	7.1	6	0.13	161001 0070	39,80
7.1	31	109	7.1	6	0.13	161001 0071	45,60
7.2	31	109	7.1	6	0.13	161001 0072	45,60
7.3	31	109	7.1	6	0.13	161001 0073	45,60
7.4	31	109	7.1	6	0.13	161001 0074	45,60
7.5	31	109	7.1	6	0.13	161001 0075	44,40
7.6	33	117	8.0	6	0.13	161001 0076	45,60
7.7	33	117	8.0	6	0.13	161001 0077	45,60
7.8	33	117	8.0	6	0.13	161001 0078	45,60
7.9	33	117	8.0	6	0.13	161001 0079	45,60
8.0	33	117	8.0	6	0.13	161001 0080	40,50
8.1	33	117	8.0	6	0.13	161001 0081	56,-
8.2	33	117	8.0	6	0.13	161001 0082	56,-
8.3	33	117	8.0	6	0.13	161001 0083	56,-
8.4	33	117	8.0	6	0.13	161001 0084	56,-
8.5	33	117	8.0	6	0.13	161001 0085	51,70
8.6	36	125	9.0	6	0.13	161001 0086	56,-
8.7	36	125	9.0	6	0.13	161001 0087	56,-
8.8	36	125	9.0	6	0.13	161001 0088	56,-
8.9	36	125	9.0	6	0.13	161001 0089	56,-
9.0	36	125	9.0	6	0.15	161001 0090	46,60
9.1	36	125	9.0	6	0.15	161001 0091	56,-
9.2	36	125	9.0	6	0.15	161001 0092	56,-
9.3	36	125	9.0	6	0.15	161001 0093	56,-
9.4	36	125	9.0	6	0.15	161001 0094	56,-
9.5	36	125	9.0	6	0.15	161001 0095	52,20
9.6	38	133	10.0	6	0.15	161001 0096	56,-
9.7	38	133	10.0	6	0.15	161001 0097	56,-
9.8	38	133	10.0	6	0.15	161001 0098	56,-

1134

D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
9.9	38	133	10.0	6	0.15	161001 0099	56,-
10.0	38	133	10.0	6	0.15	161001 0100	47,20
11.0	41	142	10.0	6	0.15	161001 0110	66,30
12.0	44	151	10.0	6	0.20	161001 0120	68,80
13.0	44	151	10.0	8	0.20	161001 0130	79,10
14.0	47	160	12.5	8	0.20	161001 0140	80,80

1134

D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
15.0	50	162	12.5	8	0.20	161001 0150	82,50
16.0	52	170	12.5	8	0.20	161001 0160	85,50
17.0	54	175	14.0	8	0.25	161001 0170	102,-
18.0	56	182	14.0	8	0.25	161001 0180	104,50
19.0	58	189	16.0	8	0.25	161001 0190	124,-
20.0	60	195	16.0	8	0.25	161001 0200	117,-

1134

## Long, company standard

D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2	14	65	2	6	0.10	161002 0020	77,30
3	14	90	3	6	0.10	161002 0030	65,10
4	16	105	4	6	0.10	161002 0040	65,10
5	16	115	5	6	0.10	161002 0050	61,10

1135

D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
6	16	130	6	6	0.13	161002 0060	60,10
8	18	160	8	6	0.13	161002 0080	66,20
10	20	190	10	6	0.15	161002 0100	75,30
12	20	210	12	6	0.20	161002 0120	86,50

1135

## Extra-long, company standard

D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
2	20	80	2	6	0.10	161003 0020	219,-
3	30	120	3	6	0.10	161003 0030	196,50
4	30	160	4	6	0.10	161003 0040	196,50
5	30	200	5	6	0.10	161003 0050	174,50

1135

D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm <sup>2</sup> mm/rev	art.no.	€
6	35	250	6	6	0.13	161003 0060	174,50
8	35	250	8	6	0.13	161003 0080	170,50
10	35	250	10	6	0.15	161003 0100	170,50

1135



Multiple clamping ...

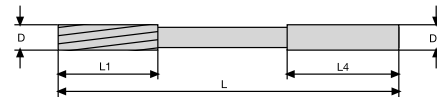
... precise and powerful.

**ATORN**<sup>®</sup>  
Performance demands quality

# ATORN® NC machine reamers

HSS-E
DIN 212
Werks-norm
H7
9°
Vc/tz
414

- For H7 fit
- Right-hand cutting
- **Cutting material: HSS-E**
- Straight shank without square end
- Form D: spiral-fluted with offset shank
- **To ensure maximum true running accuracy for use in hydraulic expansion chucks** and high-precision chucks, these reamers are delivered with **even shank diameters** suitable
- for reaming through-holes and blind holes
- **Also available in TiN-coated version**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	○				●	●				○	○	○					
		8-10	6-8	4-6				8-10	8-10				15-20	15-20	8-12					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Single

D H7 mm	D1 h6 mm	L mm	L1 mm	L4 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
3	3	61	15	28	6	0.10	161010 0030	15,50
3.5	4	70	18	28	6	0.10	161010 0035	15,50
4	4	75	19	28	6	0.10	161010 0040	14,75
4.5	5	80	21	28	6	0.10	161010 0045	15,80
5	5	86	23	28	6	0.10	161010 0050	15,40
5.5	6	93	26	36	6	0.13	161010 0055	17,10
6	6	93	26	36	6	0.13	161010 0060	15,90
6.5	6	101	28	36	6	0.13	161010 0065	19,55
7	8	109	31	36	6	0.13	161010 0070	19,55
8	8	117	33	36	6	0.13	161010 0080	19,75
9	10	125	36	40	6	0.15	161010 0090	23,80
10	10	133	38	40	6	0.15	161010 0100	25,10
11	10	142	41	40	6	0.15	161010 0110	32,70
12	10	151	44	40	6	0.20	161010 0120	36,80
14	14	160	47	45	8	0.20	161010 0140	36,80
15	14	162	50	45	8	0.20	161010 0150	37,80
16	14	170	52	45	8	0.20	161010 0160	39,90
18	14	182	56	45	8	0.25	161010 0180	47,50
20	16	195	60	48	8	0.25	161010 0200	53,40



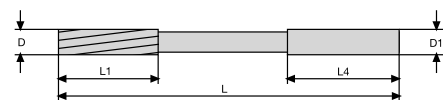
1135

## ATORN® 1/100 NC machine reamers

**HSS-E** **DIN 212** **9°** **Vc/fz** **414**  
**415**



- With straight shank and 9° left-hand twist, ground chip space
- Form B up to Ø 2.03 mm with end-to-end shank and centring point on both sides
- Form D from Ø 2.98-12.03 mm with offset shank
- Manufacturing tolerances: Nominal dimensions = 0/+ 0.003 mm



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		8-10	4-8					8-10	8-10				15-20	15-20	8-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Specify nominal dimension D in mm as a four digit figure:

- e.g. 0.72 mm = 0072, 5.14 mm = 0514, 11.00 mm = 1100

D mm	D1 h6 mm	L mm	L1 mm	L4 mm	Z	Feed f steel < 1000 N/mm² mm/rev	161030.... €
1.00	1	34	5.5	19	3	0.08	20,60
1.98 - 2.03	2	49	11	25	4	0.09	17,90
2.98 - 3.00	3	61	15	28	6	0.10	19,05
3.01 - 3.03	4	65	16	28	6	0.10	19,55
3.98 - 4.03	4	75	19	28	6	0.10	20,90
4.98 - 5.03	5	86	23	28	6	0.10	22,20
5.98 - 6.00	6	93	26	36	6	0.10	22,20
6.01 - 6.03	6	101	28	36	6	0.12	22,20
6.98 - 7.03	8	109	31	36	6	0.12	22,20
7.98 - 8.00	8	117	33	36	6	0.12	26,60
8.01 - 8.03	8	117	33	36	6	0.13	26,60
9.98 - 10.03	10	133	38	40	6	0.13	31,90
11.98 - 12.03	10	151	44	40	6	0.15	40,30

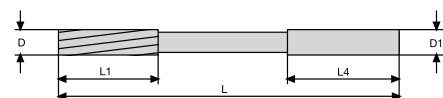
1135

## ATORN® High helix machine reamers

**HSS-E** **DIN 212** **H7** **45°** **Vc/fz** **414**



- For **H7 fit**
- Right-hand cutting
- 45° left-hand twist, type E
- Straight shank
- With tapered chamfer along approx. 1/6 of the cutting edge length
- For **through-holes**
- Clean, chatter-free surface
- Broad chip spaces for high cutting speeds and up to 100 % higher feed rates
- **Cutting material: HSS-E**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		8-10	6-8										15-20	15-20	8-12				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D H7 mm	D1 h6 mm	L mm	L1 mm	L4 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
2.0	2.0	49	11	25	3	0.10	161015 0020	22,70
2.5	2.5	57	14	28	3	0.10	161015 0025	24,30
3.0	3.0	61	15	28	3	0.10	161015 0030	27,40
3.2	3.2	65	16	28	3	0.10	161015 0032	32,10
3.5	3.5	70	18	28	3	0.10	161015 0035	32,10
4.0	4.0	75	19	28	3	0.10	161015 0040	26,50
4.5	4.5	80	21	28	3	0.10	161015 0045	31,30
5.0	5.0	86	23	28	3	0.10	161015 0050	29,50
6.0	5.6	93	26	36	3	0.13	161015 0060	27,90
7.0	7.1	109	31	36	3	0.13	161015 0070	32,90
8.0	8.0	117	33	36	3	0.13	161015 0080	29,10
9.0	9.0	125	36	40	3	0.15	161015 0090	41,40

1134

D H7 mm	D1 h6 mm	L mm	L1 mm	L4 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
10.0	10.0	133	38	40	3	0.15	161015 0100	39,-
11.0	10.0	142	41	40	3	0.15	161015 0110	49,60
12.0	10.0	151	44	40	4	0.20	161015 0120	47,90
13.0	10.0	151	44	40	4	0.20	161015 0130	67,90
14.0	12.5	160	47	45	4	0.20	161015 0140	63,-
15.0	12.5	162	50	45	4	0.20	161015 0150	64,-
16.0	12.5	170	52	45	4	0.20	161015 0160	66,80
17.0	14.0	175	54	45	4	0.20	161015 0170	99,40
18.0	14.0	182	56	45	4	0.25	161015 0180	91,10
19.0	16.0	189	58	48	4	0.25	161015 0190	105,50
20.0	16.0	195	60	48	4	0.25	161015 0200	99,90

1134

# BECK High-performance reamers HNC ecoSpeed

HSS-E
Werks-norm
H7
DIN 6335 HA
TiAlN
i Vc/tz
416



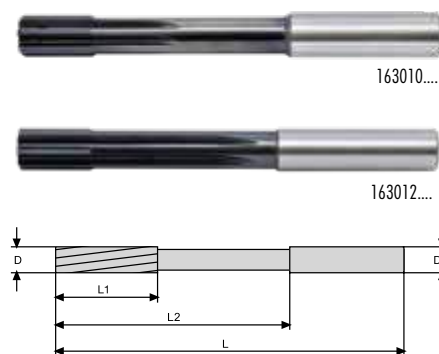
- Diameter 6-40 mm
- Manufacturing tolerances H7
- Cutting material: HSS, TiAlN-coated
- NC shank for use directly in hydraulic expansion chucks and high-precision collet chucks
- Tight h6 tool shank tolerance for a high level of true running accuracy
- With internal coolant supply:
  - Straight-fluted version, coolant discharged on the face side, for blind holes
  - Straight-fluted version, coolant discharged on the cutting edges, for blind holes

**With internal cooling**

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 35-45	● 30-40	● 15-35	○ 15-20			○ 15-20	● 20-40											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D H7	D1 h6	L	L1	L2	Z	Feed f	For clearance	For blind holes
mm	mm	mm	mm	mm		steel < 1000 N/mm <sup>2</sup>	art.no.	art.no.
						mm/rev	€	€
6	8	100	16	64	6	0.12	163010 0600 87,10	163012 0600 78,30
6.5	8	100	16	64	6	0.12	163010 0650 102,-	163012 0650 93,-
7	8	100	16	64	6	0.12	163010 0700 90,10	163012 0700 81,10
7.5	8	100	16	64	6	0.12	163010 0750 106,-	163012 0750 97,10
8	8	100	16	64	6	0.12	163010 0800 91,10	163012 0800 82,20
8.5	10	100	20	60	6	0.15	163010 0850 109,-	163012 0850 100,50
9	10	100	20	60	6	0.15	163010 0900 94,10	163012 0900 86,30
9.5	10	120	20	80	6	0.15	163010 0950 111,-	163012 0950 104,-
10	10	120	20	80	6	0.15	163010 1000 95,10	163012 1000 88,80
10.5	12	120	20	75	6	0.18	163010 1050 114,50	163012 1050 108,50
11	12	120	20	75	6	0.18	163010 1100 99,70	163012 1100 94,50
11.5	12	120	20	75	6	0.18	163010 1150 117,50	163012 1150 112,50
12	12	120	20	75	6	0.18	163010 1200 101,-	163012 1200 95,70
13	14	130	22	85	6	0.18	163010 1300 106,-	163012 1300 101,-
14	14	130	22	85	6	0.18	163010 1400 114,-	163012 1400 107,-
15	16	130	22	82	6	0.25	163010 1500 123,-	163012 1500 116,50
16	16	150	25	102	6	0.25	163010 1600 126,-	163012 1600 119,50
17	18	150	25	102	8	0.25	163010 1700 151,50	163012 1700 141,50
18	18	150	25	102	8	0.25	163010 1800 152,50	163012 1800 142,50
19	20	150	25	100	8	0.25	163010 1900 157,-	163012 1900 147,-
20	20	150	25	100	8	0.25	163010 2000 159,50	163012 2000 149,50
21	20	160	25	110	8	0.30	163010 2100 222,-	163012 2100 209,-
22	20	160	25	110	8	0.30	163010 2200 222,-	163012 2200 209,-
23	20	180	25	130	8	0.30	163010 2300 232,-	163012 2300 219,-
24	20	180	25	130	8	0.30	163010 2400 232,-	163012 2400 219,-
25	20	180	25	130	8	0.30	163010 2500 213,-	163012 2500 201,-
26	20	180	25	130	8	0.40	163010 2600 239,-	163012 2600 227,-
27	20	180	25	130	8	0.40	163010 2700 254,-	163012 2700 241,-
28	25	180	25	124	8	0.40	163010 2800 262,-	163012 2800 249,-
29	25	180	25	124	8	0.40	163010 2900 269,-	163012 2900 256,-
30	25	200	25	144	8	0.40	163010 3000 250,-	163012 3000 237,-
31	25	200	25	144	8	0.45	163010 3100 287,-	163012 3100 274,-
32	25	200	25	144	8	0.45	163010 3200 261,-	163012 3200 248,-
33	25	200	25	144	8	0.45	163010 3300 307,-	163012 3300 295,-
34	25	200	25	144	8	0.45	163010 3400 317,-	163012 3400 303,-
35	25	200	25	144	8	0.45	163010 3500 317,-	163012 3500 303,-
36	25	200	25	144	8	0.45	163010 3600 299,-	163012 3600 286,-
37	25	200	25	144	8	0.45	163010 3700 349,-	163012 3700 336,-
38	25	200	25	144	8	0.45	163010 3800 365,-	163012 3800 349,-
39	25	200	25	144	8	0.45	163010 3900 365,-	163012 3900 349,-
40	25	200	25	144	8	0.45	163010 4000 365,-	163012 4000 350,-

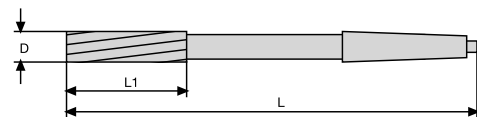


1155 1155

# ATORN® Machine reamer with MT shank

HSS-E
DIN 208
Werks-norm
H7
9°
10°
Vc/fz
414

- **Type B for H7 fit**
- Right-hand cutting
- **Morse taper**
- Spiral-fluted, short 45° chamfer
- Even ridge count with irregular pitch for chatter-free bore reaming
- **Cutting material: HSS-E**
- For reaming through-holes, chip removal in the cutting direction, suitable for blind bores due to short chamfer



material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel			
			<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si			<55 HRc	<60 HRc	≥60 HRc	
			●	●	○				●	●				○	○	○					
			8-10	6-8	4-6				8-10	8-10				15-20	15-20	8-12					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Standard version, DIN 208

- 9° left-hand twist

D H7 mm	L1 mm	L mm	Shank	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
3.0	15	112	MT 1	6	0.10	161005 0030	56,50
4.0	19	125	MT 1	6	0.10	161005 0040	49,40
5.0	23	133	MT 1	6	0.10	161005 0050	56,-
6.0	26	138	MT 1	6	0.13	161005 0060	56,-
7.0	31	150	MT 1	6	0.13	161005 0070	59,-
8.0	33	156	MT 1	6	0.13	161005 0080	59,-
9.0	36	162	MT 1	6	0.15	161005 0090	65,60
10.0	38	168	MT 1	6	0.15	161005 0100	49,90
11.0	41	175	MT 1	6	0.15	161005 0110	56,-
12.0	44	182	MT 1	6	0.20	161005 0120	54,50
13.0	44	182	MT 1	8	0.20	161005 0130	57,50
14.0	47	189	MT 1	8	0.20	161005 0140	58,50
15.0	50	204	MT 2	8	0.20	161005 0150	70,20
16.0	52	210	MT 2	8	0.20	161005 0160	71,20
17.0	54	214	MT 2	8	0.25	161005 0170	76,80
18.0	56	219	MT 2	8	0.25	161005 0180	78,40
19.0	58	223	MT 2	8	0.25	161005 0190	84,-
20.0	60	228	MT 2	8	0.25	161005 0200	84,-
21.0	62	232	MT 2	8	0.25	161005 0210	97,20

1134



D H7 mm	L1 mm	L mm	Shank	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
22.0	64	237	MT 2	8	0.25	161005 0220	95,60
23.0	66	241	MT 2	8	0.25	161005 0230	109,-
24.0	68	268	MT3	10	0.25	161005 0240	111,50
25.0	68	268	MT3	10	0.25	161005 0250	115,50
26.0	70	273	MT3	10	0.25	161005 0260	123,50
28.0	71	277	MT3	10	0.25	161005 0280	136,50
30.0	73	281	MT3	10	0.30	161005 0300	142,50
32.0	77	317	MT 4	12	0.30	161005 0320	185,50
34.0	78	321	MT 4	12	0.30	161005 0340	209,-
35.0	78	321	MT 4	12	0.30	161005 0350	209,-
36.0	79	325	MT 4	12	0.35	161005 0360	226,-
38.0	81	329	MT 4	12	0.35	161005 0380	250,-
40.0	81	329	MT 4	12	0.35	161005 0400	250,-
42.0	82	333	MT 4	12	0.35	161005 0420	274,-
44.0	83	336	MT 4	14	0.35	161005 0440	324,-
45.0	83	336	MT 4	14	0.35	161005 0450	328,-
46.0	84	340	MT 4	14	0.40	161005 0460	390,-
50.0	86	344	MT 4	14	0.40	161005 0500	410,-

1134

## Long, company standard type D

- 10° left-hand twist

D H7 mm	L1 mm	L mm	Shank	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
14.0	22	245	MT 1	8	0.20	161006 0140	118,-
15.0	22	260	MT 2	8	0.20	161006 0150	132,50
16.0	25	260	MT 2	8	0.20	161006 0160	142,50
18.0	25	260	MT 2	8	0.25	161006 0180	146,50
20.0	28	270	MT 2	8	0.25	161006 0200	161,-

1134

D H7 mm	L1 mm	L mm	Shank	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
22.0	28	280	MT 2	8	0.25	161006 0220	173,-
24.0	32	300	MT3	8	0.25	161006 0240	243,-
26.0	32	330	MT3	10	0.25	161006 0260	291,-
28.0	32	340	MT3	10	0.25	161006 0280	301,-
30.0	36	350	MT3	10	0.30	161006 0300	322,-

1134

## Extra-long, company standard type D

- 10° left-hand twist

D H7 mm	L1 mm	L mm	Shank	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
12.0	40	315	MT 1	6	0.20	161007 0120	243,-
14.0	40	315	MT 1	8	0.20	161007 0140	257,-
16.0	45	350	MT 2	8	0.20	161007 0160	355,-
18.0	45	350	MT 2	8	0.25	161007 0180	395,-
20.0	45	350	MT 2	8	0.25	161007 0200	430,-



1134

D H7 mm	L1 mm	L mm	Shank	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
22.0	45	350	MT 2	8	0.25	161007 0220	529,-
24.0	70	450	MT3	8	0.25	161007 0240	669,-
26.0	70	450	MT3	10	0.25	161007 0260	779,-
28.0	70	450	MT3	10	0.25	161007 0280	849,-
30.0	70	450	MT3	10	0.30	161007 0300	909,-

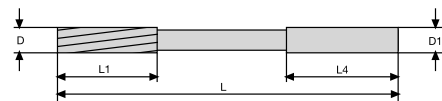
1134



## ATORN® Machine reamers

VHM Werks-norm H7 9°   414

- sim. to DIN 212/8093 for H7 fit
- Straight shank, from Ø 10.0 mm steel shank with inner centring in accordance with DIN 332 Type B
- Left-hand twist, type B, 45° chamfer
- Up to Ø 2.6 mm with external line-up clamp, from Ø 2.7 mm with inner centring
- Cutting material: solid carbide K10
- For reaming cast iron, white iron, malleable cast iron, cast steel, steel, non-ferrous metal and plastics
- For through-holes



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		10-15	8-12	6-10	10-15	8-12		8-12	8-12				15-25	15-25	20-30					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.


D H7 mm	D1 h9 mm	L mm	L1 mm	L4 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
1.5	1.5	40	8	16	3	0.15	163001 0015	38,80
2.0	2.0	49	11	20	4	0.15	163001 0020	37,10
2.5	2.5	57	14	23	4	0.15	163001 0025	40,20
3.0	3.0	61	15	20	6	0.15	163001 0030	46,30
3.5	3.5	70	18	27	6	0.15	163001 0035	51,-
4.0	4.0	75	19	32	6	0.15	163001 0040	52,70
4.5	4.5	80	21	33	6	0.15	163001 0045	62,-
5.0	5.0	86	23	34	6	0.15	163001 0050	62,-
5.5	5.6	93	26	36	6	0.18	163001 0055	77,50

D H7 mm	D1 h9 mm	L mm	L1 mm	L4 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
6.0	5.6	93	26	36	6	0.18	163001 0060	74,90
7.0	7.1	109	31	40	6	0.18	163001 0070	91,60
7.5	7.1	109	31	40	6	0.18	163001 0075	104,50
8.0	8.0	117	33	42	6	0.18	163001 0080	98,20
9.0	9.0	125	36	44	6	0.20	163001 0090	112,50
9.5	9.0	125	36	44	6	0.20	163001 0095	130,-
10.0	10.0	133	38	46	6	0.20	163001 0100	94,60
12.0	10.0	151	44	46	6	0.25	163001 0120	114,-

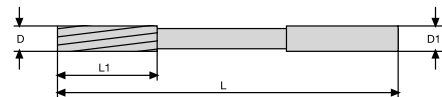
1134

1134

## ATORN® NC machine reamers

VHM DIN 212 H7 9°   414

- Similar to DIN 212/8093
- For H7 fit
- NC shank for use in hydraulic expansion chucks and high-precision collet chucks
- Form D
- Straight shank, spiral-fluted, right-hand cutting
- Up to Ø 13.0 mm solid carbide, from Ø 14 mm with steel shank
- For reaming through-holes
- Also suitable for blind bores



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		10-15	8-12	6-10	10-15	8-12		8-12	8-12				15-25	20-30						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

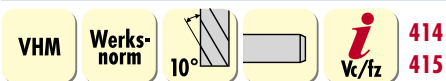
D H7 mm	D1 h6 mm	L mm	L1 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
1.0	1	34	6	3	0.15	163005 0010	49,80
1.2	1	34	6	3	0.15	163005 0012	57,90
1.4	2	40	8	3	0.15	163005 0014	57,90
1.5	2	40	8	3	0.15	163005 0015	57,90
1.6	2	43	9	3	0.15	163005 0016	57,90
1.8	2	46	10	4	0.15	163005 0018	57,90
2.0	2	49	11	4	0.15	163005 0020	57,90
2.2	3	53	12	4	0.15	163005 0022	57,90
2.5	3	57	14	4	0.15	163005 0025	57,90
2.8	3	61	15	6	0.15	163005 0028	57,90
2.9	3	61	15	6	0.15	163005 0029	57,90
3.0	3	61	15	6	0.15	163005 0030	57,90
3.2	4	65	16	6	0.15	163005 0032	57,90
3.5	4	70	18	6	0.15	163005 0035	57,90
4.0	4	75	19	6	0.15	163005 0040	57,90
4.5	5	80	21	6	0.15	163005 0045	71,70
5.0	5	86	23	6	0.15	163005 0050	71,70

D H7 mm	D1 h6 mm	L mm	L1 mm	Z	Feed f steel < 1000 N/mm² mm/rev	art.no.	€
5.5	6	93	26	6	0.18	163005 0055	71,70
6.0	6	93	26	6	0.18	163005 0060	71,70
6.5	6	101	28	6	0.18	163005 0065	89,-
7.0	8	109	31	6	0.18	163005 0070	89,-
8.0	8	117	33	6	0.18	163005 0080	89,-
9.0	10	125	36	6	0.20	163005 0090	109,-
10.0	10	133	38	6	0.20	163005 0100	109,-
11.0	10	142	41	6	0.20	163005 0110	143,-
12.0	10	151	44	6	0.25	163005 0120	143,-
13.0	10	151	44	8	0.25	163005 0130	169,50
14.0	14	160	47	8	0.25	163005 0140	174,50
15.0	14	162	50	8	0.25	163005 0150	180,50
16.0	14	170	52	8	0.25	163005 0160	186,50
17.0	14	175	54	8	0.30	163005 0170	213,-
18.0	14	182	56	8	0.30	163005 0180	239,-
19.0	16	189	58	8	0.30	163005 0190	306,-
20.0	16	195	60	8	0.30	163005 0200	285,-

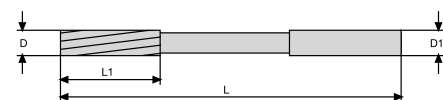
1134

1134

## SARA® 1/100 solid carbide machine reamers



- sim. to DIN 212
- Type B, type D from Ø 3.76 mm
- 10° left-hand twist, right-hand cutting, straight shank
- 1/100 pitch
- Tolerances:
  - Ø 0.60 to 3.00 mm +0/+ 0.003
  - Ø 3.01 to 6.00 mm +0/+ 0.004
  - Ø 6.01 to 13.05 mm +0/+ 0.005
- Cutting material: solid carbide K15F (Ø > 13.97 with carbide head)
- For through-holes



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		● 10-15	● 8-12	● 6-10	○ 10-15	○ 8-12		● 6-12	● 8-12				○ 15-25	● 15-25	○ 20-30				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Specify nominal dimension D in mm as a four digit figure:

- e.g. 0.72 mm = 0072, 5.14 mm = 0514, 11.00 mm = 1100

D mm	L mm	L1 mm	D1 mm	Z	Feed f steel < 1000 N/mm² mm/rev	163002.... €
0.60 - 0.69	33	7	= D	4	0.15	101,-
0.70 - 0.79	33	7	= D	4	0.15	75,80
0.80 - 0.94	33	7	= D	4	0.15	75,30
0.95 - 1.05	33	7	= D	4	0.15	42,10
1.06 - 1.44	40	10	= D	4	0.15	46,20
1.45 - 1.55	40	10	= D	4	0.15	42,10
1.56 - 1.79	43	11	= D	4	0.15	46,20
1.80 - 1.94	49	12	= D	4	0.15	46,20
1.95 - 2.05	49	12	= D	4	0.15	38,-
2.06 - 2.36	49	12	= D	4	0.15	46,20
2.37 - 2.94	57	18	= D	6	0.15	46,20
2.95 - 3.05	57	18	= D	6	0.15	38,10
3.06 - 3.35	57	18	= D	6	0.15	46,30
3.36 - 3.75	57	18	= D	6	0.15	48,-
3.76 - 4.25	75	19	4.0	6	0.15	63,60
4.26 - 4.75	80	21	4.5	6	0.15	61,10
4.76 - 5.00	86	23	5.0	6	0.15	67,20
5.01 - 5.30	86	23	5.0	6	0.18	67,20
5.31 - 5.80	93	26	5.5	6	0.18	79,90
5.81 - 5.94	101	28	6.0	6	0.18	82,90
5.95 - 6.05	101	28	6.0	6	0.18	75,80
6.06 - 6.70	101	28	6.0	6	0.18	82,90
6.71 - 7.55	109	31	7.0	6	0.18	121,50
7.56 - 7.94	117	33	8.0	6	0.18	143,50
7.95 - 8.05	117	33	8.0	6	0.18	125,50
8.06 - 8.55	117	33	8.0	6	0.18	139,50
8.56 - 8.99	125	36	9.0	6	0.18	154,-
9.00 - 9.55	125	36	9.0	6	0.2	154,-
9.56 - 9.94	133	38	10	6	0.2	159,-
9.95 - 10.05	133	38	10	6	0.2	152,-
10.06 - 11.05	133	38	10	6	0.2	159,-
11.06 - 11.30	133	38	10	6	0.2	165,50
11.31 - 11.94	151	44	12	6	0.2	218,-
11.95 - 11.99	151	44	12	6	0.2	198,50
12.00 - 12.05	151	44	12	6	0.25	198,50
12.06 - 13.05	151	44	12	6	0.25	250,-

1136

## SARA® Solid carbide high-performance reamers

VHM
Werks-norm
H7
10°
DIN 6535 HA
TiAlN
i Vc/fz
416

- **Manufacturing tolerances: H7 in accordance with DIN 1420**
- Right-hand cutting, **with internal cooling**
- **Cutting material: solid carbide, TiAlN-coated**
- NC shank for use directly in hydraulic expansion chucks and high-precision collet chucks
- Tight h6 tool shank tolerance for a high level of true running accuracy
- Version with linear flutes, coolant exits on the face side, for blind holes
- Version with 10° left-hand twist, lateral coolant outlet on the cutting edges, for through-holes
- **Other versions for machining stainless steels, aluminium, copper, zinc and Cu/Zn/Mg alloys, as well as hardened steels up to 65 HRC available on request**

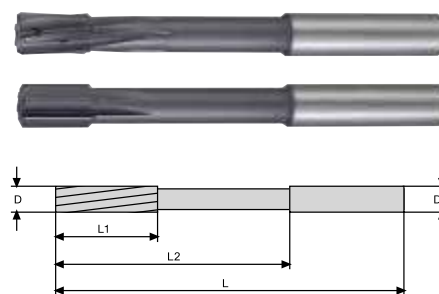


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
		●	●	●				●	●											
		80-225	80-200	60-180				70-150	60-115											

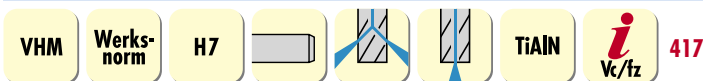
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D H7	D1 h6	L	L1	L2	Z	Feed f steel < 1000 N/mm² mm/rev	For through-holes art.no. €		For blind holes art.no. €	
4	4	75	12	47	4	0.30	163510 0400	119,50	163512 0400	119,50
4.5	6	75	12	39	4	0.30	163510 0450	124,-	163512 0450	124,-
5	6	75	12	39	4	0.40	163510 0500	124,-	163512 0500	124,-
5.5	6	75	16	39	4	0.40	163510 0550	130,50	163512 0550	130,50
6	6	75	16	39	4	0.40	163510 0600	127,-	163512 0600	127,-
6.5	8	100	16	64	6	0.40	163510 0650	137,50	163512 0650	137,50
7	8	100	16	64	6	0.70	163510 0700	137,50	163512 0700	137,50
7.5	8	100	16	64	6	0.70	163510 0750	137,50	163512 0750	137,50
8	8	100	16	64	6	0.70	163510 0800	134,-	163512 0800	134,-
8.5	10	100	19	60	6	0.70	163510 0850	167,50	163512 0850	167,50
9	10	100	19	60	6	0.70	163510 0900	167,50	163512 0900	167,50
9.5	10	120	19	80	6	0.80	163510 0950	192,50	163512 0950	192,50
10	10	120	19	80	6	0.80	163510 1000	192,50	163512 1000	192,50
10.5	12	120	19	75	6	0.80	163510 1050	250,-	163512 1050	250,-
11	12	120	19	75	6	0.80	163510 1100	250,-	163512 1100	250,-
11.5	12	120	19	75	6	0.80	163510 1150	266,-	163512 1150	266,-
12	12	120	19	75	6	0.80	163510 1200	257,-	163512 1200	257,-
13	14	120	19	75	6	0.80	163510 1300	278,-	163512 1300	278,-
14	14	135	22	90	6	0.80	163510 1400	286,-	163512 1400	286,-
15	16	135	22	87	6	0.80	163510 1500	286,-	163512 1500	286,-
16	16	135	22	87	6	0.80	163510 1600	295,-	163512 1600	295,-
17	18	145	22	97	8	0.80	163510 1700	295,-	163512 1700	295,-
18	18	145	22	97	8	0.80	163510 1800	340,-	163512 1800	340,-
19	20	145	22	95	8	0.80	163510 1900	340,-	163512 1900	340,-
20	20	145	22	95	8	1.00	163510 2000	370,-	163512 2000	370,-

1155 1155



# ATORN® High-performance exchangeable head reamers



- Modular reaming tool system
- **Diameter 10-40 mm**
- **For through-holes and blind bores**
- **Cutting material: solid carbide, TiAlN-coated**
- **With internal coolant supply**
- Particularly efficient from machining diameters of 20 mm
- Flexible machining depths thanks to various holder lengths
- Faster and more secure tool changes without new tool calibration
- **2 geometries available:**  
ST - for steel and cast iron (ISO P, K)  
VA - for stainless steels (ISO M)
- **Other designs for the efficient machining of aluminium, titanium, CFRP/GFRP, and hardened materials available on request**

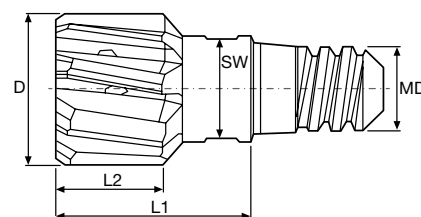
**Modular system**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GFRP/LFP/thermo.	hardened steel			
		<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
163610....	●	●	●	●				●	●											
163620....					●	●	○													
		140-160	120-160	80-140	35-40	35-40	25-30	100-120	100-120											
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																				

## Through-hole

- Left-handed twist 10°
- Radial coolant outlet
- **From Ø 28 mm use exchangeable head holder with enlarged planar support (MD = 16°)**

D H7 mm	MD	L1 mm	L2 mm	Z	Wr. width mm	Tightening torque N-m	ST		VA	
							art.no.	€	art.no.	€
10	6	18	10	6	6 mm	5	163610 1000	188,50	163620 1000	188,50
11	8	20	10	6	8 mm	12.5	163610 1100	195,50	163620 1100	195,50
12	8	20	10	6	8 mm	12.5	163610 1200	199,50	163620 1200	199,50
13	10	22	10	6	10 mm	15	163610 1300	209,-	163620 1300	209,-
14	10	22	12	6	10 mm	15	163610 1400	209,-	163620 1400	209,-
15	10	22	12	6	10 mm	15	163610 1500	219,-	163620 1500	219,-
16	10	22	12	6	10 mm	15	163610 1600	224,-	163620 1600	224,-
17	10	22	12	8	10 mm	15	163610 1700	229,-	163620 1700	229,-
18	12	26	14	8	13 mm	20	163610 1800	234,-	163620 1800	234,-
19	12	26	14	8	13 mm	20	163610 1900	239,-	163620 1900	239,-
20	12	26	14	8	13 mm	20	163610 2000	245,-	163620 2000	245,-
21	12	26	14	8	13 mm	20	163610 2100	255,-	163620 2100	255,-
22	16	26	14	8	16 mm	25	163610 2200	255,-	163620 2200	255,-
23	16	26	14	8	16 mm	25	163610 2300	265,-	163620 2300	265,-
24	16	26	14	8	16 mm	25	163610 2400	270,-	163620 2400	270,-
25	16	26	14	8	16 mm	25	163610 2500	275,-	163620 2500	275,-
26	16	26	14	8	16 mm	25	163610 2600	280,-	163620 2600	280,-
27	16	26	14	8	16 mm	25	163610 2700	285,-	163620 2700	285,-
28	16*	26	14	8	24 mm	25	163610 2800	290,-	163620 2800	290,-
29	16*	26	14	8	24 mm	25	163610 2900	295,-	163620 2900	295,-
30	16*	26	14	8	24 mm	25	163610 3000	301,-	163620 3000	301,-
31	16*	30	14	8	24 mm	25	163610 3100	306,-	163620 3100	306,-
32	16*	30	14	8	24 mm	25	163610 3200	311,-	163620 3200	311,-
33	16*	30	14	8	24 mm	25	163610 3300	316,-	163620 3300	316,-
34	16*	30	14	8	24 mm	25	163610 3400	321,-	163620 3400	321,-
35	16*	30	14	8	24 mm	25	163610 3500	331,-	163620 3500	331,-
36	16*	30	14	8	24 mm	25	163610 3600	331,-	163620 3600	331,-
37	16*	30	14	8	24 mm	25	163610 3700	341,-	163620 3700	341,-
38	16*	30	14	8	24 mm	25	163610 3800	346,-	163620 3800	346,-
39	16*	30	14	8	24 mm	25	163610 3900	355,-	163620 3900	355,-
40	16*	30	14	8	24 mm	25	163610 4000	360,-	163620 4000	360,-



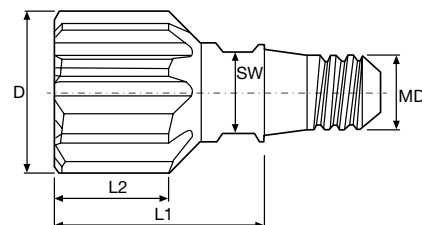
**Blind hole**

- Straight-fluted
- Axial coolant outlet
- From Ø 33 mm use exchangeable head holder with enlarged planar support (MD = 16\*)

D H7 mm	MD	L1 mm	L2 mm	Z	Wr. width	Tightening torque N-m	ST		VA	
							art.no.	€	art.no.	€
10	6	18	10	6	6 mm	12.5	163612 1000	188,50	163622 1000	188,50
11	6	20	10	6	6 mm	12.5	163612 1100	199,50	163622 1100	195,50
12	6	20	10	6	6 mm	12.5	163612 1200	199,50	163622 1200	199,50
13	6	22	12	6	6 mm	15	163612 1300	209,-	163622 1300	209,-
14	6	22	12	6	6 mm	15	163612 1400	209,-	163622 1400	209,-
15	8	22	12	6	8 mm	15	163612 1500	209,-	163622 1500	219,-
16	8	22	12	6	8 mm	15	163612 1600	224,-	163622 1600	224,-
17	10	22	12	8	10 mm	15	163612 1700	229,-	163622 1700	229,-
18	10	26	14	8	10 mm	20	163612 1800	234,-	163622 1800	234,-
19	10	26	14	8	10 mm	20	163612 1900	239,-	163622 1900	239,-
20	10	26	14	8	10 mm	20	163612 2000	245,-	163622 2000	245,-
21	12	26	14	8	13 mm	20	163612 2100	255,-	163622 2100	255,-
22	12	26	14	8	13 mm	25	163612 2200	255,-	163622 2200	255,-
23	12	26	14	8	13 mm	25	163612 2300	265,-	163622 2300	265,-
24	12	26	14	8	13 mm	25	163612 2400	270,-	163622 2400	270,-
25	16	26	14	8	16 mm	25	163612 2500	275,-	163622 2500	275,-
26	16	26	14	8	16 mm	25	163612 2600	280,-	163622 2600	280,-
27	16	26	14	8	16 mm	25	163612 2700	285,-	163622 2700	285,-
28	16	26	14	8	16 mm	25	163612 2800	290,-	163622 2800	290,-
29	16	26	14	8	16 mm	25	163612 2900	295,-	163622 2900	295,-
30	16	26	14	8	16 mm	25	163612 3000	301,-	163622 3000	301,-
31	16	30	14	8	16 mm	25	163612 3100	306,-	163622 3100	306,-
32	16	30	14	8	16 mm	25	163612 3200	311,-	163622 3200	311,-
33	16*	30	14	8	24 mm	25	163612 3300	316,-	163622 3300	316,-
34	16*	30	14	8	24 mm	25	163612 3400	321,-	163622 3400	321,-
35	16*	30	14	8	24 mm	25	163612 3500	331,-	163622 3500	331,-
36	16*	30	14	8	24 mm	25	163612 3600	331,-	163622 3600	331,-
37	16*	30	14	8	24 mm	25	163612 3700	341,-	163622 3700	341,-
38	16*	30	14	8	24 mm	25	163612 3800	346,-	163622 3800	346,-
39	16*	30	14	8	24 mm	25	163612 3900	355,-	163622 3900	355,-
40	16*	30	14	8	24 mm	25	163612 4000	360,-	163622 4000	360,-

1177

1177



Deep drilling ...

... with brainpower.

**ATORN**<sup>®</sup>  
Performance demands quality

**Exchangeable head holder**

- Straight version
- Internal coolant supply
- **MD = 16\*** exchangeable head holder with enlarged planar support

d1 mm	MD	D1 h6 mm	L mm	L1 mm	L2 mm	Tightening torque N·m	art.no.	€
7.8	6	10	60	20	40	5	<b>163630 0601</b>	<b>94,10</b>
7.8	6	10	85	45	40	5	163630 0602	105,-
7.8	6	10	150	110	40	5	163630 0603	154,-
9.8	8	12	70	25	45	12.5	163630 0801	105,-
9.8	8	12	90	45	45	12.5	163630 0802	111,-
9.8	8	12	150	105	45	12.5	163630 0803	162,-
11.8	10	16	70	22	48	15	163630 1001	117,-
11.8	10	16	90	42	48	15	163630 1002	117,-
11.8	10	16	150	102	48	15	163630 1003	167,-
15.8	12	16	80	32	48	20	163630 1201	128,50
15.8	12	16	105	57	48	20	163630 1202	138,50
15.8	12	16	150	102	48	20	163630 1203	195,50
15.8	12	16	200	152	48	20	163630 1204	360,-
19.8	16	25	90	34	56	25	163630 1611	153,-
19.8	16	25	120	64	56	25	163630 1612	172,-
19.8	16	25	200	144	56	25	163630 1613	250,-
19.8	16	25	250	194	56	25	163630 1614	380,-
26	16*	25	90	34	56	25	163630 1601	229,-
26	16*	25	120	64	56	25	163630 1602	265,-
26	16*	25	200	144	56	25	163630 1603	420,-
26	16*	25	250	194	56	25	163630 1604	569,-

1177

**Assembly key**

Wr. width mm	L mm	B mm	art.no.	€
6 mm	75	2.3	<b>163631 0006</b>	<b>8,70</b>
8 mm	92	2.8	163631 0008	8,90
10 mm	100	3.8	163631 0010	10,20
13 mm	135	3.8	163631 0013	10,85
16 mm	145	4.8	163631 0016	14,55
24 mm	215	4.8	163631 0024	21,70

1177

**Open-end snap-in spanner**

- For torque wrenches

Wr. width mm	Quadratic mm	B mm	art.no.	€
6 mm	9x12	2.3	<b>163632 0006</b>	<b>85,50</b>
8 mm	9x12	2.8	163632 0008	85,50
10 mm	9x12	3.8	163632 0010	85,50
13 mm	9x12	3.8	163632 0013	85,50
16 mm	9x12	4.8	163632 0016	85,50
24 mm	14x18	4.8	163632 0024	108,-

1177



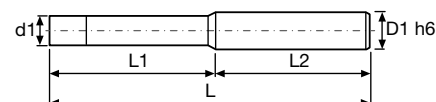
163630 1204



163630 0602



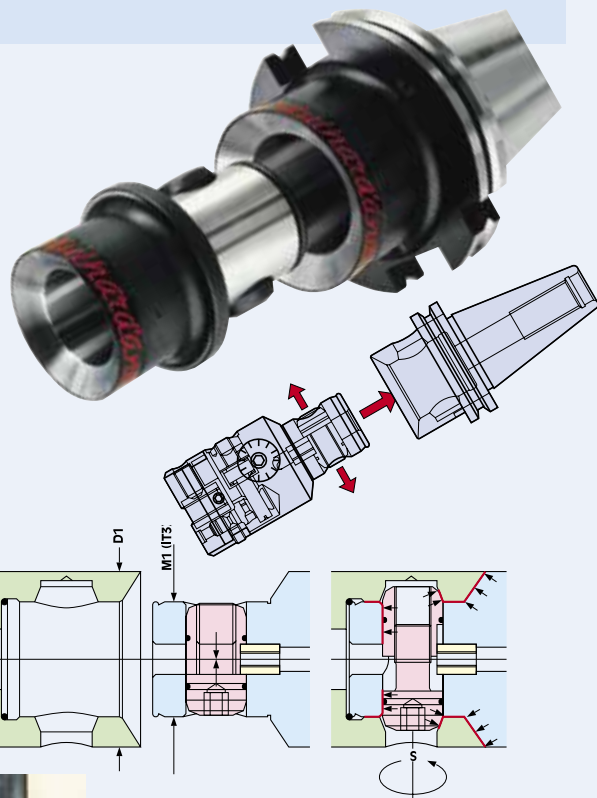
163630 1204





## D'ANDREA® MHD modular tool system

- Modular tool holder system for **line boring, milling, drilling, thread cutting**
- Rigid high-precision system, developed and manufactured with state-of-the-art design engineering and production resources based on decades of experience
- A system of extreme flexibility and simplicity for machine tools, machining centres and flexible production facilities.
- For machining with very strict tolerances with a high-grade surface finish
- Patented cylindrical/conical coupling and radial expansion bolts to ensure maximum rigidity and concentricity during boring and milling work
- Internal coolant supply in all elements
- Available in eight sizes, which allows full interchangeability

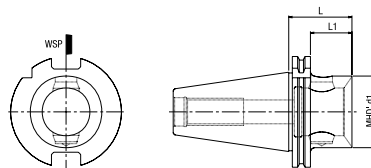


Type	D1	M1	S	Nm
MHD`16	16	10	2.5	2 - 2.5
MHD`20	20	13	3	4 - 4.5
MHD`25	25	16	3	6.5 - 7.5
MHD`32	32	20	4	7 - 8
MHD`40	40	25	5	16 - 18
MHD`50	50	32	6	30 - 35
MHD`63	63	42	8	70 - 80
MHD`80	80	42	8	70 - 80



## D'ANDREA® MHD base holding fixtures

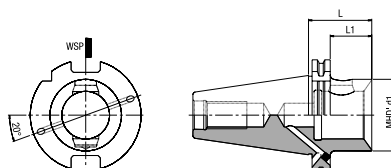
- **Case-hardened steel, hardened and ground to tolerance AT3.**
- ISO 40 taper recommended exclusively for sizes MHD-50 and MHD-63
- For heavy milling work and bores with a depth of more than 250 mm and greater than 125 mm in Ø, an MHD-80 base holding fixture should be used.
- Base holding fixtures in special designs or with **planar support** are available **on request**.



### DIN 69871 AD, ISO 7388/1

Shank	Type	MHD'd1	L mm	L1 mm	Weight kg	art.no.	€
ISO 40	DIN69871-A40 MHD'50,48	50	48	29	0.9	<b>372001 0002</b>	<b>142,50</b>
ISO 40	DIN69871-A40 MHD'63,80	63	80	-	1.5	372001 0003	163,-
ISO 50	DIN69871-A50 MHD'50,48	50	48	28	2.7	372001 0007	187,50
ISO 50	DIN69871-A50 MHD'63,56	63	56	37	2.8	372001 0008	186,50
ISO 50	DIN69871-A50 MHD'80,62	80	62	43	3.4	372001 0009	227,-

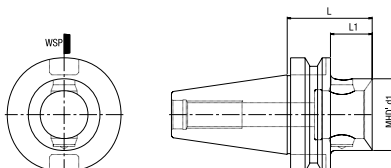
1138



### DIN 69871-B

Shank	Type	MHD'd1	L mm	L1 mm	Weight kg	art.no.	€
ISO 40	69871-B40 MHD'50,48	50	48	29	0.9	<b>372003 0001</b>	<b>159,-</b>
ISO 40	69871-B40 MHD'63,80	63	80	-	1.5	372003 0002	179,-

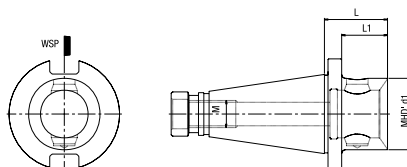
1138



### MAS 403 BT

Shank	Type	MHD'd1	L mm	L1 mm	Weight kg	art.no.	€
ISO 30	MAS403-BT30 MHD 50,60	50	60	-	0.7	<b>372005 0001</b>	<b>142,50</b>
ISO 40	MAS403-BT40 MHD 50,48	50	48	21	0.9	372005 0003	142,50
ISO 40	MAS403-BT40 MHD 63,66	63	66	-	1.2	372005 0004	163,-
ISO 50	MAS403-BT50 MHD 50,66	50	66	28	3.5	372005 0008	186,50

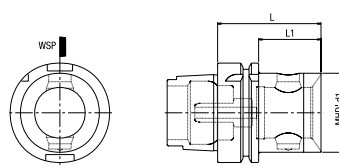
1138



### DIN 2080-A, "OTT"

Shank	Type	MHD'd1	L mm	L1 mm	M	Weight kg	art.no.	€
ISO 40	DIN2080-A40 MHD'50,48	50	48	36.5	M16	0.9	<b>372009 0001</b>	<b>142,50</b>
ISO 50	DIN2080-A50 MHD'50,48	50	48	33	M24	2.6	372009 0006	186,50
ISO 50	DIN2080-A50 MHD'63,56	63	56	41	M24	2.7	372009 0007	186,50
ISO 50	DIN2080-A50 MHD'80,60	80	60	45	M24	3.2	372009 0008	227,-

1138



### DIN 69893-A, HSK

Type	MHD'd1	L mm	L1 mm	Weight kg	art.no.	€
HSK-A63 MHD'50,66	50	66	40	0.9	<b>372017 0002</b>	<b>201,-</b>

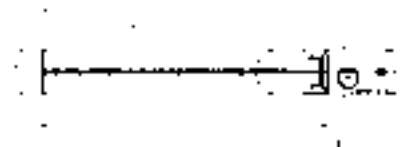
1138



## D'ANDREA® BMD solid carbide MHD base holding fixture, straight

- Due to the use of solid carbide MHD base holding fixtures, different machining depths can be achieved.
- Straight shank for use in hydraulic expansion chucks or power chucks

Line boring  
up to 10xD



Type	MHD'd1	D1 mm	L mm	L1 mm	L2 mm	Weight kg	art.no.	€
BMD 16/16,110	16	16	144	100	110	0.3	<b>372010 1611</b>	<b>360,-</b>
BMD 16/16,140	16	16	174	125	140	0.4	372010 1614	435,-
BMD 16/16,170	16	16	204	160	170	0.5	372010 1617	519,-
BMD 20/20,135	20	20	175	125	135	0.6	372010 2013	495,-
BMD 20/20,175	20	20	210	160	170	0.75	372010 2017	599,-
BMD 20/20,210	20	20	250	200	210	0.9	372010 2021	719,-
BMD 25/25,160	25	25	210	160	160	1.0	372010 2516	729,-
BMD 25/25,205	25	25	255	200	205	1.3	372010 2520	899,-
BMD 25/25,255	25	25	305	250	255	1.6	372010 2525	1.089,-
BMD 32/32,195	32	32	258	200	195	2.1	372010 3219	1.129,-
BMD 32/32,250	32	32	313	250	250	2.8	372010 3225	1.429,-
BMD 32/32,315	32	32	378	320	315	3.5	372010 3231	1.739,-

1138

## D'ANDREA® MHD extensions PR

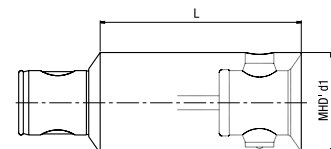
- The use of MHD extensions allows different machining depths to be achieved; various extensions are available for any MHD size.

Type	MHD'd1	L mm	Weight kg	art.no.	€
PR 16,25	16	25	0.04	<b>372201 1625</b>	<b>99,30</b>
PR 20,32	20	32	0.07	372201 2032	99,30
PR 25,25	25	25	0.09	372201 2525	99,30
PR 25,40	25	40	0.15	372201 2540	103,-
PR 32,32	32	32	0.2	372201 3232	103,-
PR 32,50	32	50	0.3	372201 3250	108,-
PR 40,40	40	40	0.4	372201 4040	108,-

1138

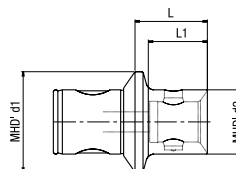
Type	MHD'd1	L mm	Weight kg	art.no.	€
PR 40,63	40	63	0.6	372201 4063	113,-
PR 50,50	50	50	1.1	372201 5050	113,-
PR 50,80	50	80	1.5	372201 5080	122,50
PR 50,100	50	100	0.7	372201 5010	131,50
PR 63,100	63	100	1.4	372201 6310	146,50
PR 63,125	63	125	2.2	372201 6312	154,-

1138



## D'ANDREA® MHD reducers RD

- Reducers permit the use of elements for smaller MHD sizes.
- This makes the MHD system even more flexible.
- Greater rigidity is achieved by using smaller MHD tools in larger holding fixtures.



Type	MHD'd1	MHD'd2	L1 mm	L mm	Weight kg	art.no.	€
RD 20/16,20	20	16	16	20	0.05	<b>372203 2016</b>	<b>97,20</b>
RD 25/16,20	25	16	15	20	0.07	372203 2516	99,30
RD 25/20,25	25	20	20	25	0.08	372203 2520	99,30
RD 32/16,24	32	16	18	24	0.15	372203 3216	103,-
RD 32/20,25	32	20	20	25	0.15	372203 3220	103,-
RD 32/25,28	32	25	23	28	0.15	372203 3225	103,-
RD 40/16,24	40	16	17	24	0.18	372203 4016	108,-
RD 40/20,26	40	20	20	26	0.20	372203 4020	108,-
RD 40/25,28	40	25	22	28	0.25	372203 4025	108,-
RD 40/32,32	40	32	27	32	0.30	372203 4032	108,-
RD 50/16,24	50	16	15	24	0.40	372203 5016	114,-

1138

Type	MHD'd1	MHD'd2	L1 mm	L mm	Weight kg	art.no.	€
RD 50/16,40	50	16	32	40	0.20	372203 5116	138,50
RD 50/20,26	50	20	18	26	0.40	372203 5020	114,-
RD 50/20,70	50	20	62	70	0.30	372203 5120	143,50
RD 50/25,28	50	25	21	28	0.40	372203 5025	114,-
RD 50/25,87	50	25	80	87	0.60	372203 5125	148,50
RD 50/32,32	50	32	25	32	0.45	372203 5032	119,-
RD 50/32,87	50	32	80	87	0.75	372203 5132	154,-
RD 50/40,36	50	40	30	36	0.50	372203 5040	119,-
RD 50/40,87	50	40	80	87	0.90	372203 5140	161,-
RD 63/50,40	63	50	34	40	0.90	372203 6250	125,50
RD 80/63,60	80	63	52	60	1.70	372203 8063	161,-

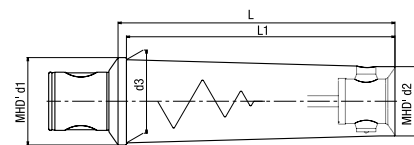
1138

## D'ANDREA® MHD reducers RAV

- Low vibration

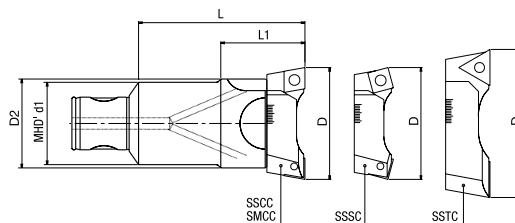
Type	MHD'd1	MHD'd2	D3 mm	L1 mm	L mm	Weight kg	art.no.	€
RAV 50/16,74	50	16	17.5	65	74	0.4	<b>372204 5016</b>	<b>228,-</b>
RAV 50/20,93	50	20	21.5	85	93	0.5	372204 5020	<b>258,-</b>
RAV 50/25,117	50	25	27	110	117	0.8	372204 5025	<b>320,-</b>
RAV 50/32,144	50	32	35	138	144	1.4	372204 5032	<b>460,-</b>
RAV 50/40,176	50	40	47	170	176	2.5	372204 5040	<b>719,-</b>
RAV 63/50,220	63	50	60	214	220	5.6	372204 6042	<b>1.259,-</b>
RAV 80/63,280	80	63	77	272	280	10.6	372204 8042	<b>2.579,-</b>

1138



## D'ANDREA® MHD two-flute boring bars TS

- Rigid design, spline surfaces between the insert holders
- Constant distance between the insert holder clamping screw and the cutting edge
- **Note:** when using only one insert holder, protective plug PT should be fitted (optional)
- Chamfer rings (AS) available on request



### TS Ø 18 - 200

Type	D mm	MHD'd1	D2 mm	L mm	L1 mm	S...	for exchangeable CC plates	for exchangeable SC plates	for exchangeable TC plates	Weight kg	art.no.	€
TS 16/16	18- 22	16	16	34	-	S...16	Yes			0.05	<b>372603 1616</b>	<b>166,-</b>
TS 20/20	22- 28	20	20	40	-	S...20	Yes			0.09	372603 2020	<b>176,-</b>
TS 25/25	28- 38	25	25	50	-	S...25	Yes			0.20	372603 2525	<b>207,-</b>
TS 32/32	35.5- 50	32	32	63	-	S...32-33	Yes	Yes		0.35	372603 3232	<b>234,-</b>
TS 40/40	50- 68	40	40	80	-	S...40-41	Yes	Yes		0.70	372603 4040	<b>258,-</b>
TS 50/50	68- 90	50	55	100	50	S...50	Yes	Yes		1.5	372603 5050	<b>282,-</b>
TS 50/63	90-120	50	72	80	60	S...63	Yes	Yes	Yes	2.0	372603 5063	<b>282,-</b>
TS 63/63	90-120	63	72	125	63	S...63	Yes	Yes	Yes	3.0	372603 6363	<b>349,-</b>
TS 80/80	120-160 160-200	80	95	140	75	S...80 S...90	Yes	Yes	Yes	5.3	372603 8080	<b>430,-</b>

1138

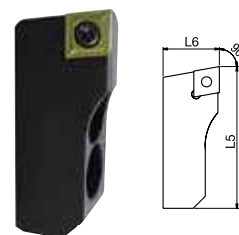
## D'ANDREA® MHD insert holder SSCC / SMCC / SSSC

- For twin-cutter boring bars
- Type SSTC insert holders available on request

### SSCC

Type	D mm	L6 mm	L5 mm	for indexable inserts	Screw	Wrench size	art.no.	€
SSCC 16	18 - 22	8	15	CC..0602..	TS25	T 08	<b>372610 0016</b>	<b>64,70</b>
SSCC 20	22 - 28	9.5	19	CC..0602..	TS25	T 08	372610 0020	<b>69,10</b>
SSCC 25	28 - 38	12.5	23	CC..0602..	TS25	T 08	372610 0025	<b>71,20</b>
SSCC 32	38 - 50	15	32	CC..0602..	TS25	T 08	372610 0032	<b>74,50</b>
SSCC 33	38 - 50	15	32	CC..09T3..	TS4	T 15	372610 0033	<b>74,50</b>
SSCC 40	50 - 68	19	40	CC..09T3..	TS4	T 15	372610 0040	<b>77,70</b>
SSCC 41	50 - 68	19	40	CC..1204..	TS5	T 25	372610 0041	<b>77,70</b>
SSCC 50	68 - 90	22	54	CC..1204..	TS5	T 25	372610 0050	<b>79,90</b>
SSCC 63	90 - 120	27	70.5	CC..1204..	TS5	T 25	372610 0063	<b>139,50</b>
SSCC 80	120 - 160	32	94.5	CC..1204..	TS5	T 25	372610 0080	<b>156,-</b>
SSCC 90	160 - 500	32	130	CC..1204..	TS5	T 25	372610 0090	<b>201,-</b>

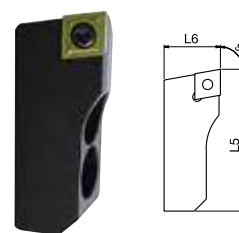
1138



### SMCC

Type	D mm	L6 mm	L5 mm	for indexable inserts	Screw	Wrench size	art.no.	€
SMCC 25	28 - 38	12.3	23	CC..0602..	TS25	T 08	<b>372612 0025</b>	<b>71,20</b>
SMCC 32	38 - 50	14.8	32	CC..0602..	TS25	T 08	372612 0032	<b>74,50</b>
SMCC 33	38 - 50	14.8	32	CC..09T3..	TS4	T 15	372612 0033	<b>74,50</b>
SMCC 40	50 - 68	18.7	40	CC..09T3..	TS4	T 15	372612 0040	<b>77,70</b>
SMCC 41	50 - 68	18.7	40	CC..1204..	TS5	T 25	372612 0041	<b>77,70</b>
SMCC 50	68 - 90	21.7	54	CC..1204..	TS5	T 25	372612 0050	<b>79,90</b>
SMCC 63	90 - 120	26.7	70.5	CC..1204..	TS5	T 25	372612 0063	<b>139,50</b>
SMCC 80	120 - 160	31.7	94.5	CC..1204..	TS5	T 25	372612 0080	<b>156,-</b>
SMCC 90	160 - 500	31.7	130	CC..1204..	TS5	T 25	372612 0090	<b>201,-</b>

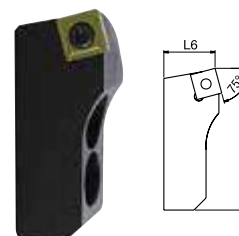
1138



### SSSC

Type	D mm	L6 mm	L5 mm	for indexable inserts	Screw	Wrench size	art.no.	€
SSSC 32	38 - 50	15	32.5	SC..09T3..	TS4	T 15	<b>372614 0032</b>	<b>74,50</b>
SSSC 40	50 - 68	19	40	SC..09T3..	TS4	T 15	372614 0040	<b>77,70</b>
SSSC 50	68 - 90	22	54	SC..1204..	TS5	T 25	372614 0050	<b>79,90</b>
SSSC 63	90 - 120	27	70.5	SC..1204..	TS5	T 25	372614 0063	<b>139,50</b>
SSSC 80	120 - 160	32	94.5	SC..1204..	TS5	T 25	372614 0080	<b>156,-</b>
SSSC 90	160 - 500	32	130	SC..1204..	TS5	T 25	372614 0090	<b>201,-</b>

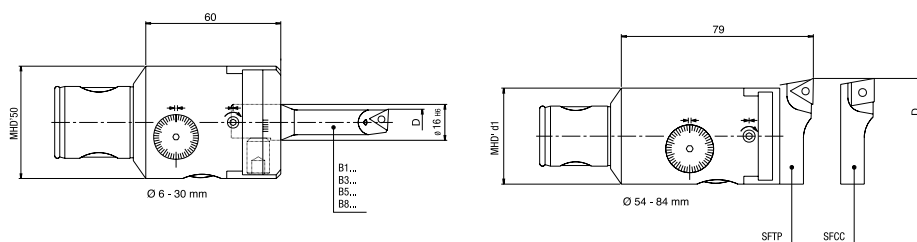
1138



## D'ANDREA® MHD micrometric boring bar system



- TRM boring heads and micrometric boring bars ensure a tolerance of IT6 with an optimum surface finish quality.
- Settings with a radial correction of 1 µm can easily be read off the Vernier scale and executed directly on the machine.



### TRM 50/50 high-precision boring head, Ø 6 - 84 mm

Type	D mm	L mm	Weight kg	SF..	art.no.	€
TRM 50/50	6-84	60	1.0	50	<b>372801 5050</b>	<b>699,-</b>

1138





**High-precision boring head, digital, TRE50/50 Ø 6-110 mm**

- Multifunctional button for the functions "On", "Reset" and switching between "mm/inch"
- **Display resolution Ø 0.002 mm**
- Energy-saving function, automatic display switch-off and saving last value after 30 seconds
- Internal coolant supply
- **Protection class IP67**

Type	D mm	L mm	Weight kg	SF..	art.no.	€
TRE 50/50	6-110	61	1.0	50	<b>372802 0050</b>	<b>1.269,-</b>

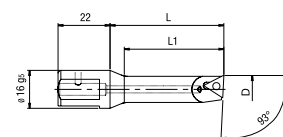
1138

**Boring bar**

- For TRM 50/50 and TRM 50HS high-precision boring heads

Type	D mm	L mm	L1 mm	for indexable inserts	Screw	Wrench size	art.no.	€
B3,06	6-8	29	21	WCGT 0201..	TS 21	T 06	<b>372807 0006</b>	<b>74,50</b>
B3,08	8-10	36	28	WCGT 0201..	TS 21	T 06	372807 0008	<b>77,70</b>
B3,10	10-12	43	35	TPGX 0902..	CS250T	T 08	372807 0010	<b>83,10</b>
B3,11	11-13	48	40	TPGX 0902..	CS250T	T 08	372807 0011	<b>85,30</b>
B3,12	12-14	48	42	TPGX 0902..	CS250T	T 08	372807 0012	<b>88,50</b>
B3,14	14-16	52	50	TPGX 0902..	CS250T	T 08	372807 0014	<b>91,80</b>
B3,16	16-18	58	50	TPGX 0902..	CS250T	T 08	372807 0016	<b>95,-</b>
B3,18	18-22	63	-	TPGX 0902..	CS250T	T 08	372807 0018	<b>98,30</b>
B3,22	22-30	68	-	TPGX 0902..	CS250T	T 08	372807 0022	<b>101,50</b>

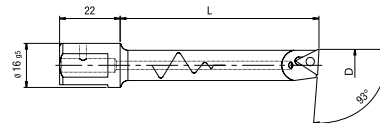
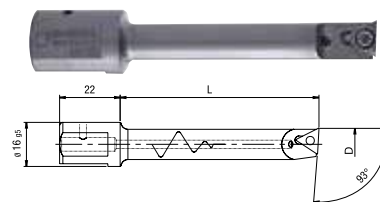
1138

**Low-vibration boring bar**

- For TRM 50/50 and TRM 50HS high-precision boring heads

Type	D mm	L mm	for indexable inserts	Screw	Wrench size	art.no.	€
B5,06	6-8	36	WCGT 0201..	TS21	T 06	<b>372808 0006</b>	<b>188,50</b>
B5,08	8-10	45	WCGT 0201..	TS21	T 06	372808 0008	<b>209,-</b>
B5,10	10-12	60	TPGX 0902..	CS250T	T 08	372808 0010	<b>229,-</b>
B5,12	12-14	72	TPGX 0902..	CS250T	T 08	372808 0012	<b>254,-</b>
B5,14	14-16	84	TPGX 0902..	CS250T	T 08	372808 0014	<b>276,-</b>
B5,16	16-18	96	TPGX 0902..	CS250T	T 08	372808 0016	<b>321,-</b>

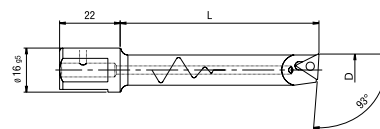
1138

**Solid carbide boring bar (approx. 8xD)**

- For TRM 50/50 and TRM 50HS high-precision boring heads

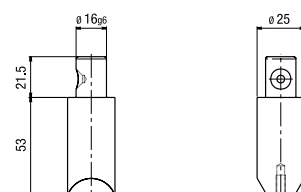
Type	D mm	L mm	for indexable inserts	Screw	Wrench size	art.no.	€
B8,06	6-8	45	WCGT 0201..	TS21	T 06	<b>372809 0006</b>	<b>335,-</b>
B8,08	8-10	60	WCGT 0201..	TS21	T 06	372809 0008	<b>346,-</b>
B8,10	10-12	75	TPGX 0902..	CS250T	T 08	372809 0010	<b>370,-</b>
B8,12	12-14	90	TPGX 0902..	CS250T	T 08	372809 0012	<b>410,-</b>
B8,14	14-16	105	TPGX 0902..	CS250T	T 08	372809 0014	<b>450,-</b>
B8,16	16-18	120	TPGX 0902..	CS250T	T 08	372809 0016	<b>495,-</b>

1138

**P 25.63 base holder**

Type	suitable for	Weight kg	art.no.	€
P 25,63	SFTP 25 and SFTP 32	0.3	<b>372815 2563</b>	<b>69,10</b>

1138



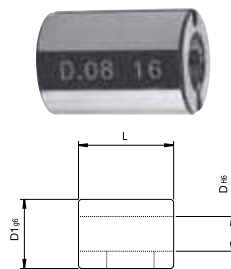
Continued on next page &gt;&gt;&gt;



**Reducing bushes, straight**

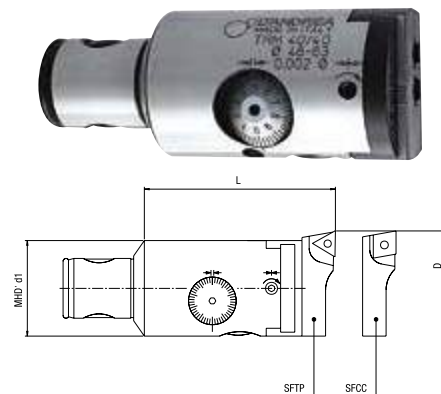
• For TRM 50/50 and TRM 50HS high-precision boring heads

Type	L mm	D H6 mm	D1 g6 mm	art.no.	€
D04,16	23	4	16	<b>370620 0004</b>	<b>52,70</b>
D08,16	22	8	16	370620 0008	53,50
D10,16	23	10	16	370620 0010	52,70
D12,16	23	12	16	370620 0012	53,50
1138					



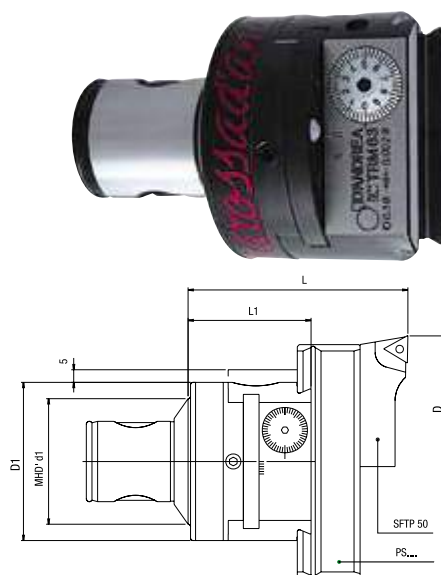
**TRM high-precision boring head, Ø 18 - 63**

Type	D mm	MHD'd1	L mm	L7 mm	SF..	Weight kg	art.no.	€
TRM 16/16	18 - 23	16	34	1	16	0.05	<b>372810 1616</b>	<b>485,-</b>
TRM 20/20	22 - 29	20	40	2	20	0.1	372810 2020	519,-
TRM 25/25	28 - 38	25	50	2	25	0.2	372810 2525	539,-
TRM 32/32	35.5 - 50	32	63	3	32	0.35	372810 3232	579,-
TRM 40/40	48 - 63	40	80	4	40	0.7	372810 4040	609,-
1138								



**TRM high-precision boring head, Ø 77 - 500**

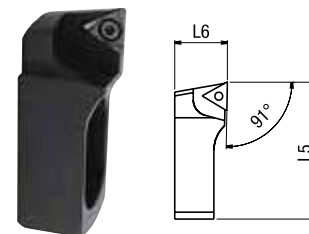
Type	D mm	MHD'd1	D1 mm	L mm	L1 mm	PS..	Weight kg	art.no.	€
TRM 50/63	77-100, 95-125	50	63	87.5	49	11.30, 12.30	1.7 / 1.8	<b>372832 5063</b>	<b>769,-</b>
TRM 63/63	77-100, 95-125	63	63	87.5	49	11.30, 12.30	2.0 / 2.1	372832 6363	769,-
TRM 50/80	95-140, 140-160	50	80	96.5	58	12.30, 13.30	2.6 / 2.8	372832 5080	819,-
TRM 80/80	95-140, 140-160	80	80	96.5	58	12.30, 13.30	3.1 / 3.3	372832 8080	819,-
TRM 80/125	135-210, 205-310, 305-410, 405-500	80	125	114	63	11.40, 12.40, 13.40, 14.40	7.2 / 8.1 / 9.2 / 10.3	372832 8012	1.399,-
1138									



**SFTP insert holder**

• For TRM high-precision boring head

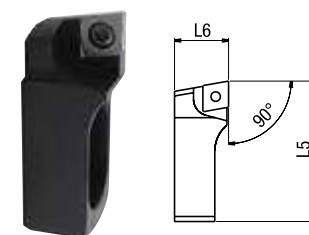
Type	D mm	L6 mm	L5 mm	for indexable inserts	Screw	Wrench size	art.no.	€
SFTP 25	28 - 38	10	26.5	TPGX 0902..	CS250T	T 08	<b>372825 0025</b>	<b>71,20</b>
SFTP 32	35.5 - 50	11.5	34.5	TPGX 0902..	CS250T	T 08	372825 0032	74,50
SFTP 40	48 - 63	14	44	TPGX 1103..	CS300890T	T 08	372825 0040	77,70
SFTP 50	54 - 84	19	52	TPGX 1103..	CS300890T	T 08	372825 0050	79,90
1138								



**SFCC insert holder**

• For TRM high-precision boring head

Type	D mm	L6 mm	L5 mm	for indexable inserts	Screw	Wrench size	art.no.	€
SFCC 16	18 - 23	8	17	CC.. 0602..	TS25	T 08	<b>372827 0016</b>	<b>64,70</b>
SFCC 20	22 - 29	8.5	21	CC.. 0602..	TS25	T 08	372827 0020	69,10
SFCC 25	28 - 38	10	26.5	CC.. 0602..	TS25	T 08	372827 0025	71,20
SFCC 32	35.5 - 50	11.5	34.5	CC.. 0602..	TS4	T 15	372827 0032	74,50
SFCC 40	48 - 63	14	44	CC.. 0913..	TS4	T 15	372827 0040	77,70
SFCC 50	54 - 84	19	52	CC.. 0913..	TS4	T 15	372827 0050	79,90
1138								



## D'ANDREA® MHD base holder



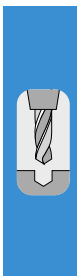
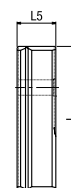
421

### PS base holder

- For TRM high-precision boring heads (insert holder SF.. 50)

Type	L5 mm	L mm	L6 mm	Weight kg	art.no.	€
PS 31,24	14.5	75	24	0.2	<b>372835 3124</b>	<b>79,90</b>
PS 11,30	25	75	30.5	0.4	372835 1130	<b>96,20</b>
PS 12,30	25	93	30.5	0.5	372835 1230	<b>105,-</b>
PS 13,30	25	135	30,5	0.7	372835 1330	<b>152,-</b>
PS 11,40	40	133	40	1.5	372835 1140	<b>156,-</b>
PS 12,40	40	200	40	2.4	372835 1240	<b>176,-</b>
PS 13,40	40	300	40	3.5	372835 1340	<b>243,-</b>
PS 14,40	40	400	40	4.6	372835 1440	<b>355,-</b>

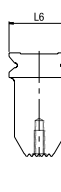
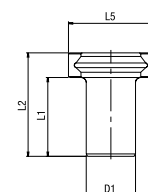
1138



### P.. base holder

Type	for indexable inserts	D1 mm	L1 mm	L2 mm	L5 mm	L6 mm	Weight kg	art.no.	€
P 02,30	SFCC/SFTP 25-32	25	40	52.5	43	30.5	0.3	<b>372820 0230</b>	<b>79,90</b>
P 03,30	SFCC/SFTP 25-32	25	70	82.5	43	30.5	0.4	372820 0330	<b>87,50</b>
P 04,30	SFCC/SFTP 25-32	27	115	127.5	43	30.5	0.7	372820 0430	<b>126,50</b>
P 02,40	SFCC/SFTP 32-40	32	69	86	56	40	0.7	372820 0240	<b>107,-</b>
P 03,40	SFCC/SFTP 32-40	32	114	131	56	40	1.0	372820 0340	<b>116,-</b>
P 04,40	SFCC/SFTP 32-40	38	189	206	56	40	2.0	372820 0440	<b>172,-</b>

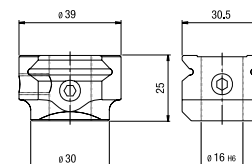
1138



### P 20.30 base holder

Type	suitable for boring bars mm	Weight kg	art.no.	€
P 20,30	06, 08, 11, 16, 22 mm	0.2	<b>372837 2030</b>	<b>76,60</b>

1138



### CW 32 counterweight

Type	art.no.	€
CW 32	<b>372836 0032</b>	<b>35,60</b>

1138



**D'ANDREA® Modular tool system, Ø 6-110 mm**

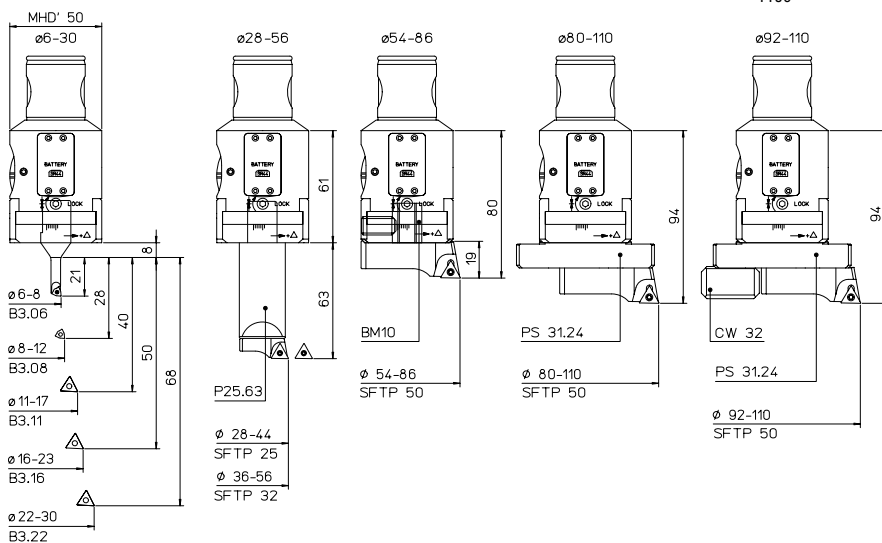


- **modular MHD interface**
- Multifunctional button for the functions "On", "Reset" and switching between "mm/inch"
- **Display resolution Ø 0.002 mm**
- Energy-saving function, automatic display switch-off and saving last value after 30 seconds
- Internal coolant supply
- **Protection class IP67**

Ø 6-110 mm

Contents	art.no.	€
1 TRE 50/50: B3.06 / B3.08 / B3.11 / B3.16 / B3.22 (1 of each) 1 P25.63 SFTP25 / SFTP32 / SFTP50 (1 of each) 1 PS 31.24 5 TPGX090202L TPGX110302L 2 WCGT020102L 1 CW32	<b>373002</b> 0001	<b>1.989,-</b>

1138



**D'ANDREA® Modular tool system, Ø 6 - 108 mm**



- **K01 and TRM 50/50 sets**

Ø 6 - 108 mm

Contents	art.no.	€
1 TRM 50/50: B3.06 / B3.08 / B3.11 / B3.16 / B3.22 (1 of each) 1 P25.63 SFTP25 / SFTP32 / SFTP50 (1 of each) 1 PS 31.24 5 TPGX090202L 1 TPGX110302L 2 WCGT020102L 1 CW32	<b>373001</b> 0001	<b>1.339,-</b>

1138



**D'ANDREA® Modular tool system, Ø 6 - 125 mm**



• K01, TRM 50/63 and TRM 63/63 sets

Ø 6 - 125 mm

Contents			art.no.	€
1 TRM 50/63: B3.06 / B3.08 / B3.11 / B3.16 / B3.22 (1 of each) P03.30 (1 of each) 1 TPGX110302L	B3.06 / B3.08 / B3.11 / B3.16 / B3.22 (1 of each) 1 PS 11.30 SFTP25 / SFTP32 / SFTP50 (1 of each)	P20.30 / P02.30 / 5 TPGX090202L	<b>373001 0002</b>	<b>1.599,-</b>
1 TRM 63/63: B3.06 / B3.08 / B3.11 / B3.16 / B3.22 (1 of each), P20.30 / P02.30 / P03.30, 1 PS 11.30 (1 of each), SFTP25 / SFTP32 / SFTP50 (1 of each), 5 TPGX090202L, 1 TPGX110302L, 2 WCGT020102L			<b>373001 0003</b>	<b>1.599,-</b>



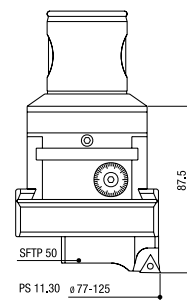
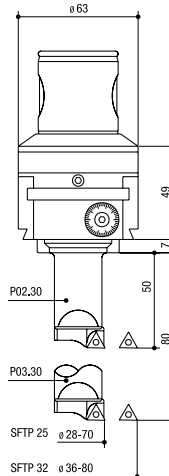
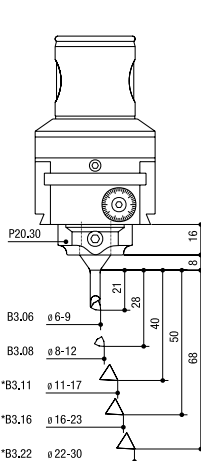
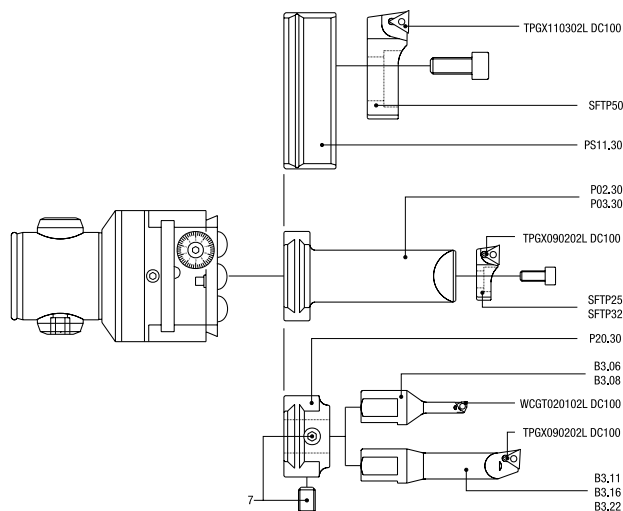
373001 0003

1138

Ø 6 - 30

Ø 28 - 80

Ø 77 - 125



**D'ANDREA® Modular tool system, Ø 6 - 220 mm**



• K01, TRM 50/80 and TRM 80/80 sets

Ø 6 - 220 mm

Contents			art.no.	€
1 TRM 50/80: B3.06 / B3.08 / B3.11 / B3.16 / B3.22 (1 of each) P03.30 / P04.30 (1 of each) 5 TPGX090202L 1 TPGX110302L 2 WCGT020102L	B3.06 / B3.08 / B3.11 / B3.16 / B3.22 (1 of each) PS 12.30 / PS13.30 (1 of each) SFTP25 / SFTP32 / SFTP50 (1 of each)	P20.30 / P02.30 (1 of each)	<b>373001 0004</b>	<b>1.909,-</b>
1 TRM 80/80: B3.06 / B3.08 / B3.11 / B3.16 / B3.22 (1 of each), P20.30 / P02.30 (1 of each), P03.30 / P04.30 (1 of each), PS 12.30 / PS 13.30 (1 of each), SFTP25 / SFTP32 / SFTP50 (1 of each), 5 TPGX090202L, 1 TPGX110302L, 2 WCGT020102L			<b>373001 0005</b>	<b>1.909,-</b>



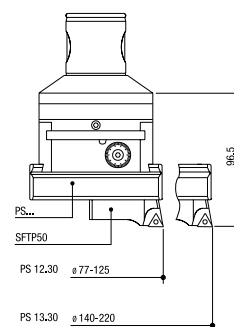
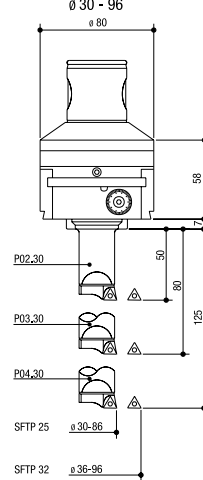
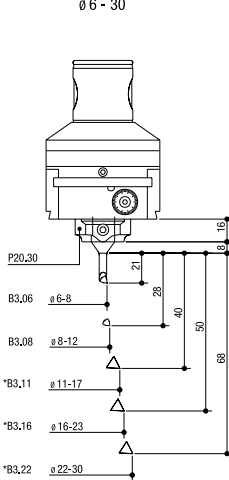
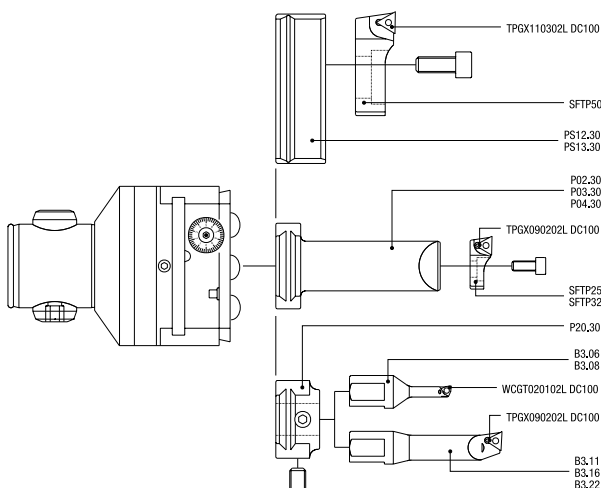
373001 0005

1138

Ø 6 - 30

Ø 30 - 96

Ø 95 - 220



## D'ANDREA® ISO indexable cutting inserts



### Indexable inserts for reaming and line boring

- **DP 300** uncoated, roughing and finishing, low-carbon steel, stainless steel
- **DK 100** uncoated, roughing and finishing, aluminium alloys, cast iron
- **DC 100** uncoated, finishing, alloyed steel, cast iron
- **DC 100T** coated, finishing, alloyed steel, stainless steel, cast iron
- **D25 CBN** cubic boron nitride (one corner tipped), finishing, steel with a hardness over 50 HRC and for interrupted cutting
- **D20 MDC** diamond, finishing, aluminium alloys, non-ferrous metals
- **DP 100R** coated, roughing, low-carbon steel, stainless steel

### WCGT

- Cermet

ISO designation		ISO	<b>Cermet, DC 100</b>	
			art.no.	€
WCGT 020102 L	10	<b>373503</b>	0569	16,20
WCGT 020104 L	10	373503	0669	16,20

1138



### TPGX

ISO designation		ISO	<b>DP 300</b>	€	ISO	<b>DK 100</b>	€	ISO	<b>Cermet, DC 100</b>	€		
			art.no.			art.no.			art.no.			
TPGX 090202 L	10	<b>373507</b>	2004	11,80	10	<b>373507</b>	2010	11,80	10	<b>373507</b>	2069	13,35
TPGX 090204 L	10	373507	2104	11,80	10	373507	2110	11,80	10	373507	2169	13,35
TPGX 110302 L	10	373507	2304	12,75	10	373507	2310	12,75	10	373507	2369	14,35
TPGX 110304 L	10	373507	2404	12,75	10	373507	2410	12,75	10	373507	2469	14,35

1138

1138

1138



### TPGX

ISO designation		ISO	<b>Cermet, DC 100T</b>	€	ISO	<b>D25 CBN</b>	€	ISO	<b>D20 MDC, diamond</b>	€		
			art.no.			art.no.			art.no.			
TPGX 090202 L	10	<b>373507</b>	2071	14,35	1	<b>373507</b>	2073	79,40	1	<b>373507</b>	2075	149,50
TPGX 090204 L	10	373507	2171	14,35	1	373507	2173	79,40	1	373507	2175	149,50
TPGX 110302 L	10	373507	2371	15,40	1	373507	2373	79,40	1	373507	2375	149,50
TPGX 110304 L	10	373507	2471	15,40	1	373507	2473	79,40	1	373507	2475	149,50

1138

1138

1138



### CCMT

- CVD coated

ISO designation		ISO	<b>DP 100 R</b>	€
			art.no.	
CCMT 09T308	10	<b>373509</b>	3729	8,25
CCMT 120404	10	373509	4029	11,50
CCMT 120408	10	373509	4129	11,50

1138



### Clamping screws

Designation	Dimensions	Wrench size	for indexable inserts		art.no.	€
TS 21	M 2 x 0.4	T06	WCGT 0201..	10	<b>373205</b>	0001 3,31
CS 250 T	M 2.5 x 0.45	T08	TPGX 0902..	10	373205	0002 3,31
CS 300890 T	M 3 x 0.5	T08	TPGX 1103..	10	373205	0003 3,31
TS 4	M 4 x 0.7	T15	CCMT 09T3.. SCMT 09T3..	10	373205	0005 3,31
TS 5	M 5 x 0.8	T25	CCMT 1204.. SCMT 1204..	10	373205	0006 3,31

1138



**osborn Novoflex-B honing tool**

- Robust, self-centring honing tool for smooth grinding processes
- Flexible brush design ensures ideal adjustment of the abrasive balls to the surface
- For chamfering and finishing
- Can also be used in non-circular bores
- For use on hand-held drills, honing machines and automatic machines
- For a uniform, fine-ground surface
- Silicon carbide, SiC
- Recommended speed: 350 to 700 rpm

**Only for use with  
oil or emulsion**


D mm	Bore hole Ø mm	A mm	L mm	D1 mm	Grain 120		Grain 180	
					art.no.	€	art.no.	€
9	8	50	200	3.7	<b>627004 0009</b>	<b>26,70</b>	<b>627005 0009</b>	<b>26,70</b>
10	9	50	200	3.7	627004 0010	27,70	627005 0010	27,80
11	10	60	200	3.7	627004 0011	28,30	627005 0011	28,30
12	11	60	200	3.7	627004 0012	28,70	627005 0012	28,70
13	12	60	200	3.7	627004 0013	29,30	627005 0013	29,30
15.5	14	60	200	3.7	627004 0155	29,90	627005 0155	29,90
18	16	60	200	4.6	627004 0018	31,90	627005 0018	31,90
20	18	60	200	4.6	627004 0020	32,40	627005 0020	32,40
22	20	70	200	4.6	627004 0022	33,-	627005 0022	33,10
25	22	70	200	4.6	627004 0025	34,10	627005 0025	34,10
27	24	70	200	5.1	627004 0027	35,40	627005 0027	35,40
28	25	70	200	5.1	627004 0028	36,60	627005 0028	36,60
30	27	70	200	5.1	627004 0030	37,70	627005 0030	37,70
32	29	70	200	5.1	627004 0032	38,90	627005 0032	38,90
35	32	70	200	5.1	627004 0035	39,90	627005 0035	39,90
38	35	70	200	5.7	627004 0038	42,90	627005 0038	42,90
41	38	70	200	5.7	627004 0041	44,60	627005 0041	44,60
45	41	70	200	5.7	627004 0045	46,60	627005 0045	46,60
48	45	70	200	5.7	627004 0048	48,50	627005 0048	48,50
51	48	70	200	6.5	627004 0051	50,30	627005 0051	50,40
54	51	70	200	6.5	627004 0054	51,90	627005 0054	51,90
57	54	70	200	6.5	627004 0057	52,40	627005 0057	52,40
60	57	70	200	7.3	627004 0060	53,40	627005 0060	53,40
64	60	70	200	7.3	627004 0064	54,50	627005 0064	54,50

6120

6120





## osborn Cylindrical tube brush with grinding bristles

- For internal machining of bores and finishing non-ferrous metals, steel and cast-iron parts
- Silicon carbide, SiC
- Particularly suitable for deburring transverse bores, control components, O-ring recesses and straight bores
- We recommend bristles that are 10 - 15 % wider than the bore
- For cleaning, smoothing, deburring
- Unit prices when purchased in packs



D mm	A mm	L mm	D1 mm	Grain 320		Grain 120		Grain 80	
				art.no.	€	art.no.	€	art.no.	€
6	50	125	3.0	625001 0006	11,45	625002 0006	11,45		
8	50	125	3.0	625001 0008	11,45	625002 0008	11,45		
10	50	125	4.0	625001 0010	9,45	625002 0010	9,45	625003 0010	9,45
13	50	125	4.0	625001 0013	9,65	625002 0013	9,65	625003 0013	9,65
16	50	125	5.0	625001 0016	10,10	625002 0016	10,10	625003 0016	10,10
19	65	125	5.0	625001 0019	10,35	625002 0019	10,35	625003 0019	10,35
22	65	125	5.5	625001 0022	10,45	625002 0022	10,45	625003 0022	10,45
25	65	125	5.5	625001 0025	10,75	625002 0025	10,75	625003 0025	10,75
32	65	125	6.0	625001 0032	12,95	625002 0032	12,95	625003 0032	12,95
38	65	125	6.0	625001 0038	13,80	625002 0038	13,80	625003 0038	13,80
50	65	125	6.0	625001 0050	15,40	625002 0050	15,40	625003 0050	15,40
				6120		6120		6120	



## osborn HELITUF® interior brush

- Particularly suitable for cleaning and deburring threaded bores
- Also for brushing edges and longitudinal recesses e.g. for keyways
- Twist-fastened, crimped genuine OSBORN wire, Ø 0.13 mm
- **HELITUF®** brushes are very dense internal brushes for mechanical and manual use
- For cleaning, deburring, brushing
- Unit prices when purchased in packs



### Individual

- Dimension D refers to the bore diameter

D mm	A mm	L mm	D1 mm	art.no.	€
8	25	89	approx. 3.18	626001 0008	5,60
10	25	89	approx. 3.18	626001 0010	5,95
13	25	89	approx. 3.18	626001 0013	6,25
16	25	89	approx. 3.18	626001 0016	6,75
22	25	89	approx. 3.18	626001 0022	7,20
29	25	89	approx. 3.18	626001 0029	7,95
					6120

### Set

- 12 brushes, 2 holders

Contents		art.no.	€	
Set of brushes: diameter 10, 11, 13, 14, 16, 18, 19, 21, 22, 24, 25, 29 mm		627002 1000	145,-	
				6120

### Holder

- Tapered shank hole on one side and either an external or internal thread on the other
- Can be used singly or screwed together up to an overall length of 225 mm including the brush

D1 mm	L mm	Type	art.no.	€	
5	90	External thread	627002 0005	26,70	
6	90	Internal thread	627002 0006	26,70	
					6120



# DRILLING TOOLS

# TECHNICAL



Cutting data

Usage recommendations

Machining notes

Type descriptions

Systems overviews

Tapping hole tables

Tolerances

Fits





## Centring drills and Step centring drills HSS-E

• Please adjust these guideline values according to clamping operation and machine set-up!

100101....  
100141....  
100109....  
100149....

100103....  
100104....  
100107....  
100105....

102214....  
102215....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min Uncoated	Cutting speed Vc m/min Coated	Feed f in mm/rev in relation to drill bit diameter in mm				
							2	3	6	10	16
P	Machining steel	Up to 700	9 SMn 28	1.0715	30 - 45	35 - 60	0,08	0,1	0,2	0,3	0,4
	Unalloyed structural steel	Up to 700	St-52	1.0052	30 - 45	35 - 60	0,08	0,1	0,2	0,3	0,4
	Structural steel	700 - 950	Ck45	1.1191	30 - 45	35 - 60	0,08	0,1	0,2	0,3	0,4
	Tempering steel	500 - 950	42 CrMo4	1.7225	15 - 25	22 - 40	0,05	0,07	0,14	0,21	0,28
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	10 - 15	15 - 20	0,05	0,07	0,14	0,21	0,28
	Tempering steel	950 - 1300	43CrMo4	1.3563	10 - 15	15 - 20	0,05	0,07	0,14	0,21	0,28
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	10 - 15	15 - 20	0,05	0,07	0,14	0,21	0,28
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	10 - 15	15 - 20	0,05	0,07	0,14	0,21	0,28
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	6 - 10	10 - 15	0,04	0,06	0,12	0,18	0,25
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	6 - 10	10 - 15	0,04	0,06	0,12	0,18	0,25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	15 - 25	20 - 35	0,08	0,1	0,2	0,3	0,4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	10 - 15	15 - 20	0,06	0,07	0,15	0,25	0,35
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	60 - 90	70 - 90	0,1	0,12	0,18	0,3	0,35
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	35 - 50	40 - 60	0,1	0,12	0,18	0,3	0,35
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	40 - 50	50 - 60	0,1	0,12	0,18	0,3	0,35
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	40 - 50	50 - 60	0,1	0,12	0,18	0,3	0,35
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	40 - 50	50 - 60	0,1	0,12	0,18	0,3	0,35
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	40 - 50	50 - 60	0,1	0,12	0,18	0,3	0,35
	Thermoplastic		PVC		110 - 140	100 - 130	0,12	0,14	0,2	0,35	0,45
	Thermoset		Melamin		110 - 140	100 - 130	0,12	0,14	0,2	0,35	0,45
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	6 - 10	10 - 15	0,04	0,06	0,12	0,18	0,25
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	5 - 6	8 - 12	0,03	0,05	0,1	0,16	0,22

## Solid carbide centring drills



• Please adjust these guideline values according to clamping operation and machine set-up!

100501....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						2	3	6	10	16
P	Machining steel	Up to 700	9 SMn 28	1.0715	70 - 80	0,1	0,12	0,22	0,33	0,45
	Unalloyed structural steel	Up to 700	St-52	1.0052	70 - 80	0,1	0,12	0,22	0,33	0,45
	Structural steel	700 - 950	Ck45	1.1191	60 - 75	0,1	0,12	0,22	0,33	0,45
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 75	0,1	0,12	0,22	0,33	0,45
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	50 - 60	0,07	0,08	0,15	0,23	0,31
	Tempering steel	950 - 1300	43CrMo4	1.3563	25 - 40	0,06	0,07	0,13	0,2	0,27
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	25 - 40	0,06	0,07	0,13	0,2	0,27
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	25 - 40	0,06	0,07	0,13	0,2	0,27
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	20 - 30	0,06	0,08	0,15	0,2	0,3
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	20 - 30	0,06	0,08	0,15	0,2	0,3
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	50 - 60	0,1	0,12	0,22	0,33	0,45
	Ductile iron	Up to 280 HB	GGG 60	0.7060	35 - 50	0,08	0,1	0,17	0,3	0,4
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	100 - 150	0,12	0,15	0,2	0,25	0,4
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	70 - 90	0,12	0,15	0,2	0,25	0,4
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	70 - 90	0,12	0,15	0,2	0,25	0,4
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	70 - 90	0,12	0,15	0,2	0,25	0,4
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	70 - 90	0,12	0,15	0,2	0,25	0,4
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	70 - 90	0,12	0,15	0,2	0,25	0,4
	Thermoplastic		PVC		150 - 200	0,13	0,15	0,25	0,4	0,5
	Thermoset		Melamin		150 - 200	0,13	0,15	0,25	0,4	0,5
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 30	0,06	0,08	0,15	0,2	0,3
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 25	0,05	0,07	0,13	0,2	0,27

## NC spotting drill HSS-E



• Please adjust these guideline values according to clamping operation and machine set-up!

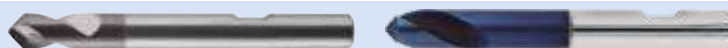
100130....  
100131....  
100120....

100121....  
100132....  
100122....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min Uncoated	Cutting speed Vc m/min Coated	Feed f in mm/rev in relation to drill bit diameter in mm					
							2	3	6	10	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	30 - 45	35 - 60	0,08	0,1	0,2	0,3	0,4	0,45
	Unalloyed structural steel	Up to 700	St-52	1.0052	30 - 45	35 - 60	0,08	0,1	0,2	0,3	0,4	0,45
	Structural steel	700 - 950	Ck45	1.1191	25 - 30	35 - 50	0,08	0,1	0,2	0,3	0,4	0,45
	Tempering steel	500 - 950	42 CrMo4	1.7225	25 - 30	35 - 50	0,08	0,1	0,2	0,3	0,4	0,45
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	15 - 25	22 - 40	0,05	0,07	0,14	0,21	0,28	0,33
	Tempering steel	950 - 1300	43CrMo4	1.3563	10 - 15	15 - 20	0,05	0,07	0,14	0,21	0,28	0,33
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	10 - 15	15 - 20	0,05	0,07	0,14	0,21	0,28	0,33
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	10 - 15	15 - 20	0,05	0,07	0,14	0,21	0,28	0,33
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	6 - 10	10 - 15	0,04	0,06	0,12	0,18	0,25	0,3
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	6 - 10	10 - 15	0,04	0,06	0,12	0,18	0,25	0,3
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	15 - 25	20 - 35	0,08	0,1	0,2	0,3	0,4	0,45
	Ductile iron	Up to 280 HB	GGG 60	0.7060	10 - 15	15 - 20	0,06	0,07	0,15	0,25	0,35	0,4
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	60 - 90	70 - 90	0,1	0,12	0,18	0,3	0,35	0,4
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	35 - 50	40 - 60	0,1	0,12	0,18	0,3	0,35	0,4
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	40 - 50	50 - 60	0,1	0,12	0,18	0,3	0,35	0,4
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	40 - 50	50 - 60	0,1	0,12	0,18	0,3	0,35	0,4
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	40 - 50	50 - 60	0,1	0,12	0,18	0,3	0,35	0,4
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	40 - 50	50 - 60	0,1	0,12	0,18	0,3	0,35	0,4
	Thermoplastic		PVC		110 - 140	100 - 130	0,12	0,14	0,2	0,35	0,45	0,5
	Thermoset		Melamin		110 - 140	100 - 130	0,12	0,14	0,2	0,35	0,45	0,5
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	6 - 10	10 - 15	0,04	0,06	0,12	0,18	0,25	0,3
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	5 - 6	8 - 12	0,03	0,05	0,1	0,16	0,22	0,27



## Solid carbide NC spotting drill



• Please adjust these guideline values according to clamping operation and machine set-up!


100520....  
100530....  
100540....  
100550....  
100560....

100570....  
100571....  
100572....  
100580....  
100581....

100582....  
100583....  
100584....  
100585....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min Uncoated	Cutting speed Vc m/min Coated	Feed f in mm/rev in relation to drill bit diameter in mm					
							2	3	6	10	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 100	100 - 120	0,1	0,12	0,22	0,33	0,45	0,5
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 100	100 - 120	0,1	0,12	0,22	0,33	0,45	0,5
	Structural steel	700 - 950	Ck45	1.1191	60 - 90	80 - 110	0,1	0,12	0,22	0,33	0,45	0,5
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 90	80 - 110	0,1	0,12	0,22	0,33	0,45	0,5
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	55 - 75	60 - 80	0,07	0,08	0,15	0,23	0,31	0,36
	Tempering steel	950 - 1300	43CrMo4	1.3563	30 - 50	40 - 60	0,06	0,07	0,13	0,2	0,27	0,32
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	30 - 50	40 - 60	0,06	0,07	0,13	0,2	0,27	0,32
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30 - 50	40 - 60	0,06	0,07	0,13	0,2	0,27	0,32
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	25 - 50	30 - 60	0,06	0,08	0,15	0,2	0,3	0,35
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	25 - 50	30 - 60	0,06	0,08	0,15	0,2	0,3	0,35
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	80 - 100	80 - 90	0,1	0,12	0,22	0,33	0,45	0,5
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60 - 90	70 - 90	0,08	0,1	0,17	0,3	0,4	0,45
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	100 - 180	150 - 200	0,12	0,15	0,2	0,25	0,4	0,45
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	100 - 180	150 - 200	0,12	0,15	0,2	0,25	0,4	0,45
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	90 - 120	110 - 140	0,12	0,15	0,2	0,25	0,4	0,45
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	90 - 120	110 - 140	0,12	0,15	0,2	0,25	0,4	0,45
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	90 - 120	110 - 140	0,12	0,15	0,2	0,25	0,4	0,45
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	90 - 120	110 - 140	0,12	0,15	0,2	0,25	0,4	0,45
	Thermoplastic		PVC		100 - 180	150 - 200	0,12	0,15	0,2	0,25	0,4	0,45
	Thermoset		Melamin		100 - 180	150 - 200	0,12	0,15	0,2	0,25	0,4	0,45
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 35	30 - 40	0,06	0,08	0,15	0,2	0,3	0,35
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	25 - 35	30 - 40	0,05	0,07	0,13	0,18	0,27	0,32
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	25 - 35	30 - 40	0,05	0,07	0,13	0,18	0,27	0,32




**NC spotting drill HYP-LDS**


• Please adjust these guideline values according to clamping operation and machine set-up!

100590....  
100592....

100594....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						3	4	6	8
P	Machining steel	Up to 700	9 SMn 28	1.0715	63 - 80	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Unalloyed structural steel	Up to 700	St-52	1.0052	63 - 80	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Structural steel	700 - 950	Ck45	1.1191	40 - 63	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Tempering steel	500 - 950	42 CrMo4	1.7225	40 - 63	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	32 - 50	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Tempering steel	950 - 1300	43CrMo4	1.3563	32 - 50	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	32 - 50	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	16 - 22	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	20 - 28	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	20 - 28	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	63 - 100	0,05 - 0,09	0,07 - 0,12	0,12 - 0,18	0,13 - 0,20
	Ductile iron	Up to 280 HB	GGG 60	0.6678	63 - 100	0,05 - 0,09	0,07 - 0,12	0,12 - 0,18	0,13 - 0,20
	Malleable cast iron	Up to 280 HB	GTS 55	0.7060	63 - 100	0,05 - 0,09	0,07 - 0,12	0,12 - 0,18	0,13 - 0,20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80 - 160	0,10 - 0,22	0,12 - 0,25	0,14 - 0,28	0,18 - 0,32
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 160	0,10 - 0,22	0,12 - 0,25	0,14 - 0,28	0,18 - 0,32
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	80 - 140	0,10 - 0,22	0,12 - 0,25	0,14 - 0,28	0,18 - 0,32
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	80 - 140	0,10 - 0,22	0,12 - 0,25	0,14 - 0,28	0,18 - 0,32
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	80 - 140	0,10 - 0,22	0,12 - 0,25	0,14 - 0,28	0,18 - 0,32
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	80 - 140	0,10 - 0,22	0,12 - 0,25	0,14 - 0,28	0,18 - 0,32
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	16 - 22	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	16 - 22	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	16 - 22	0,04 - 0,08	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						10	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	63 - 80	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Unalloyed structural steel	Up to 700	St-52	1.0052	63 - 80	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Structural steel	700 - 950	Ck45	1.1191	40 - 63	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Tempering steel	500 - 950	42 CrMo4	1.7225	40 - 63	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	32 - 50	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Tempering steel	950 - 1300	43CrMo4	1.3563	32 - 50	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	32 - 50	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	16 - 22	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	20 - 28	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	20 - 28	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	63 - 100	0,17 - 0,25	0,21 - 0,30	0,24 - 0,32	0,26 - 0,40
	Ductile iron	Up to 280 HB	GGLNiCr 35 2	0.6678	63 - 100	0,17 - 0,25	0,21 - 0,30	0,24 - 0,32	0,26 - 0,40
	Malleable cast iron	Up to 280 HB	GGG 60	0.7060	63 - 100	0,17 - 0,25	0,21 - 0,30	0,24 - 0,32	0,26 - 0,40
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80 - 160	0,22 - 0,36	0,25 - 0,40	0,32 - 0,48	0,40 - 0,60
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 160	0,22 - 0,36	0,25 - 0,40	0,32 - 0,48	0,40 - 0,60
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	80 - 140	0,22 - 0,36	0,25 - 0,40	0,32 - 0,48	0,40 - 0,60
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	80 - 140	0,22 - 0,36	0,25 - 0,40	0,32 - 0,48	0,40 - 0,60
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	80 - 140	0,22 - 0,36	0,25 - 0,40	0,32 - 0,48	0,40 - 0,60
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	80 - 140	0,22 - 0,36	0,25 - 0,40	0,32 - 0,48	0,40 - 0,60
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	16 - 22	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	16 - 22	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	16 - 22	0,10 - 0,18	0,12 - 0,21	0,16 - 0,28	0,20 - 0,34

## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101050....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	36	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Unalloyed structural steel	Up to 700	St-52	1.0052	28	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Structural steel	700 - 950	Ck45	1.1191	28	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Cast steel	Up to 950	GS 40	1.0416	28	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	36	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	18	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	36	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	28	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Ductile iron	Up to 280 HB	GGG 60	0.7060	23	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	23	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44



## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101055....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	35	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Structural steel	700 - 950	Ck45	1.1191	30	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	16	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	12	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	12	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	40	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	30	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Ductile iron	Up to 280 HB	GGG 60	0.7060	36	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	25	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
N	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	40	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	36	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Thermoset		Melamine		20	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	8	0.04 - 0.05	0.05 - 0.08	0.08 - 0.11	0.1 - 0.13	0.13 - 0.16
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	8	0.03 - 0.04	0.04 - 0.06	0.06 - 0.08	0.08 - 0.11	0.1 - 0.13

## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101052....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Unalloyed structural steel	Up to 700	St-52	1.0052	36	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Structural steel	700 - 950	Ck45	1.1191	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Cast steel	Up to 950	GS 40	1.0416	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	36	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	28	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	32	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	23	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	90	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4 - 0.5
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	55	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	45	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	36	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Thermoplastic		PVC		28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Thermoset		Melamine		18	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25



## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101051....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	40	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Structural steel	700 - 950	Ck45	1.1191	40	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	22	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	15	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	18	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	20	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	50	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	40	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	45	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	32	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
N	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	40	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	50	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	10	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	10	0.03 - 0.04	0.04 - 0.63	0.63 - 0.08	0.08 - 0.1	0.1 - 0.13
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	5	0.03 - 0.04	0.04 - 0.06	0.06 - 0.08	0.08 - 0.1	0.1 - 0.13

## ATORN® KSB-3 Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!  
• The specified values apply for application up to 3 x D

101085....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 10	10.1 - 12	12.1 - 14
P	Machining steel	Up to 700	9 SMn 28	1.0715	50 - 60	0.05 - 0.1	0.1 - 0.2	0.16 - 0.2	0.2 - 0.25	0.2 - 0.3
	Unalloyed structural steel	Up to 700	St52	1.0052	40 - 50	0.05 - 0.1	0.1 - 0.2	0.16 - 0.2	0.2 - 0.25	0.2 - 0.3
	Structural steel	700 - 950	Ck45	1.1191	30 - 50	0.05 - 0.1	0.1 - 0.2	0.16 - 0.2	0.2 - 0.25	0.2 - 0.3
	Cast steel	Up to 950	GS 40	1.0416	30 - 50	0.05 - 0.1	0.1 - 0.2	0.16 - 0.2	0.2 - 0.25	0.2 - 0.3
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	25 - 45	0.04 - 0.08	0.06 - 0.1	0.1 - 0.14	0.12 - 0.15	0.14 - 0.16
M	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	20 - 28	0.04 - 0.08	0.06 - 0.1	0.1 - 0.16	0.16 - 0.22	0.16 - 0.25
	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	12 - 18	0.06 - 0.08	0.08 - 0.12	0.12 - 0.16	0.14 - 0.16	0.15 - 0.18
K	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	10 - 12	0.03 - 0.06	0.06 - 0.1	0.1 - 0.12	0.12 - 0.13	0.12 - 0.15
	Grey cast iron	Up to 260 HB	GG 25	0.6025	50 - 60	0.1 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35
N	Ductile iron	Up to 280 HB	GGG 60	0.7060	40 - 60	0.1 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	40 - 60	0.1 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80 - 90	0.1 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 90	0.1 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	60 - 65	0.08 - 0.1	0.1 - 0.15	0.15 - 0.2	0.18 - 0.2	0.2 - 0.23
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	60 - 65	0.08 - 0.1	0.1 - 0.15	0.15 - 0.2	0.18 - 0.2	0.2 - 0.23
	Thermoset		Melamine		25 - 30	0.08 - 0.1	0.1 - 0.15	0.15 - 0.2	0.18 - 0.2	0.2 - 0.23

### Over 200,000 tools available online!

#### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com


**EX-SUS-GDS/GDR Twist drill bit**


- Please adjust these guideline values according to clamping operation and machine set-up!
  - Cutting data for application with coolant and for drilling depths up to 3 x D
- Cutting speed correction factor:  
 Drilling depth 4 x D = 0.9  
                           5 x D = 0.8  
                           6 x D = 0.8

114045....

114050....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm						
						1	2	3	4	5	6	8
P	Machining steel	Up to 700	9 SMn 28	1.0715	32 - 40	0.02 - 0.05	0.06 - 0.09	0.1 - 0.13	0.11 - 0.15	0.12 - 0.18	0.13 - 0.19	0.17 - 0.24
	Unalloyed structural steel	Up to 700	St-52	1.0052	32 - 40	0.02 - 0.05	0.06 - 0.09	0.1 - 0.13	0.11 - 0.15	0.12 - 0.18	0.13 - 0.19	0.17 - 0.24
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	15-20	0.02 - 0.04	0.05 - 0.07	0.06 - 0.09	0.08 - 0.12	0.1 - 0.15	0.15 - 0.18	0.2 - 0.24
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	15-20	0.02 - 0.04	0.05 - 0.07	0.06 - 0.09	0.08 - 0.12	0.1 - 0.15	0.15 - 0.18	0.2 - 0.24
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	63 - 100	0.02 - 0.06	0.04 - 0.12	0.06 - 0.18	0.08 - 0.24	0.1 - 0.3	0.12 - 0.36	0.16 - 0.45
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	63 - 100	0.02 - 0.06	0.04 - 0.12	0.06 - 0.18	0.08 - 0.24	0.1 - 0.3	0.12 - 0.36	0.16 - 0.45
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	25 - 50	0.01 - 0.03	0.04 - 0.06	0.06 - 0.09	0.08 - 0.11	0.1 - 0.13	0.12 - 0.15	0.16 - 0.2
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	25 - 50	0.01 - 0.03	0.04 - 0.06	0.06 - 0.09	0.08 - 0.11	0.1 - 0.13	0.12 - 0.15	0.16 - 0.2

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm					
						10	12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	32 - 40	0.2 - 0.28	0.24 - 0.34	0.27 - 0.39	0.29 - 0.43	0.32 - 0.49	0.34 - 0.52
	Unalloyed structural steel	Up to 700	St-52	1.0052	32 - 40	0.2 - 0.28	0.24 - 0.34	0.27 - 0.39	0.29 - 0.43	0.32 - 0.49	0.34 - 0.52
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	15-20	0.25 - 0.3	0.3 - 0.36	0.35 - 0.45	0.37 - 0.5	0.39 - 0.54	0.4 - 0.56
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	15-20	0.25 - 0.3	0.3 - 0.36	0.35 - 0.45	0.37 - 0.5	0.39 - 0.54	0.4 - 0.56
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	63 - 100	0.2 - 0.55	0.24 - 0.66	0.27 - 0.74	0.3 - 0.83	0.32 - 0.94	0.36 - 1
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	63 - 100	0.2 - 0.55	0.24 - 0.66	0.27 - 0.74	0.3 - 0.83	0.32 - 0.94	0.36 - 1
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	25 - 50	0.2 - 0.25	0.24 - 0.3	0.26 - 0.34	0.27 - 0.37	0.29 - 0.41	0.3 - 0.44
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	25 - 50	0.2 - 0.25	0.24 - 0.3	0.26 - 0.34	0.27 - 0.37	0.29 - 0.41	0.3 - 0.44


**NEXUS-GDS/GDR Twist drill bit**


- Please adjust these guideline values according to clamping operation and machine set-up!
  - Cutting data for application with coolant and for drilling depths up to 3 x D
- Cutting speed correction factors:  
 Drilling depth 4 x D = 0.9  
                           5 x D = 0.8  
                           6 x D = 0.8

114051....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm											
						Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø8	Ø10	Ø12			
P	Machining steel	Up to 700	9 SMn 28	1.0715	40 - 45	0.02 - 0.05	0.06 - 0.09	0.1 - 0.13	0.11 - 0.15	0.12 - 0.18	0.13 - 0.19	0.17 - 0.24	0.2 - 0.28	0.24 - 0.34			
	Unalloyed structural steel	Up to 700	St-52	1.0052	40 - 60	0.02 - 0.05	0.06 - 0.09	0.1 - 0.13	0.11 - 0.15	0.12 - 0.18	0.13 - 0.19	0.17 - 0.24	0.2 - 0.28	0.24 - 0.34			
	Structural steel	700 - 950	Ck45	1.1191	40 - 60	0.02 - 0.05	0.06 - 0.09	0.1 - 0.13	0.11 - 0.15	0.12 - 0.18	0.13 - 0.19	0.17 - 0.24	0.2 - 0.28	0.24 - 0.34			
	Tempering steel	500 - 950	42 CrMo4	1.7225	20 - 40	0.02 - 0.05	0.06 - 0.09	0.1 - 0.13	0.11 - 0.15	0.12 - 0.18	0.13 - 0.19	0.17 - 0.24	0.2 - 0.28	0.24 - 0.34			
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	15 - 30	0.01 - 0.02	0.02 - 0.04	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.12	0.08 - 0.16	0.1 - 0.2	0.12 - 0.24			
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	15 - 25	0.02 - 0.04	0.05 - 0.07	0.06 - 0.09	0.08 - 0.12	0.1 - 0.15	0.12 - 0.18	0.16 - 0.24	0.2 - 0.28	0.24 - 0.34			
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	30 - 60	0.02 - 0.06	0.04 - 0.12	0.06 - 0.18	0.08 - 0.24	0.1 - 0.3	0.12 - 0.36	0.16 - 0.45	0.2 - 0.55	0.24 - 0.66			
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	60 - 100	0.02 - 0.06	0.04 - 0.12	0.06 - 0.18	0.08 - 0.24	0.1 - 0.3	0.12 - 0.36	0.16 - 0.45	0.2 - 0.55	0.24 - 0.66			
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	40 - 60	0.01 - 0.03	0.04 - 0.06	0.06 - 0.09	0.08 - 0.11	0.1 - 0.13	0.12 - 0.15	0.16 - 0.2	0.2 - 0.25	0.24 - 0.3			
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	40 - 60	0.01 - 0.03	0.04 - 0.06	0.06 - 0.09	0.08 - 0.11	0.1 - 0.13	0.12 - 0.15	0.16 - 0.2	0.2 - 0.25	0.24 - 0.3			
N	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	40 - 60	0.01 - 0.03	0.04 - 0.06	0.06 - 0.09	0.08 - 0.11	0.1 - 0.13	0.12 - 0.15	0.16 - 0.2	0.2 - 0.25	0.24 - 0.3			
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	40 - 60	0.01 - 0.03	0.04 - 0.06	0.06 - 0.09	0.08 - 0.11	0.1 - 0.13	0.12 - 0.15	0.16 - 0.2	0.2 - 0.25	0.24 - 0.3			

## ATORN® Twist drill bit

- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	32	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.3 - 0.4
	Unalloyed structural steel	Up to 700	St-52	1.0052	25	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.3 - 0.4
	Structural steel	700 - 950	Ck45	1.1191	25	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	25	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.3 - 0.4
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	16	0.06 - 0.08	0.08 - 0.12	0.12 - 0.16	0.16 - 0.2	0.2 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	32	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	25	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	20	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	20	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4

## ATORN® Twist drill bit

- Please adjust these guideline values according to clamping operation and machine set-up!



101006....  
101013....  
101036....  
101063....  
101700....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Structural steel	700 - 950	Ck45	1.1191	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	16	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	10	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	12	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	14	0.06 - 0.08	0.8 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	36	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	28	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	30	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	22	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	55	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	45	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	28	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Thermoset		Melamine		18	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25

## ATORN® Twist drill bit

- Please adjust these guideline values according to clamping operation and machine set-up!



101008....  
101010....  
101038....  
101040....  
101605....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Structural steel	700 - 950	Ck45	1.1191	18	0.05 - 0.06	0.06 - 0.1	0.1 - 0.12	0.12 - 0.16	0.16 - 0.2
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	12	0.05 - 0.06	0.06 - 0.1	0.1 - 0.12	0.12 - 0.16	0.16 - 0.2
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	10	0.05 - 0.06	0.06 - 0.1	0.1 - 0.12	0.12 - 0.16	0.16 - 0.2
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	12	0.05 - 0.06	0.06 - 0.1	0.1 - 0.12	0.12 - 0.16	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	14	0.05 - 0.06	0.06 - 0.1	0.1 - 0.12	0.12 - 0.16	0.16 - 0.2
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	6	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.12	0.12 - 0.16
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	6	0.03 - 0.04	0.04 - 0.06	0.06 - 0.08	0.08 - 0.1	0.1 - 0.12

**ATORN® Mini twist drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

101075....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						0.05 - 0.2	0.25 - 0.45	0.5 - 0.7	0.75 - 0.95	1 - 1.5
P	Machining steel	Up to 700	9 SMn 28	1.0715	16	0.004 - 0.008	0.009 - 0.012	0.014 - 0.022	0.023 - 0.039	0.041 - 0.52
	Unalloyed structural steel	Up to 700	St-52	1.0052	21	0.005 - 0.01	0.011 - 0.016	0.019 - 0.028	0.029 - 0.045	0.050 - 0.06
	Structural steel	700 - 950	Ck45	1.1191	18	0.004 - 0.008	0.009 - 0.012	0.014 - 0.022	0.023 - 0.039	0.041 - 0.52
	Cast steel	Up to 950	GS 40	1.0416	18	0.004 - 0.008	0.009 - 0.012	0.014 - 0.022	0.023 - 0.039	0.041 - 0.52
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	14	0.003 - 0.006	0.007 - 0.01	0.011 - 0.018	0.019 - 0.033	0.035 - 0.046
M	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	14	0.002 - 0.004	0.005 - 0.007	0.008 - 0.014	0.015 - 0.028	0.029 - 0.04
	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	6	0.002 - 0.004	0.005 - 0.007	0.008 - 0.014	0.015 - 0.028	0.029 - 0.04
K	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	6	0.003 - 0.006	0.007 - 0.010	0.011 - 0.018	0.019 - 0.033	0.036 - 0.046
	Grey cast iron	Up to 260 HB	GG 25	0.6025	26	0.007 - 0.01	0.011 - 0.016	0.019 - 0.028	0.029 - 0.045	0.050 - 0.06
N	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	22	0.007 - 0.01	0.011 - 0.016	0.019 - 0.028	0.029 - 0.045	0.050 - 0.06
	Ductile iron	Up to 280 HB	GGG 60	0.7060	18	0.007 - 0.01	0.011 - 0.016	0.019 - 0.028	0.029 - 0.045	0.050 - 0.06
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	22	0.007 - 0.01	0.011 - 0.016	0.019 - 0.028	0.029 - 0.045	0.050 - 0.06
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	18	0.007 - 0.01	0.011 - 0.016	0.019 - 0.028	0.029 - 0.045	0.05 - 0.06
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	22	0.004 - 0.008	0.009 - 0.012	0.014 - 0.022	0.023 - 0.039	0.041 - 0.52
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	22	0.003 - 0.006	0.007 - 0.01	0.011 - 0.018	0.019 - 0.033	0.035 - 0.046
	Thermoplastic		PVC		18	0.003 - 0.006	0.007 - 0.01	0.011 - 0.018	0.019 - 0.033	0.035 - 0.046
	Thermoset		Melamine		16	0.003 - 0.006	0.007 - 0.01	0.011 - 0.018	0.019 - 0.033	0.035 - 0.046

**ATORN® Twist drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

101011....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	32	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Unalloyed structural steel	Up to 700	St-52	1.0052	25	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31
	Structural steel	700 - 950	Ck45	1.1191	25	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31
	Cast steel	Up to 950	GS 40	1.0416	25	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	32	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	28	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	20	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	20	0.1 - 0.12	0.12 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80	0.12 - 0.16	0.16 - 0.25	0.25 - 0.31	0.31 - 0.4	0.4 - 0.5
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80	0.12 - 0.16	0.16 - 0.25	0.25 - 0.31	0.31 - 0.4	0.4 - 0.5
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	63	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31
	Thermoset		Melamine		25	0.06 - 0.08	0.08 - 0.12	0.12 - 0.16	0.16 - 0.2	0.2 - 0.25

**ATORN® Twist drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

101012....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	47	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Structural steel	700 - 950	Ck45	1.1191	42	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	26	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	17	0.06 - 0.08	0.08 - 0.12	0.12 - 0.16	0.16 - 0.2	0.2 - 0.25
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	20	0.06 - 0.08	0.08 - 0.12	0.12 - 0.16	0.16 - 0.2	0.2 - 0.25
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	23	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	59	0.12 - 0.16	0.16 - 0.25	0.25 - 0.31	0.31 - 0.4	0.4 - 0.5
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	47	0.12 - 0.16	0.16 - 0.25	0.25 - 0.31	0.31 - 0.4	0.4 - 0.5
	Ductile iron	Up to 280 HB	GGG 60	0.7060	52	0.12 - 0.16	0.16 - 0.25	0.25 - 0.31	0.31 - 0.4	0.4 - 0.5
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	23	0.12 - 0.16	0.16 - 0.25	0.25 - 0.31	0.31 - 0.4	0.4 - 0.5
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	91	0.12 - 0.16	0.16 - 0.25	0.25 - 0.31	0.31 - 0.4	0.4 - 0.5
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	47	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	30	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31	0.31 - 0.4
	Thermoset		Melamine		28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.31

## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101014....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	36	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Structural steel	700 - 950	Ck45	1.1191	32	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	20	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	13	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	15	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	18	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
K	Grey cast iron	Up to 260 HB	G6 25	0.6025	45	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	36	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Ductile iron	Up to 280 HB	G6G 60	0.7060	40	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	28	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
N	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	70	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4

## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101016....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	10	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	12	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	6	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
H	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	8	0.03 - 0.04	0.04 - 0.63	0.63 - 0.08	0.08 - 0.1	0.1 - 0.13
	Hardened materials up to 55 HRC		X40Cr14	1.2083	3	0.03 - 0.04	0.04 - 0.06	0.06 - 0.08	0.08 - 0.1	0.1 - 0.13

## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101018....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	12	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	14	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	90	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4 - 0.5
	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	55	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	45	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	22	0.03 - 0.04	0.04 - 0.06	0.06 - 0.08	0.08 - 0.1	0.1 - 0.13

## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101017....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4 - 0.5
	Thermoplastic		PVC		25	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32

**ATORN® KSB-5 Twist drill bit**

- Please adjust these guideline values according to clamping operation and machine set-up!
- The specified values apply for insert up to 5 x D

101095....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	45 - 55	0.05 - 0.1	0.1 - 0.2	0.16 - 0.2	0.2 - 0.25	0.2 - 0.3
	Unalloyed structural steel	Up to 700	St-52	1.0052	35 - 45	0.05 - 0.1	0.1 - 0.2	0.16 - 0.2	0.2 - 0.25	0.2 - 0.3
	Structural steel	700 - 950	Ck45	1.1191	25 - 45	0.05 - 0.1	0.1 - 0.2	0.16 - 0.2	0.2 - 0.25	0.2 - 0.3
	Cast steel	Up to 950	GS 40	1.0416	25 - 45	0.05 - 0.1	0.1 - 0.2	0.16 - 0.2	0.2 - 0.25	0.2 - 0.3
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	23 - 40	0.04 - 0.08	0.06 - 0.1	0.1 - 0.14	0.12 - 0.15	0.14 - 0.16
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	18 - 25	0.04 - 0.08	0.06 - 0.1	0.1 - 0.14	0.12 - 0.15	0.14 - 0.16
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	10 - 16	0.06 - 0.08	0.08 - 0.12	0.12 - 0.16	0.14 - 0.16	0.15 - 0.18
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	10 - 12	0.03 - 0.06	0.06 - 0.1	0.1 - 0.12	0.12 - 0.13	0.12 - 0.15
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	40 - 50	0.1 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35
	Ductile iron	Up to 280 HB	GGG 60	0.7060	30 - 50	0.1 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	70 - 80	0 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35
	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	70 - 80	0 - 0.16	0.16 - 0.23	0.23 - 0.3	0.3 - 0.32	0.31 - 0.35

**ATORN® Twist drill bit**

- Please adjust these guideline values according to clamping operation and machine set-up!

101061....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Unalloyed structural steel	Up to 700	St-52	1.0052	36	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Structural steel	700 - 950	Ck45	1.1191	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Cast steel	Up to 950	GS 40	1.0416	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	14	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	8	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	36	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	28	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	28	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	22	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
N	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	55	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	28	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	22	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25

**ATORN® Twist drill bit**

- Please adjust these guideline values according to clamping operation and machine set-up!

101062....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	10	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	12	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
N	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	20	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	5	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	5	0.03 - 0.04	0.04 - 0.63	0.63 - 0.08	0.08 - 0.1	0.1 - 0.13



## ATORN® Deep-hole drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101070....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	22	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Unalloyed structural steel	Up to 700	St-52	1.0052	18	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Structural steel	700 - 950	Ck45	1.1191	22	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Cast steel	Up to 950	GS 40	1.0416	18	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	9	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	6	0.04 - 0.05	0.05 - 0.08	0.08 - 0.11	0.1 - 0.13	0.13 - 0.16
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	8	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	22	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	18	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Ductile iron	Up to 280 HB	GGG 60	0.7060	20	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	14	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	45	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	22	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	28	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Thermoplastic		PVC		18	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25

## ATORN® High-performance deep-hole drill bit TDXL



• Please adjust these guideline values according to clamping operation and machine set-up!

101099.... 101100....  
101101....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						1.6 - 2	3 - 4	5 - 6	8 - 10	12
P	Machining steel	Up to 700	9 SMn 28	1.0715	20 - 24	0.016 - 0.05	0.03 - 0.1	0.05 - 0.15	0.08 - 0.25	0.12 - 0.3
	Unalloyed structural steel	Up to 700	St-52	1.0052	20 - 24	0.016 - 0.05	0.03 - 0.1	0.05 - 0.15	0.08 - 0.25	0.12 - 0.3
	Structural steel	700 - 950	Ck45	1.1191	18 - 22	0.016 - 0.04	0.03 - 0.1	0.05 - 0.15	0.08 - 0.25	0.12 - 0.3
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	16 - 20	0.01 - 0.04	0.02 - 0.1	0.03 - 0.13	0.06 - 0.2	0.12 - 0.3
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	8 - 12	0.016 - 0.04	0.03 - 0.09	0.05 - 0.13	0.06 - 0.18	0.12 - 0.26
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	18 - 24	0.03 - 0.05	0.06 - 0.13	0.1 - 0.19	0.16 - 0.32	0.24 - 0.38
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	16 - 20	0.01 - 0.06	0.02 - 0.1	0.03 - 0.15	0.05 - 0.25	0.07 - 0.3

## ATORN® Twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

101507....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	16	0.02 - 0.2	0.2 - 0.25	0.25 - 0.3	0.2 - 0.32	0.32 - 0.38
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	14	0.02 - 0.2	0.2 - 0.25	0.25 - 0.3	0.3 - 0.32	0.32 - 0.38
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	10	0.12 - 0.16	0.16 - 0.2	0.2 - 0.24	0.24 - 0.26	0.26 - 0.3
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	36	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	70	0.3 - 0.4	0.4 - 0.5	0.5 - 0.6	0.6 - 0.65	0.65 - 0.7
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	55	0.2 - 0.25	0.28 - 0.32	0.32 - 0.38	0.38 - 0.4	0.4 - 0.45
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	45	0.2 - 0.25	0.28 - 0.32	0.32 - 0.38	0.38 - 0.4	0.4 - 0.45
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	36	0.02 - 0.2	0.2 - 0.25	0.25 - 0.3	0.3 - 0.32	0.32 - 0.38
	Thermoplastic		PVC		25	0.2 - 0.25	0.28 - 0.32	0.32 - 0.38	0.38 - 0.4	0.4 - 0.45
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	6	0.1 - 0.13	0.13 - 0.16	0.16 - 0.18	0.18 - 0.19	0.19 - 0.22

**ATORN® Twist drill bit (drilling bush)**

• Please adjust these guideline values according to clamping operation and machine set-up!

101601....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 8	8.1 - 16	16.1 - 25	25.1 - 40	40.1 - 50
P	Machining steel	Up to 700	9 SMn 28	1.0715	28	0.12 - 0.2	0.2 - 0.28	0.28 - 0.5	0.5 - 0.63	0.5 - 0.63
	Unalloyed structural steel	Up to 700	St-52	1.0052	22	0.1 - 0.16	0.16 - 0.3	0.3 - 0.4	0.4-0.5	0.5 - 0.63
	Structural steel	700 - 950	Ck45	1.1191	22	0.1 - 0.16	0.16 - 0.3	0.3 - 0.4	0.4-0.5	0.5 - 0.63
	Cast steel	Up to 950	GS 40	1.0416	22	0.1 - 0.16	0.16 - 0.3	0.3 - 0.4	0.4-0.5	0.5 - 0.63
K	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	12	0.05 - 0.13	0.13 - 0.19	0.19 - 0.32	0.32 - 0.4	0.4-0.5
	Grey cast iron	Up to 260 HB	GG 25	0.6025	28	0.12 - 0.2	0.2 - 0.28	0.28 - 0.5	0.5 - 0.63	0.63 - 0.8
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	22	0.12 - 0.2	0.2 - 0.28	0.28 - 0.5	0.5 - 0.63	0.63 - 0.8
	Ductile iron	Up to 280 HB	G66 60	0.7060	22	0.12 - 0.2	0.2 - 0.28	0.28 - 0.5	0.5 - 0.63	0.63 - 0.8
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	18	0.12 - 0.2	0.2 - 0.28	0.28 - 0.5	0.5 - 0.63	0.63 - 0.8
N	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	55	0.1 - 0.25	0.25 - 0.4	0.4 - 0.63	0.63 - 0.8	0.8 - 1
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	34	0.1 - 0.16	0.16 - 0.3	0.3 - 0.4	0.4-0.5	0.5 - 0.63
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	28	0.05 - 0.13	0.13 - 0.19	0.19 - 0.32	0.32 - 0.4	0.4-0.5
	Thermoplastic		PVC		22	0.1 - 0.16	0.16 - 0.3	0.3 - 0.4	0.4-0.5	0.5 - 0.63
	Thermoset		Melamine		14	0.05 - 0.13	0.13 - 0.19	0.19 - 0.32	0.32 - 0.4	0.4-0.5

**ATORN® Core drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

101510....

101515....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 14	14.1 - 20	20.1 - 40
P	Machining steel	Up to 700	9 SMn 28	1.0715	25 - 28	0.07	0.1	0.12	0.18	0.22
	Unalloyed structural steel	Up to 700	St-52	1.0052	26 - 30	0.07	0.1	0.12	0.18	0.22
	Structural steel	700 - 950	Ck45	1.1191	25 - 28	0.07	0.1	0.12	0.18	0.22
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	6 - 10	0.03	0.04	0.06	0.08	0.01
M	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	2-5	0.03	0.04	0.06	0.08	0.01
	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	3 - 6	0.03	0.04	0.06	0.08	0.01
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	4 - 10	0.03	0.04	0.06	0.08	0.01
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	10 - 18	0.07	0.1	0.12	0.18	0.22
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	9 - 13	0.05	0.08	0.1	0.15	0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	25 - 40	0.07	0.1	0.12	0.18	0.22
	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	10 - 30	0.07	0.1	0.12	0.18	0.22
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	10 - 30	0.07	0.1	0.12	0.18	0.22
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	10 - 30	0.07	0.1	0.12	0.18	0.22
	Thermoplastic		PVC		20 - 30	0.07	0.1	0.12	0.18	0.22
Thermoset		Melamine		15 - 25	0.05	0.08	0.1	0.15	0.18	

**ATORN® Pin hole drill bit**

Vc = 20-24 m/min.; V = 0.05 mm/rev

101025....



Drilling and turning ...

... with a single tool.

**ATORN®**  
Performance demands quality

## ATORN® Solid carbide micro drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

111550....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						0.1 - 1	1.1 - 1.5	1.6 - 2	2.1 - 3
P	Machining steel	Up to 700	9 SMn 28	1.0715	50 - 75	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Unalloyed structural steel	Up to 700	St-52	1.0052	50 - 75	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Structural steel	700 - 950	Ck45	1.1191	50 - 75	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Cast steel	Up to 950	GS 40	1.0416	50 - 70	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	45 - 60	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	20 - 25	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	20 - 35	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	20 - 35	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	60 - 100	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	60 - 80	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60 - 80	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	60 - 80	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	150 - 220	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	100 - 160	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	80 - 130	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	80 - 130	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Thermoplastic		PVC		20 - 60	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Thermoset		Melamine		20 - 55	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Graphite		C8000		60 - 95	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	10 - 30	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	10 - 30	0.035 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.075

## ATORN® Solid carbide twist drill bit

• Please adjust these guideline values according to clamping operation and machine set-up!



111005....



111010....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	80	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Unalloyed structural steel	Up to 700	St-52	1.0052	80	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Structural steel	700 - 950	Ck45	1.1191	70	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Cast steel	Up to 950	GS 40	1.0416	70	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	60	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	50	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	25	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	25	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	90	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	80	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Ductile iron	Up to 280 HB	GGG 60	0.7060	80	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	70	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	200	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.44	0.44 - 0.55
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150	0.1 - 0.13	0.13 - 0.22	0.22 - 0.25	0.25 - 0.32	0.32 - 0.44
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	70	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	120	0.08 - 0.11	0.1 - 0.16	0.16 - 0.22	0.22 - 0.25	0.25 - 0.32
	Thermoplastic		PVC		40	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
	Thermoset		Melamine		50	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.22	0.22 - 0.25
	Graphite		C8000		80	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	15	0.04 - 0.05	0.05 - 0.08	0.08 - 0.11	0.1 - 0.13	0.13 - 0.16
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15	0.04 - 0.05	0.05 - 0.08	0.08 - 0.11	0.1 - 0.13	0.13 - 0.16
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	20	0.05 - 0.06	0.06 - 0.11	0.1 - 0.13	0.13 - 0.16	0.16 - 0.22
	Hardened materials up to 64 HRC		100Cr6	1.2067	10	0.04 - 0.05	0.05 - 0.08	0.08 - 0.11	0.1 - 0.13	0.13 - 0.16

## ATORN® Solid carbide twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

111008....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	79	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Unalloyed structural steel	Up to 700	St-52	1.0052	92	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Structural steel	700 - 950	Ck45	1.1191	79	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Cast steel	Up to 950	GS 40	1.0416	79	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	58	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	27	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	27	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	98	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	92	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Ductile iron	Up to 280 HB	GGG 60	0.7060	92	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	83	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	240	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4 - 0.5
	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	136	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	205	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	136	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Thermoplastic		PVC		45	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Thermoset		Melamine		56	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Graphite		C8000		92	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	17	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	17	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
	H	Hardened materials up to 55 HRC	X40Cr14	1.2083	23	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2



## ATORN® Solid carbide twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

111009....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	91	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Unalloyed structural steel	Up to 700	St-52	1.0052	104	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Structural steel	700 - 950	Ck45	1.1191	91	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Cast steel	Up to 950	GS 40	1.0416	91	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	78	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	32	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	32	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	117	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	104	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Ductile iron	Up to 280 HB	GGG 60	0.7060	91	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	104	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	260	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4 - 0.5	0.5 - 0.63
	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	156	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4 - 0.5
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	234	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	156	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Thermoplastic		PVC		52	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Thermoset		Melamine		65	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Graphite		C8000		104	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	H	Hardened materials up to 55 HRC	X40Cr14	1.2083	26	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.22

**SARA® TiNplus HPC solid carbide high-performance drill bit**



• Please adjust these guideline values according to clamping operation and machine set-up!

111503....

111507....  
111512....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Cutting speed Vc m/min	Feed rates in mm/revolution in relation to drill bit diameter range in mm								
							With IC	3	4	5	6	8	10	12.50	16
P	Machining steel	Up to 700	9 SMn 28	1.0715	115	135	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
	Unalloyed structural steel	Up to 700	St-52	1.0052	90	95	0.09	0.13	0.16	0.2	0.25	0.25	0.32	0.4	0.5
	Structural steel	700 - 950	Ck45	1.1191	90	95	0.11	0.16	0.16	0.2	0.25	0.32	0.32	0.4	0.5
	Cast steel	Up to 950	GS 40	1.0416	60	68	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	70	68	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	45	50	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
M	Stainless steel, ferr./marten.	500 - 950	X 10 Cr 13	1.4006	36	36	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Stainless steel, austenitic	500 - 950	X 12 CrMoS 17	1.4104	45	52	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
K	Grey cast iron	100 - 400	GG 25	0.6025	125	125	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
	Alloyed grey cast iron	150-250	GGLNiCr 35 2	0.6678	36	40	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Ductile iron	400 - 800	GGG 60	0.7060	95	95	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
N	Malleable cast iron	350 - 700	GTS 55	0.8155	95	95	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	210	250	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	145	180	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
S	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	145	180	0.11	0.16	0.16	0.2	0.25	0.32	0.32	0.4	0.5
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	215	250	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
H	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	28	32	0.06	0.08	0.08	0.1	0.13	0.16	0.16	0.2	0.25
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20	28	0.06	0.08	0.08	0.1	0.13	0.16	0.16	0.2	0.25
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	32	45	0.05	0.06	0.06	0.08	0.1	0.13	0.13	0.16	0.2
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	20	28	0.04	0.05	0.05	0.06	0.08	0.1	0.1	0.13	0.16

**ATORN® AluSpeed 5D solid carbide high-performance drill bit**



111400....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed rates in mm/revolution in relation to drill bit diameter range in mm					
						2,5 - 3	3 - 5	5 - 8	8 - 12	12 - 16	16 - 20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	360	0,25	0,30	0,40	0,50	0,60	0,65
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	400	0,30	0,35	0,45	0,55	0,65	0,70
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200	0,15	0,23	0,30	0,38	0,45	0,52
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	160	0,15	0,23	0,30	0,38	0,45	0,52
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200	0,15	0,23	0,30	0,38	0,45	0,52
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	200	0,15	0,23	0,30	0,38	0,45	0,52

**Solid carbide high-performance drill bit HARD 3D / 5D**



• Please adjust these guideline values according to clamping operation and machine set-up!

111535....  
111536....

111537....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed rates in mm/revolution in relation to drill bit diameter range in mm					
						1 - 3	3 - 5	5 - 8	8 - 12	12 - 16	16 - 20
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	16 - 28	0,03 - 0,06	0,06 - 0,08	0,08 - 0,09	0,09 - 0,11	0,11 - 0,13	0,13 - 0,15
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	10 - 16	0,02 - 0,04	0,04 - 0,06	0,06 - 0,07	0,07 - 0,08	0,08 - 0,09	0,09 - 0,1
	Hardened materials up to 64 HRC		100Cr6	1.2067	8 - 14	0,02 - 0,04	0,04 - 0,06	0,06 - 0,07	0,07 - 0,08	0,08 - 0,09	0,09 - 0,1

**ATORN® Solid carbide drilling tools for fibrous materials**



111805....  
111810....

111815....

ISO	Materials group	Cutting speed Vc m/min	Feed rates in mm/revolution in relation to drill bit diameter range in mm				
			4	6	8	10	12
N	Fibre-reinforced plastics CFK	100 - 200	0,03	0,05	0,07	0,09	0,1
	Fibre-reinforced plastics GFK	100 - 150	0,03	0,05	0,07	0,09	0,1
	Fibre-reinforced plastics AFK	90 - 140	0,03	0,05	0,07	0,09	0,1

**ATORN® TiAlNplus HPC solid carbide high-performance drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

111566....  
111567....  
111562....

111563....  
111573....

**Solid carbide high-performance drill bit**

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm								
						3	4	5	6	8	10	12.50	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	145	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
	Unalloyed structural steel	Up to 700	St-52	1.0052	110	0.09	0.13	0.16	0.2	0.25	0.25	0.32	0.4	0.5
	Structural steel	700 - 950	Ck45	1.1191	110	0.11	0.16	0.16	0.2	0.25	0.32	0.32	0.4	0.5
	Cast steel	Up to 950	GS 40	1.0416	75	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	85	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	55	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	45	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	55	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	155	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	45	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	260	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	180	0.11	0.16	0.16	0.2	0.25	0.32	0.32	0.4	0.5
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	270	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	35	0.06	0.08	0.08	0.1	0.13	0.16	0.16	0.2	0.25
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	25	0.06	0.08	0.08	0.1	0.13	0.16	0.16	0.2	0.25
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	40	0.05	0.06	0.06	0.08	0.1	0.13	0.13	0.16	0.2
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	25	0.04	0.05	0.05	0.06	0.08	0.1	0.1	0.13	0.16

111564....  
111565....

111568....  
111569....

**Solid carbide high-performance drill bit with internal cooling**

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm								
						3	4	5	6	8	10	12.50	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
	Unalloyed structural steel	Up to 700	St-52	1.0052	120	0.09	0.13	0.16	0.2	0.25	0.25	0.32	0.4	0.5
	Structural steel	700 - 950	Ck45	1.1191	120	0.11	0.16	0.16	0.2	0.25	0.32	0.32	0.4	0.5
	Cast steel	Up to 950	GS 40	1.0416	85	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	85	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	65	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	45	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	160	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	50	0.07	0.1	0.1	0.13	0.16	0.2	0.2	0.25	0.32
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	310	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	220	0.16	0.2	0.25	0.32	0.32	0.4	0.5	0.63	0.63
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	220	0.11	0.16	0.16	0.2	0.25	0.32	0.32	0.4	0.5
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	325	0.14	0.2	0.2	0.25	0.32	0.4	0.4	0.5	0.63
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	40	0.06	0.08	0.08	0.1	0.13	0.16	0.16	0.2	0.25
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	35	0.06	0.08	0.08	0.1	0.13	0.16	0.16	0.2	0.25
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	55	0.05	0.06	0.06	0.08	0.1	0.13	0.13	0.16	0.2
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	35	0.04	0.05	0.05	0.06	0.08	0.1	0.1	0.13	0.16

**ATORN® Ultra-M solid carbide high-performance drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

111545....  
111547....

111549....  
111551....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm									
						3	4	5	6	8	10	12	16	18	20
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	80	0.080	0.1	0.1	0.125	0.16	0.2	0.2	0.25	0.28	0.315
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60	0.05	0.063	0.063	0.08	0.1	0.125	0.125	0.125	0.14	0.16
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	35	0.04	0.05	0.05	0.063	0.08	0.1	0.1	0.125	0.14	0.16
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0.04	0.05	0.05	0.063	0.08	0.1	0.1	0.125	0.14	0.16



## SARA® ALU solid carbide high-performance drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

111410....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples chemical	Material number	Cutting speed Vc m/min	Feed rates in mm/rev in relation to drill bit diameter range in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60	0.08	0.18	0.144	0.165	0.23
	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	260	0.14	0.182	0.264	0.357	0.45
N	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	240	0.14	0.182	0.264	0.357	0.45
	Copper alloy (brass) long-chipping	300 - 700	MS 63	2.0320	150	0.14	0.182	0.264	0.357	0.45
	Copper alloy (brass) short-chipping	Up to 500	MS 58	2.0402	150	0.14	0.182	0.264	0.357	0.45
	Thermoplastic		PVC		200	0.14	0.182	0.264	0.357	0.45
	Thermoset		Melamine		200	0.14	0.182	0.264	0.357	0.45
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50	0.06	0.088	0.116	0.132	0.16
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	35	0.06	0.088	0.116	0.132	0.16

## ATORN® Solid carbide twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

111011....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	80	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Unalloyed structural steel	Up to 700	St-52	1.0052	90	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Structural steel	700 - 950	Ck45	1.1191	80	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Cast steel	Up to 950	GS 40	1.0416	80	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	70	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	27	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	27	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	102	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	90	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Ductile iron	Up to 280 HB	GGG 60	0.7060	80	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	70	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	230	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4 - 0.5
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	135	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	205	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	135	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Thermoplastic		PVC		55	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
S	Thermoset		Melamine		45	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	17	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
H	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	17	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
	Hardened materials up to 55 HRC		X40Cr14	1.2083	22	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2

## ATORN® Solid carbide twist drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

111012....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	90	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Unalloyed structural steel	Up to 700	St-52	1.0052	100	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Structural steel	700 - 950	Ck45	1.1191	90	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Cast steel	Up to 950	GS 40	1.0416	90	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	30	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	30	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	115	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	100	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Ductile iron	Up to 280 HB	GGG 60	0.7060	90	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	80	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	260	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4 - 0.5	0.5 - 0.63
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	155	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4 - 0.5
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	235	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	155	0.1 - 0.16	0.16 - 0.2	0.22 - 0.25	0.25 - 0.32	0.32 - 0.4
	Thermoplastic		PVC		65	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
S	Thermoset		Melamine		50	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
H	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Hardened materials up to 55 HRC		X40Cr14	1.2083	25	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2

**ATORN® TiAlNplus HPC 8D solid carbide high-performance drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!



111570....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	145	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4-0.5
	Unalloyed structural steel	Up to 700	St-52	1.0052	145	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Structural steel	700 - 950	Ck45	1.1191	125	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Cast steel	Up to 950	GS 40	1.0416	120	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	120	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	65	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	45	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	210	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Ductile iron	Up to 280 HB	GGG 60	0.7060	160	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	130	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4-0.5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	310	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	220	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	220	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
S	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	125	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	40	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
H	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	35	0.05 - 0.06	0.06 - 0.1	0.1 - 0.13	0.13 - 0.16	0.16 - 0.2
	Hardened materials up to 55 HRC		X40Cr14	1.2083	55	0.04 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.13	0.13 - 0.16
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	35	0.03 - 0.04	0.04 - 0.63	0.63 - 0.1	0.08 - 0.1	0.1 - 0.13

**ATORN® TiAlNplus HPC 12D solid carbide high-performance drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!



111572....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	90	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4-0.5
	Unalloyed structural steel	Up to 700	St-52	1.0052	90	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Structural steel	700 - 950	Ck45	1.1191	80	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Cast steel	Up to 950	GS 40	1.0416	80	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	40	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	40	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	40	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	120	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Ductile iron	Up to 280 HB	GGG 60	0.7060	90	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	80	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.4-0.5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	150	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	120	0.02 - 0.2	0.2 - 0.32	0.32 - 0.4	0.4-0.5	0.5 - 0.63
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	120	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	40	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4

**ATORN® Solid carbide deep drill bits TiAlNplus HPC 16D/20D**

- Please adjust these guideline values according to clamping operation and machine set-up!
- **Pilot hole point angle 140°, 1-3 x D deep**

111574....

111575....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						3 - 5	5 - 8	8 - 10	10 - 12
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 120	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 120	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Structural steel	700 - 950	Ck45	1.1191	80 - 120	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Cast steel	Up to 950	GS 40	1.0416	80 - 100	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
	Case-hardened steel	Up to 950	16 MnCr 5	1.7131	80 - 110	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	60 - 100	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	50 - 70	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	40 - 70	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	70 - 110	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	70 - 110	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Ductile iron	Up to 280 HB	GGG 60	0.7060	70 - 110	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	70 - 110	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35

**ATORN® Solid carbide deep drill bits TiAlNplus HPC 25D/30D**

- Please adjust these guideline values according to clamping operation and machine set-up!
- **Pilot hole point angle 140°, 1-3 x D deep**

111576....

111577....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						3 - 5	5 - 8	8 - 10	10 - 12
P	Machining steel	Up to 700	9 SMn 28	1.0715	70 - 110	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Unalloyed structural steel	Up to 700	St-52	1.0052	70 - 110	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Structural steel	700 - 950	Ck45	1.1191	70 - 110	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Cast steel	Up to 950	GS 40	1.0416	70 - 90	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
	Case-hardened steel	Up to 950	16 MnCr 5	1.7131	60 - 100	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	50 - 90	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	40 - 60	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	30 - 60	0,06 - 0,1	0,1 - 0,18	0,16 - 0,24	0,2 - 0,32
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	70 - 100	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	70 - 100	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Ductile iron	Up to 280 HB	GGG 60	0.7060	70 - 100	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	70 - 100	0,06 - 0,12	0,1 - 0,2	0,16 - 0,28	0,2 - 0,35

**ATORN® Solid carbide flat drill bit**

- Please adjust these guideline values according to clamping operation and machine set-up!

111709....

111710....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter range in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	100	0.15	0.2	0.22	0.3	0.35
	Unalloyed structural steel	Up to 700	St-52	1.0052	90	0.15	0.2	0.22	0.3	0.35
	Structural steel	700 - 950	Ck45	1.1191	70	0.13	0.18	0.27	0.27	0.34
	Cast steel	Up to 950	GS 40	1.0416	80	0.15	0.2	0.22	0.30	0.34
	Case-hardened steel	Up to 950	16 MnCr 5	1.7131	70	0.13	0.18	0.27	0.27	0.34
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70	0.13	0.18	0.27	0.27	0.34
M	Stainless steel, ferr./marten.	500 - 950	X 5 CrNi 18 10	1.4301	40	0.07	0.1	0.11	0.15	0.18
	Stainless steel, austenitic	500 - 950	X 12 CrMoS 17	1.4104	25	0.06	0.08	0.1	0.14	0.16
K	Duplex	500 - 950	X 10 Cr 13	1.4006	25	0.06	0.08	0.1	0.14	0.16
	Grey cast iron	100 - 400	GG 25	0.6025	90	0.15	0.2	0.22	0.3	0.34
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	80	0.15	0.2	0.22	0.3	0.34
	Ductile iron	400 - 800	GGG 60	0.7060	80	0.15	0.2	0.22	0.3	0.34
N	Malleable cast iron	350 - 700	GTS 55	0.8155	80	0.15	0.2	0.22	0.3	0.34
	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	220	0.15	0.2	0.2	0.26	0.32
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	180	0.15	0.2	0.2	0.26	0.32
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	120	0.15	0.2	0.18	0.24	0.28
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	120	0.15	0.2	0.18	0.24	0.28
	Thermoplastic		PVC		100	0.07	0.1	0.12	0.14	0.2
	Thermoset		Melamine		-	0.07	0.1	0.12	0.14	0.2
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	35	0.06	0.08	0.09	0.13	0.15
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	35	0.06	0.08	0.09	0.13	0.15
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	25	0.05	0.07	0.08	0.11	0.13

**ADO solid carbide deep-hole drill bit**

- Please adjust these guideline values according to clamping operation and machine set-up!
- Pilot hole point angle 140°, 1-3 x D deep

111715....  
111716....  
111717....

111718....  
111726....

**10 x D - 30 x D**

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm						
						3	4	5	6	8	10	12
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 125	0,06 - 0,12	0,08 - 0,16	0,1 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,35	0,24 - 0,42
	Unalloyed structural steel	Up to 700	St-52	1.0052	60 - 125	0,06 - 0,12	0,08 - 0,16	0,1 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,35	0,24 - 0,42
	Structural steel	700 - 950	Ck45	1.1191	60 - 125	0,06 - 0,12	0,08 - 0,16	0,1 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,35	0,24 - 0,42
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 125	0,06 - 0,12	0,08 - 0,16	0,1 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,35	0,24 - 0,42
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 90	0,06 - 0,11	0,08 - 0,14	0,1 - 0,17	0,12 - 0,21	0,16 - 0,24	0,20 - 0,30	0,24 - 0,40
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 90	0,06 - 0,11	0,08 - 0,14	0,1 - 0,17	0,12 - 0,21	0,16 - 0,24	0,20 - 0,30	0,24 - 0,40
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	40 - 80	0,06 - 0,12	0,08 - 0,16	0,1 - 0,2	0,12 - 0,24	0,16 - 0,28	0,20 - 0,35	0,24 - 0,42
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	40 - 80	0,06 - 0,12	0,08 - 0,16	0,1 - 0,2	0,12 - 0,24	0,16 - 0,28	0,20 - 0,35	0,24 - 0,42
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	60 - 125	0,06 - 0,12	0,08 - 0,16	0,1 - 0,2	0,12 - 0,24	0,16 - 0,28	0,20 - 0,35	0,24 - 0,42
	Ductile iron	Up to 280 HB	GGG 60	0.7060	50 - 80	0,06 - 0,12	0,08 - 0,16	0,1 - 0,2	0,12 - 0,24	0,16 - 0,28	0,20 - 0,35	0,24 - 0,42

**40 x D, 50 x D**

111719....

111720....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm						
						3	4	5	6	8	10	12
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 120	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 120	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
	Structural steel	700 - 950	Ck45	1.1191	80 - 120	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
	Tempering steel	500 - 950	42 CrMo4	1.7225	80 - 120	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 90	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 90	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	40 - 70	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	40 - 70	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	60 - 100	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60 - 100	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,30	0,21 - 0,30

**ADO-MICRO solid carbide high-performance drill bit**

- Please adjust these guideline values according to clamping operation and machine set-up!

111721....  
111722....  
111723....

111724....  
111725....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						0,7	1	1,5	2
P	Machining steel	Up to 700	9 SMn 28	1.0715	20 - 60	0,007 - 0,021	0,01 - 0,03	0,015 - 0,045	0,02 - 0,06
	Unalloyed structural steel	Up to 700	St-52	1.0052	20 - 60	0,007 - 0,021	0,01 - 0,03	0,015 - 0,045	0,02 - 0,06
	Structural steel	700 - 950	Ck45	1.1191	20 - 60	0,007 - 0,021	0,01 - 0,03	0,015 - 0,045	0,02 - 0,06
	Tempering steel	500 - 950	42 CrMo4	1.7225	20 - 60	0,014 - 0,028	0,02 - 0,04	0,03 - 0,06	0,04 - 0,08
	Tempering steel	950 - 1300	43CrMo4	1.3563	20 - 40	0,014 - 0,028	0,02 - 0,04	0,03 - 0,06	0,04 - 0,08
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	20 - 40	0,014 - 0,028	0,02 - 0,04	0,03 - 0,06	0,04 - 0,08
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	20 - 70	0,007 - 0,021	0,01 - 0,03	0,015 - 0,045	0,02 - 0,06
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	20 - 70	0,007 - 0,021	0,01 - 0,03	0,015 - 0,045	0,02 - 0,06
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	20 - 60	0,014 - 0,028	0,02 - 0,04	0,03 - 0,06	0,04 - 0,08
	Ductile iron	Up to 280 HB	GGG 60	0.7060	30 - 50	0,014 - 0,028	0,02 - 0,04	0,03 - 0,06	0,04 - 0,08
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	20 - 60	0,007 - 0,021	0,01 - 0,03	0,015 - 0,045	0,02 - 0,06
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	30 - 70	0,014 - 0,028	0,02 - 0,04	0,03 - 0,06	0,04 - 0,08
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	40 - 60	0,011 - 0,018	0,015 - 0,025	0,023 - 0,038	0,03 - 0,05
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	5 - 15	0,004 - 0,014	0,005 - 0,02	0,008 - 0,03	0,01 - 0,04

**ATORN® Solid carbide countersink**

• Please adjust these guideline values according to clamping operation and machine set-up!

111013....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	85	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	80	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	80	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	70	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	160	0.13 - 0.16	0.16 - 0.25	0.25 - 0.32	0.32 - 0.4	0.40-5
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	120	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4

**ATORN® Solid carbide countersink**

• Please adjust these guideline values according to clamping operation and machine set-up!

111014....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Cast steel	Up to 950	GS 40	1.0416	95	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	100	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	40	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	80	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	100	0.06 - 0.08	0.08 - 0.13	0.13 - 0.16	0.16 - 0.2	0.2 - 0.25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	70	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4
	Thermoplastic		PVC		120	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25	0.25 - 0.32	0.32 - 0.4

**ATORN® HIGH FEED 5D solid carbide high-performance drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

111585....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm					
						1 - 3	3 - 5	5 - 8	8 - 12	12 - 16	16 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	110 - 150	0,08 - 0,19	0,19 - 0,26	0,26 - 0,38	0,38 - 0,45	0,45 - 0,52	0,52 - 0,58
	Unalloyed structural steel	Up to 700	St-52	1.0052	120 - 160	0,08 - 0,19	0,19 - 0,26	0,26 - 0,38	0,38 - 0,45	0,45 - 0,52	0,52 - 0,58
	Structural steel	700 - 950	Ck45	1.1191	110 - 150	0,08 - 0,19	0,19 - 0,26	0,26 - 0,38	0,38 - 0,45	0,45 - 0,52	0,52 - 0,58
	Tempering steel	500 - 950	42 CrMo4	1.7225	100 - 130	0,09 - 0,22	0,22 - 0,3	0,30 - 0,44	0,44 - 0,52	0,52 - 0,60	0,60 - 0,65
	Cast steel	Up to 950	GS 40	1.0416	90 - 125	0,08 - 0,19	0,19 - 0,26	0,26 - 0,38	0,38 - 0,45	0,45 - 0,52	0,52 - 0,6
	Alloyed case-hardened steel	Up to 1200	16 MnCr 5	1.7131	90 - 130	0,08 - 0,19	0,19 - 0,26	0,26 - 0,38	0,38 - 0,45	0,45 - 0,52	0,52 - 0,6
	Tempering steel	950 - 1300	43CrMo4	1.3563	50 - 100	0,09 - 0,22	0,22 - 0,3	0,30 - 0,44	0,44 - 0,52	0,52 - 0,60	0,60 - 0,65
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	100 - 130	0,09 - 0,22	0,22 - 0,3	0,30 - 0,44	0,44 - 0,52	0,52 - 0,60	0,60 - 0,65
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	40 - 80	0,06 - 0,15	0,15 - 0,2	0,2 - 0,35	0,35 - 0,4	0,4 - 0,46	0,46 - 0,51
	K	Grey cast iron	Up to 260 HB	GG 25	0.6025	85 - 130	0,2 - 0,32	0,32 - 0,38	0,38 - 0,55	0,55 - 0,65	0,65 - 0,7
Ductile iron		Up to 280 HB	GGG 60	0.7060	60 - 80	0,05 - 0,12	0,12 - 0,16	0,16 - 0,27	0,27 - 0,35	0,35 - 0,45	0,45 - 0,5
Malleable cast iron		Up to 280 HB	GTS 55	0.8155	75 - 115	0,15 - 0,29	0,29 - 0,35	0,35 - 0,5	0,5 - 0,6	0,6 - 0,65	0,65 - 0,7


**ATORN® Solid carbide drill reamer**

• Please adjust these guideline values according to clamping operation and machine set-up!

111701....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	65	0.15	0.18	0.24	0.37	0.4
	Unalloyed structural steel	Up to 700	St-52	1.0052	70	0.15	0.18	0.24	0.37	0.4
	Structural steel	700 - 950	Ck45	1.1191	55	0.15	0.18	0.24	0.37	0.4
	Cast steel	Up to 950	GS 40	1.0416	50	0.15	0.18	0.24	0.37	0.4
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	55	0.15	0.18	0.24	0.37	0.4
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	55	0.15	0.18	0.24	0.37	0.4
K	Grey cast iron	100 - 400	GG 25	0.6025	60	0.15	0.18	0.24	0.37	0.4
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	50	0.15	0.18	0.24	0.37	0.4
	Ductile iron	400 - 800	GGG 60	0.7060	50	0.15	0.18	0.24	0.37	0.4
	Malleable cast iron	350 - 700	GTS 55	0.8155	50	0.15	0.18	0.24	0.37	0.4




**HYP-HPO-3D / 5D solid carbide high-performance drill bit**


• Please adjust these guideline values according to clamping operation and machine set-up!

111628....

111629....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm					
						3	4	5	6	8	10
P	Machining steel	Up to 700	9 SMn 28	1.0715	100 - 150	0,09 - 0,12	0,10 - 0,15	0,12 - 0,18	0,14 - 0,20	0,16 - 0,24	0,18 - 0,27
	Unalloyed structural steel	Up to 700	St-52	1.0052	100 - 150	0,09 - 0,12	0,10 - 0,15	0,12 - 0,18	0,14 - 0,20	0,16 - 0,24	0,18 - 0,27
	Structural steel	700 - 950	Ck45	1.1191	80 - 120	0,09 - 0,12	0,10 - 0,15	0,12 - 0,18	0,14 - 0,20	0,16 - 0,24	0,18 - 0,27
	Tempering steel	500 - 950	42 CrMo4	1.7225	70 - 110	0,09 - 0,12	0,10 - 0,15	0,12 - 0,18	0,14 - 0,20	0,16 - 0,24	0,18 - 0,27
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	50 - 60	0,07 - 0,11	0,08 - 0,13	0,10 - 0,15	0,12 - 0,18	0,14 - 0,22	0,15 - 0,25
	Tempering steel	950 - 1300	43CrMo4	1.3563	50 - 60	0,07 - 0,11	0,08 - 0,13	0,10 - 0,15	0,12 - 0,18	0,14 - 0,22	0,15 - 0,25
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	50 - 60	0,07 - 0,11	0,08 - 0,13	0,10 - 0,15	0,12 - 0,18	0,14 - 0,22	0,15 - 0,25
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	50 - 60	0,07 - 0,11	0,08 - 0,13	0,10 - 0,15	0,12 - 0,18	0,14 - 0,22	0,15 - 0,25
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	40 - 50	0,09 - 0,12	0,10 - 0,15	0,12 - 0,18	0,14 - 0,20	0,16 - 0,24	0,18 - 0,27
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	40 - 50	0,09 - 0,12	0,10 - 0,15	0,12 - 0,18	0,14 - 0,20	0,16 - 0,24	0,18 - 0,27
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 200	0,12 - 0,15	0,13 - 0,18	0,15 - 0,22	0,18 - 0,25	0,20 - 0,30	0,23 - 0,33
	Ductile iron	Up to 280 HB	GGL-NiCr 35 2	0.6678	100 - 150	0,12 - 0,15	0,13 - 0,18	0,15 - 0,22	0,18 - 0,25	0,20 - 0,30	0,23 - 0,33
	Malleable cast iron	Up to 280 HB	GGG 60	0.7060	100 - 150	0,12 - 0,15	0,13 - 0,18	0,15 - 0,22	0,18 - 0,25	0,20 - 0,30	0,23 - 0,33
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	60 - 110	0,09 - 0,20	0,10 - 0,24	0,12 - 0,28	0,14 - 0,34	0,16 - 0,38	0,18 - 0,45
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	120 - 220	0,09 - 0,28	0,10 - 0,38	0,12 - 0,40	0,14 - 0,48	0,16 - 0,53	0,18 - 0,63
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	50 - 90	0,02 - 0,03	0,02 - 0,04	0,03 - 0,05	0,03 - 0,06	0,04 - 0,08	0,05 - 0,10
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	50 - 90	0,02 - 0,03	0,02 - 0,04	0,03 - 0,05	0,03 - 0,06	0,04 - 0,08	0,05 - 0,10
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	50 - 90	0,02 - 0,03	0,02 - 0,04	0,03 - 0,05	0,03 - 0,06	0,04 - 0,08	0,05 - 0,10
S	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	50 - 90	0,02 - 0,03	0,02 - 0,04	0,03 - 0,05	0,03 - 0,06	0,04 - 0,08	0,05 - 0,10
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	15 - 25	0,05 - 0,09	0,06 - 0,10	0,08 - 0,12	0,09 - 0,15	0,12 - 0,20	0,13 - 0,23
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 25	0,05 - 0,09	0,06 - 0,10	0,08 - 0,12	0,09 - 0,15	0,12 - 0,20	0,13 - 0,23
H	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	15 - 25	0,05 - 0,09	0,06 - 0,10	0,08 - 0,12	0,09 - 0,15	0,12 - 0,20	0,13 - 0,23
	Hardened materials up to 55 HRC		X40Cr14	1.2083	15 - 25	0,03 - 0,05	0,04 - 0,06	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	0,07 - 0,10
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	15 - 20	0,03 - 0,05	0,04 - 0,06	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	0,07 - 0,10

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	100 - 150	0,20 - 0,30	0,22 - 0,35	0,25 - 0,36	0,28 - 0,38	0,30 - 0,40
	Unalloyed structural steel	Up to 700	St-52	1.0052	100 - 150	0,20 - 0,30	0,22 - 0,35	0,25 - 0,36	0,28 - 0,38	0,30 - 0,40
	Structural steel	700 - 950	Ck45	1.1191	80 - 120	0,20 - 0,30	0,22 - 0,35	0,25 - 0,36	0,28 - 0,38	0,30 - 0,40
	Tempering steel	500 - 950	42 CrMo4	1.7225	70 - 110	0,20 - 0,30	0,22 - 0,35	0,25 - 0,36	0,28 - 0,38	0,30 - 0,40
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	50 - 60	0,17 - 0,26	0,18 - 0,30	0,20 - 0,32	0,23 - 0,33	0,25 - 0,35
	Tempering steel	950 - 1300	43CrMo4	1.3563	50 - 60	0,17 - 0,26	0,18 - 0,30	0,20 - 0,32	0,23 - 0,33	0,25 - 0,35
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	50 - 60	0,17 - 0,26	0,18 - 0,30	0,20 - 0,32	0,23 - 0,33	0,25 - 0,35
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	50 - 60	0,17 - 0,26	0,18 - 0,30	0,20 - 0,32	0,23 - 0,33	0,25 - 0,35
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	40 - 50	0,20 - 0,30	0,22 - 0,35	0,25 - 0,36	0,28 - 0,38	0,30 - 0,40
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	40 - 50	0,20 - 0,30	0,22 - 0,35	0,25 - 0,36	0,28 - 0,38	0,30 - 0,40
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 200	0,25 - 0,38	0,30 - 0,43	0,35 - 0,50	0,38 - 0,55	0,40 - 0,63
	Ductile iron	Up to 280 HB	GGL-NiCr 35 2	0.6678	100 - 150	0,25 - 0,38	0,30 - 0,43	0,35 - 0,50	0,38 - 0,55	0,40 - 0,63
	Malleable cast iron	Up to 280 HB	GGG 60	0.7060	100 - 150	0,25 - 0,38	0,30 - 0,43	0,35 - 0,50	0,38 - 0,55	0,40 - 0,63
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	60 - 110	0,20 - 0,53	0,22 - 0,57	0,25 - 0,61	0,28 - 0,63	0,28 - 0,68
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	120 - 220	0,20 - 0,75	0,22 - 0,81	0,25 - 0,85	0,28 - 0,90	0,30 - 0,98
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	50 - 90	0,06 - 0,12	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20	0,20 - 0,28
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	50 - 90	0,06 - 0,12	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20	0,20 - 0,28
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	50 - 90	0,06 - 0,12	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20	0,20 - 0,28
S	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	50 - 90	0,06 - 0,12	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20	0,20 - 0,28
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	15 - 25	0,14 - 0,24	0,15 - 0,26	0,16 - 0,26	0,18 - 0,28	0,20 - 0,30
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 25	0,14 - 0,24	0,15 - 0,26	0,16 - 0,26	0,18 - 0,28	0,20 - 0,30
H	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	15 - 25	0,14 - 0,24	0,15 - 0,26	0,16 - 0,26	0,18 - 0,28	0,20 - 0,30
	Hardened materials up to 55 HRC		X40Cr14	1.2083	15 - 25	0,09 - 0,12	0,10 - 0,13	0,10 - 0,13	0,12 - 0,16	0,14 - 0,18
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	15 - 20	0,09 - 0,12	0,10 - 0,13	0,10 - 0,13	0,12 - 0,16	0,14 - 0,18



Non-rebound ...

... it's the tool.

**ATORN**<sup>®</sup>  
Performance demands quality



**ADO-SUS-3D/5D solid carbide high-performance drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

111613.... 111615....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm							
						3	4	5	6	7	8	9	10
P	Machining steel	Up to 700	9 SMn 28	1.0715	80-120	0.06 - 0.12	0.08 - 0.16	0.1 - 0.2	0.12 - 0.24	0.14 - 0.26	0.16 - 0.28	0.18 - 0.3	0.2 - 0.3
	Unalloyed structural steel	Up to 700	St52	1.0052	80-120	0.06 - 0.12	0.08 - 0.16	0.1 - 0.2	0.12 - 0.24	0.14 - 0.26	0.16 - 0.28	0.18 - 0.3	0.2 - 0.3
	Structural steel	700 - 950	Ck45	1.1191	80-120	0.06 - 0.12	0.08 - 0.16	0.1 - 0.2	0.12 - 0.24	0.14 - 0.26	0.16 - 0.28	0.18 - 0.3	0.2 - 0.3
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 90	0.06 - 0.12	0.08 - 0.16	0.1 - 0.2	0.12 - 0.24	0.14 - 0.26	0.16 - 0.28	0.18 - 0.3	0.2 - 0.3
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	60 - 100	0.06 - 0.12	0.08 - 0.16	0.1 - 0.2	0.12 - 0.24	0.14 - 0.26	0.16 - 0.28	0.18 - 0.3	0.2 - 0.3
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60 - 100	0.06 - 0.12	0.08 - 0.16	0.1 - 0.2	0.12 - 0.24	0.14 - 0.26	0.16 - 0.28	0.18 - 0.3	0.2 - 0.3
S	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	30 - 60	0.06 - 0.09	0.08 - 0.12	0.1 - 0.15	0.12 - 0.18	0.14 - 0.21	0.16 - 0.24	0.18 - 0.27	0.2 - 0.3
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20-50	0.05 - 0.09	0.06 - 0.12	0.08 - 0.15	0.09 - 0.18	0.11 - 0.21	0.12 - 0.24	0.14 - 0.27	0.15 - 0.3
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20-50	0.05 - 0.09	0.06 - 0.12	0.08 - 0.15	0.09 - 0.18	0.11 - 0.21	0.12 - 0.24	0.14 - 0.27	0.15 - 0.3

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm						
						11	12	13	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	80-120	0.2 - 0.3	0.21 - 0.3	0.21 - 0.33	0.22 - 0.35	0.25 - 0.36	0.28 - 0.38	0.3 - 0.4
	Unalloyed structural steel	Up to 700	St52	1.0052	80-120	0.2 - 0.3	0.21 - 0.3	0.21 - 0.33	0.22 - 0.35	0.25 - 0.36	0.28 - 0.38	0.3 - 0.4
	Structural steel	700 - 950	Ck45	1.1191	80-120	0.2 - 0.3	0.21 - 0.3	0.21 - 0.33	0.22 - 0.35	0.25 - 0.36	0.28 - 0.38	0.3 - 0.4
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	60 - 100	0.2 - 0.3	0.21 - 0.3	0.21 - 0.33	0.22 - 0.35	0.25 - 0.36	0.28 - 0.38	0.3 - 0.4
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60 - 100	0.2 - 0.3	0.21 - 0.3	0.21 - 0.33	0.22 - 0.35	0.25 - 0.36	0.28 - 0.38	0.3 - 0.4
S	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	30 - 60	0.2 - 0.3	0.21 - 0.3	0.21 - 0.33	0.22 - 0.35	0.25 - 0.36	0.28 - 0.38	0.3 - 0.4
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20-50	0.15 - 0.3	0.16 - 0.3	0.18 - 0.33	0.19 - 0.35	0.22 - 0.36	0.24 - 0.38	0.27 - 0.4
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20-50	0.15 - 0.3	0.16 - 0.3	0.18 - 0.33	0.19 - 0.35	0.22 - 0.36	0.24 - 0.38	0.27 - 0.4

**ADF-2D solid carbide flat drill bit**

• Please adjust these guideline values according to clamping operation and machine set-up!

111711....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm					
						2	3	4	6	8	10
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 100	0.01 - 0.06	0.015 - 0.09	0.02 - 0.12	0.03 - 0.18	0.04 - 0.24	0.05 - 0.3
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 100	0.01 - 0.06	0.015 - 0.09	0.02 - 0.12	0.03 - 0.18	0.04 - 0.24	0.05 - 0.3
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	30 - 90	0.01 - 0.06	0.015 - 0.09	0.02 - 0.12	0.03 - 0.18	0.04 - 0.24	0.05 - 0.3
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	20 - 40	0.01 - 0.04	0.015 - 0.06	0.02 - 0.08	0.03 - 0.12	0.04 - 0.16	0.05 - 0.2
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	60 - 120	0.01 - 0.06	0.015 - 0.09	0.02 - 0.12	0.03 - 0.18	0.04 - 0.24	0.05 - 0.3
	Ductile iron	Up to 280 HB	GGG 60	0.7060	50 - 80	0.01 - 0.06	0.015 - 0.09	0.02 - 0.12	0.03 - 0.18	0.04 - 0.24	0.05 - 0.3
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80 - 200	0.01 - 0.06	0.015 - 0.09	0.02 - 0.12	0.03 - 0.18	0.04 - 0.24	0.05 - 0.3
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 200	0.01 - 0.06	0.015 - 0.09	0.02 - 0.12	0.03 - 0.18	0.04 - 0.24	0.05 - 0.3
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	20 - 30	0.01 - 0.03	0.015 - 0.045	0.02 - 0.06	0.03 - 0.09	0.04 - 0.12	0.05 - 0.15

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 100	0.06 - 0.3	0.07 - 0.35	0.08 - 0.36	0.09 - 0.38	0.1 - 0.4
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 100	0.06 - 0.3	0.07 - 0.35	0.08 - 0.36	0.09 - 0.38	0.1 - 0.4
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	30 - 90	0.06 - 0.3	0.07 - 0.35	0.08 - 0.36	0.09 - 0.38	0.1 - 0.4
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	20 - 40	0.06 - 0.24	0.07 - 0.28	0.08 - 0.32	0.09 - 0.36	0.1 - 0.4
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	60 - 120	0.06 - 0.3	0.07 - 0.35	0.08 - 0.36	0.09 - 0.38	0.1 - 0.4
	Ductile iron	Up to 280 HB	GGG 60	0.7060	50 - 80	0.06 - 0.3	0.07 - 0.35	0.08 - 0.36	0.09 - 0.38	0.1 - 0.4
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80 - 200	0.06 - 0.36	0.07 - 0.42	0.08 - 0.48	0.09 - 0.54	0.1 - 0.60
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 200	0.06 - 0.36	0.07 - 0.42	0.08 - 0.48	0.09 - 0.54	0.1 - 0.60
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	20 - 30	0.06 - 0.18	0.07 - 0.21	0.08 - 0.24	0.09 - 0.27	0.1 - 0.3

## ATORN® Solid carbide short step drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

102202....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16
P	Machining steel	Up to 700	9 SMn 28	1.0715	75	0.1	0.15	0.190	0.21
	Unalloyed structural steel	Up to 700	St-52	1.0052	75	0.1	0.15	0.190	0.21
	Structural steel	700 - 950	Ck45	1.1191	60	0.1	0.12	0.153	0.17
	Cast steel	Up to 950	GS 40	1.0416	60	0.18	0.24	0.37	0.34
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	60	0.1	0.12	0.153	0.17
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60	0.1	0.12	0.153	0.17
M	Stainless steel, ferr./marten.	500 - 950	X 10 Cr 13	1.4006	25	0.08	0.11	0.143	0.16
	Stainless steel, austenitic	500 - 950	X 12 CrMoS 17	1.4104	30	0.09	0.12	0.16	0.18
K	Grey cast iron	100 - 400	GG 25	0.6025	70	0.18	0.24	0.37	0.34
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	60	0.18	0.24	0.37	0.34
	Ductile iron	400 - 800	GGG 60	0.7060	60	0.18	0.24	0.37	0.34
	Malleable cast iron	350 - 700	GTS 55	0.8155	60	0.18	0.24	0.37	0.34
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	200	0.14	0.2	0.28	0.32
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	180	0.14	0.2	0.28	0.32
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	80	0.11	0.18	0.247	0.28
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	80	0.11	0.18	0.247	0.28
	Thermoplastic		PVC		40	0.08	0.14	0.18	0.2
	Thermoset		Melamine		40	0.08	0.14	0.18	0.2
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	35	0.06	0.1	0.133	0.15
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	35	0.06	0.1	0.133	0.15
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	25	0.1	0.12	0.153	0.17



102211....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm		
						3 - 5	5.1 - 8	8.1 - 12
P	Machining steel	Up to 700	9 SMn 28	1.0715	75	0.1	0.125	0.18
	Unalloyed structural steel	Up to 700	St-52	1.0052	75	0.1	0.125	0.18
	Structural steel	700 - 950	Ck45	1.1191	60	0.1	0.11	0.145
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	60	0.1	0.11	0.145
	Cast steel	Up to 950	GS 40	1.0416	60	0.18	0.21	0.29
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	60	0.1	0.11	0.145
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	25	0.08	0.095	0.135
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	25	0.08	0.095	0.135
K	Grey cast iron	100 - 400	GG 25	0.6025	70	0.18	0.21	0.29
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	60	0.18	0.21	0.29
	Ductile iron	400 - 800	GGG 60	0.7060	60	0.18	0.21	0.29
	Malleable cast iron	350 - 700	GTS 55	0.8155	60	0.18	0.21	0.29
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	200	0.14	0.17	0.26
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	180	0.14	0.17	0.26
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	80	0.110	0.145	0.23
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	80	0.110	0.145	0.23
	Thermoplastic	40 - 70	PVC		40	0.08	0.11	0.17
	Thermoset	20 - 40	Melamine		40	0.08	0.11	0.17
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	35	0.06	0.08	0.125

## HSS core drill bit



• Please adjust these guideline values according to manufacturer specifications, clamping operation and machine set-up.

100601....

100602....

### Cooling with air, drilling emulsion or cutting oil

	Unalloyed steel Up to 700 N/mm <sup>2</sup>	Alloyed steel, stainless steels Up to 1000 N/mm <sup>2</sup>	Aluminium alloy
Cutting speed Vc m/min	30	20	30


**Drilling system T-A Pro™**

- Please adjust these guideline values according to clamping operation and machine set-up!



105980....  
105982....  
105984....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						11,10 - 12,69	12,70 - 17,64	17,65 - 24,37	24,38 - 35,04	35,05 - 47,80
P	Machining steel	Up to 700	9 SMn 28	1.0715	125 - 145	0,15 - 0,18	0,24 - 0,26	0,32 - 0,34	0,40 - 0,42	0,50 - 0,52
	Unalloyed structural steel	Up to 700	St-52	1.0052	85 - 120	0,15 - 0,18	0,24 - 0,26	0,32 - 0,34	0,40 - 0,42	0,50 - 0,52
	Structural steel	700 - 950	CK45	1.1191	100 - 125	0,10 - 0,15	0,18 - 0,23	0,23 - 0,30	0,30 - 0,38	0,41 - 0,48
	Tempering steel	500 - 950	42 CrMo4	1.7225	90 - 105	0,10 - 0,15	0,18 - 0,23	0,23 - 0,30	0,30 - 0,38	0,41 - 0,48
	Tempering steel	950 - 1300	43CrMo4	1.3563	55 - 65	0,09 - 0,11	0,14 - 0,16	0,19 - 0,21	0,24 - 0,26	0,29 - 0,31
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	55 - 65	0,09 - 0,11	0,14 - 0,16	0,19 - 0,21	0,24 - 0,26	0,29 - 0,31
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	55 - 65	0,09 - 0,11	0,14 - 0,16	0,19 - 0,21	0,24 - 0,26	0,29 - 0,31
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	50 - 85	0,10 - 0,13	0,23 - 0,25	0,25 - 0,28	0,28 - 0,30	0,30 - 0,33
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	70 - 85	0,07 - 0,09	0,09 - 0,11	0,14 - 0,16	0,19 - 0,21	0,24 - 0,26
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	25 - 35	0,10 - 0,13	0,12 - 0,14	0,13 - 0,15	0,14 - 0,16	0,15 - 0,18
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120 - 185	0,10 - 0,18	0,15 - 0,30	0,18 - 0,41	0,23 - 0,51	0,30 - 0,61
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120 - 150	0,10 - 0,18	0,15 - 0,30	0,18 - 0,41	0,23 - 0,51	0,30 - 0,61
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120 - 150	0,10 - 0,18	0,15 - 0,30	0,18 - 0,41	0,23 - 0,51	0,30 - 0,61
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	185 - 335	0,13 - 0,23	0,18 - 0,33	0,25 - 0,43	0,33 - 0,51	0,41 - 0,61
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	185 - 335	0,19 - 0,21	0,32 - 0,34	0,40 - 0,42	0,46 - 0,51	0,55 - 0,56
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	50 - 60	0,04 - 0,06	0,07 - 0,09	0,14 - 0,16	0,19 - 0,21	0,24 - 0,26
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	50 - 60	0,04 - 0,06	0,07 - 0,09	0,14 - 0,16	0,19 - 0,21	0,24 - 0,26
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	100 - 135	0,17 - 0,19	0,29 - 0,31	0,40 - 0,42	0,50 - 0,52	0,60 - 0,61
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	100 - 135	0,17 - 0,19	0,29 - 0,31	0,40 - 0,42	0,50 - 0,52	0,60 - 0,61
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	15 - 20	0,07 - 0,09	0,15 - 0,18	0,18 - 0,20	0,20 - 0,25	0,25 - 0,30
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 20	0,07 - 0,09	0,15 - 0,18	0,18 - 0,20	0,20 - 0,25	0,25 - 0,30
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	20 - 30	0,10 - 0,13	0,18 - 0,20	0,20 - 0,23	0,20 - 0,25	0,30 - 0,36
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	15 - 30	0,05 - 0,08	0,13 - 0,15	0,18 - 0,20	0,20 - 0,23	0,25 - 0,30

**Multiplier for cutting speed and feed for various tool lengths (Factor 0,8)**

	Extra-short	3xD	5xD	7xD	10xD	12xD	15xD
Cutting speed	See table	See table	See table	0,8	0,8	0,7	0,7
Feed	See table	See table	See table	0,8	0,8	0,7	0,7

**Coolant recommendation**

Series	Extra-short, 3xD, 5xD		7xD, 10xD		12xD, 15xD	
	Coolant pressure (bar)	Flow rate (l/min)	Coolant pressure (bar)	Flow rate (l/min)	Coolant pressure (bar)	Flow rate (l/min)
Z	31	15	34	22	45	30
0	24	22	31	34	34	45
1	21	30	27	38	34	45
2	17	38	24	49	31	60
3	14	45	21	53	27	68

## Over 200,000 tools available online!

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com

**HSS cutting inserts, Series Y to 2**



- Please adjust these guideline values according to manufacturer specifications, clamping operation and machine set-up!
- As starting values, we recommend reducing the specified cutting data by 20%.
- **Note:** The recommended cutting speeds for AM200-coated cutting inserts are based on a rule of thumb of data and apply under optimum conditions. In many applications the optimum conditions are not present. Thus it is necessary to adapt the cutting speed to the respective circumstances. We are happy to provide technical support for your specific application.

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						9.5 - 12.95	12.98 - 17.53	17.53 - 24.38	24.41 - 35
P	Machining steel	Up to 700	9 SMn 28	1.0715	75	0.15	0.23	0.33	0.41
	Unalloyed structural steel	Up to 700	St-52	1.0052	56	0.15	0.25	0.33	0.38
	Structural steel	700 - 950	Ck45	1.1191	66	0.13	0.2	0.3	0.38
	Tempering steel	500 - 950	42 CrMo4	1.7225	56	0.13	0.2	0.3	0.38
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	59	0.15	0.23	0.33	0.41
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	23	0.1	0.18	0.23	0.28
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30	0.1	0.18	0.25	0.3
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	29	0.15	0.2	0.28	0.3
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	34	0.18	0.23	0.3	0.36
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	82	0.2	0.3	0.41	0.51
	Ductile iron	Up to 280 HB	GGG 60	0.7060	66	0.15	0.23	0.33	0.43
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	44	0.13	0.18	0.25	0.28
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	12	0.1	0.15	0.2	0.25
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	14	0.1	0.18	0.23	0.28

Formulae:

Rotational speed:

$$n = \frac{V_c \times 1000}{\pi \times D} \text{ (rpm)}$$

Cutting speed:

$$V_c = \frac{n \times \pi \times D}{1000} \text{ (m/min)}$$

Feed rate:

$$V_f = f \times n \text{ (mm/min)}$$

**Multiplier for cutting speed and feed for various tool lengths**

	Tool length							
	Extra-short	Short	Medium-length	Standard	Extra-long	Ultra-long	XL	3XL
Cutting speed	See table	See table	See table	See table	x 0.90	x 0.85	x 0.80	x 0.75
Feed	See table	See table	See table	See table	See table	x 0.95	x 0.90	x 0.90



... with indexable insert.

Multifunctional ...

**ATORN**<sup>®</sup>  
Performance demands quality


**Carbide cutting inserts, Series Y to 2**


- Please adjust these guideline values according to manufacturer specifications, clamping operation and machine set-up!
- As starting values, we recommend reducing the specified cutting data by 20%.

**105146....**  
**105241....**
**105341....**  
**105446....**  
**105546....**

- **Note:** The recommended cutting speeds for AM200-coated cutting inserts are based on a rule of thumb of data and apply under optimum conditions. In many applications the optimum conditions are not present. Thus it is necessary to adapt the cutting speed to the respective circumstances. We are happy to provide technical support for your specific application.

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						9.5 - 12.5	13 - 17.5	17.86 - 24	25 - 35
P	Machining steel	Up to 700	9 SMn 28	1.0715	108	0.15	0.23	0.33	0.41
	Unalloyed structural steel	Up to 700	St52	1.0052	87	0.15	0.25	0.33	0.38
	Structural steel	700 - 950	Ck45	1.1191	80	0.13	0.2	0.3	0.38
	Tempering steel	500 - 950	42 CrMo4	1.7225	87	0.13	0.2	0.3	0.38
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	95	0.15	0.23	0.33	0.41
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	56	0.1	0.18	0.23	0.28
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	59	0.1	0.18	0.25	0.3
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	56	0.15	0.2	0.28	0.3
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	73	0.18	0.23	0.3	0.36
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	152	0.2	0.3	0.38	0.48
	Ductile iron	Up to 280 HB	GGG 60	0.7060	131	0.15	0.23	0.3	0.38
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	102	0.13	0.18	0.25	0.28
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	29	0.1	0.15	0.2	0.25
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	37	0.1	0.18	0.23	0.28

Formulae:

Rotational speed:

$$n = \frac{V_c \times 1000}{\pi \times D} \text{ (rpm)}$$

Cutting speed:

$$V_c = \frac{n \times \pi \times D}{1000} \text{ (m/min)}$$

Feed rate:

$$V_f = f \times n \text{ (mm/min)}$$

**Multiplier for cutting speed and feed for various tool lengths**

	Tool length							
	Extra-short	Short	Medium-length	Standard	Extra-long	Ultra-long	XL	3XL
Cutting speed	See table	See table	See table	See table	-	-	-	-
Feed	See table	See table	See table	See table	-	-	-	-

# THE COMPLETE MACHINING RANGE



**PALBIT**  
**Machining tools**  
 411 pages  
 Art.no. 019900 0315

Overview of all free manufacturers' catalogues  
 on page 16/17


**HSS cutting inserts, Series 3 to 8**


- Please adjust these guideline values according to manufacturer specifications, clamping operation and machine set-up!
- As starting values, we recommend reducing the specified cutting data by 20%.
- **Note:** The recommended cutting speeds for AM200-coated cutting inserts are based on a rule of thumb of data and apply under optimum conditions. In many applications the optimum conditions are not present. Thus it is necessary to adapt the cutting speed to the respective circumstances. We are happy to provide technical support for your specific application.

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed V <sub>c</sub> m/min	Feed f in mm/rev in relation to drill bit diameter in mm		
						35 - 47.8	47.85 - 65	66 - 114.48
P	Machining steel	Up to 700	9 SMn 28	1.0715	79	0.46	0.53	0.61
	Unalloyed structural steel	Up to 700	St-52	1.0052	57	0.41	0.48	0.61
	Structural steel	700 - 950	Ck45	1.1191	68	0.41	0.48	0.56
	Tempering steel	500 - 950	42 CrMo4	1.7225	59	0.38	0.43	0.51
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	64	0.43	0.48	0.56
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	24	0.3	0.41	0.46
M	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	32	0.3	0.38	0.43
	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	32	0.3	0.36	0.46
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	36	0.36	0.41	0.51
K	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	22	0.3	0.36	0.46
	Grey cast iron	Up to 260 HB	GG 25	0.6025	84	0.61	0.69	0.76
	Ductile iron	Up to 280 HB	GGG 60	0.7060	68	0.46	0.53	0.61
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	47	0.28	0.36	0.41
	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	-	0.56	0.64	0.64
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	-	0.56	0.64	0.64
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	15	0.25	0.3	0.3
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	12	0.25	0.3	0.3
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	13	0.3	0.38	0.38
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	29	0.3	0.41	0.46
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	14	0.25	0.3	0.4

Formulae:

Rotational speed:

$$n = \frac{V_c \times 1000}{\pi \times D} \text{ (rpm)}$$

Cutting speed:

$$V_c = \frac{n \times \pi \times D}{1000} \text{ (m/min)}$$

Feed rate:

$$V_f = f \times n \text{ (mm/min)}$$

**Multiplier for cutting speed and feed for various tool lengths**

	Tool length							
	Extra-short	Short	Medium-length	Standard	Extra-long	Ultra-Long	XL	3XL
Cutting speed	See table	See table	See table	See table	x 0.90	x 0.85	x 0.80	x 0.75
Feed	See table	See table	See table	See table	See table	x 0.95	x 0.90	x 0.90

**SOLID CARBIDE MILLING CUTTERS**

# AT THEIR BEST



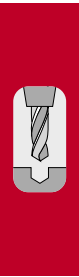

**VAN HOORN**  
End milling cutters  
189 pages  
Art.no. 019900 0079

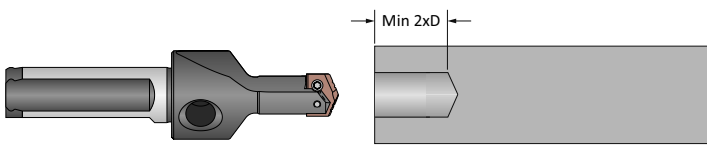
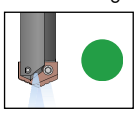
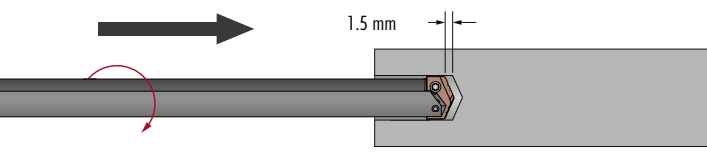
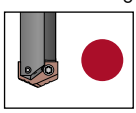
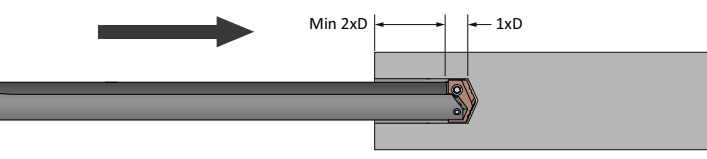
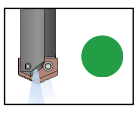
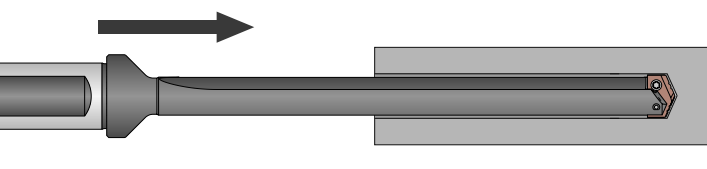
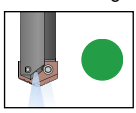
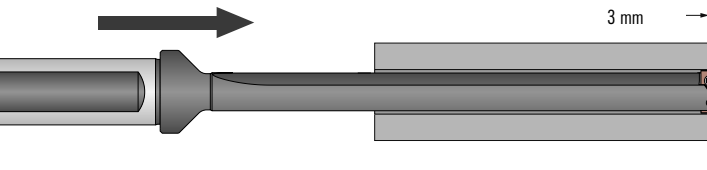
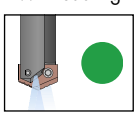
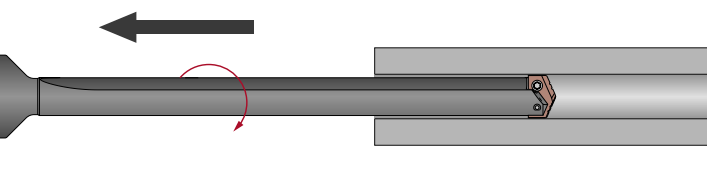
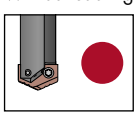
Overview of all free manufacturers' catalogues  
on page 16/17



**MEC Machining notes drilling system T-A®**

- Please adjust these guideline values according to clamping operation and machine set-up!
- **Note:** Tool breakage can cause serious damage. Without support bushings, please pre-drill a pilot bore 2-3xD deep with a short holder. The rotational speed of the tool outside the component may not exceed 50 rpm.



<p><b>1. Pilot bore</b> 100 % rpm 100 % mm/rev</p>	<p>Pre-drill a pilot bore of at least 2xD deep using the AMEC® pilot drill bit. Use a short AMEC® pilot drill bit with an equal or greater point angle.</p> 	<p>With cooling</p> 
<p><b>2. Insert the deep-hole drill bit into the pilot bore</b> 50 rpm max 300 mm/min</p>	<p>Position the AMEC® deep-hole drill bit up to 1.5 mm from the root of the pilot bore with max. 50 rpm (clockwise rotation) and with a feed of 300 mm/min.</p> 	<p>Without cooling</p> 
<p><b>3. Deep-hole drilling - Between-drilling</b> 50 % rpm 75 % mm/rev</p>	<p>Drill 1xD beyond the root of the pilot bore. Reduce cutting speed by 50 % and reduce feed by 25 %. At least 1 seconds' dwell time is required prior to further machining to reach full speed (prevents vibration).</p> 	<p>With cooling</p> 
<p><b>4. Deep-hole drilling bit - Blind hole</b> 100 % rpm 100 % mm/rev</p>	<p>Drill to the full depth using the recommended cutting data. <b>Clamping cycles not recommended.</b></p> 	<p>With cooling</p> 
<p><b>5. Deep-hole drilling bit - Through-hole</b> 50 % rpm 75 % mm/rev</p>	<p><b>Only for through-holes:</b> Reduce cutting speed by 50 % and reduce feed by 25 % before exit. Use no more than 3 mm beyond the full diameter.</p> 	<p>With cooling</p> 
<p><b>6. Retracting the drill bit</b> 50 rpm max</p>	<p>Reduction of the rotational speed to <b>max. 50 rpm</b> before the AMEC® drill bit is retracted from the hole.</p> 	<p>Without cooling</p> 

## CHT Indexable inserts-NC spotting drill bits



• Please adjust these guideline values according to clamping operation and machine set-up!

100800....  
100801....  
100802....

100810....  
100811....  
100815....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min		Feed fz mm/tooth
					PH7920	SOMT 11T308	
P	Unalloyed structural steel	Up to 700	St-52	1.0052	120 - 150		0,04 - 0,08
	Tempering steel	500 - 950	42 CrMo4	1.7225	100 - 120		0,03 - 0,07
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	60 - 100		0,03 - 0,06
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	100 - 150		0,04 - 0,07
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	80 - 120		0,03 - 0,06
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	50 - 90		0,03 - 0,06
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	90 - 150		0,05 - 0,1
	Ductile iron	Up to 280 HB	GGG 60	0.7060	80 - 120		0,05 - 0,08
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	70 - 110		0,04 - 0,08

## ATORN® ETD 840 Indexable insert drill bit



• Please adjust these guideline values according to clamping operation and machine set-up!

106003....  
106005....  
106007....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min 3 x D	Cutting speed Vc m/min 5 x D	Cutting speed Vc m/min 7 x D	Feed f in mm/rev in relation to drill bit diameter in mm			
								8 - 12	12 - 20	20 - 31.5	31.5 - 40
								P	Machining steel	Up to 700	9 SMn 28
Unalloyed structural steel	Up to 700	St-52	1.0052	100 - 110	100 - 105	85 - 100	0.2 - 0.25		0.25 - 0.4	0.4 - 0.5	0.5 - 0.63
Structural steel	700 - 950	Ck45	1.1191	85 - 110	85 - 105	85 - 100	0.16 - 0.2		0.2 - 0.315	0.315 - 0.4	0.4 - 0.5
Tempering steel	500 - 950	42 CrMo4	1.7225	85 - 110	85 - 105	85 - 100	0.16 - 0.2		0.2 - 0.315	0.315 - 0.4	0.4 - 0.5
Cast steel	Up to 950	GS 40	1.0416	85 - 100	85 - 105	85 - 100	0.16 - 0.2		0.2 - 0.315	0.315 - 0.4	0.4 - 0.5
Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	85 - 110	85 - 105	85 - 100	0.16 - 0.2		0.2 - 0.315	0.315 - 0.4	0.4 - 0.5
Tempering steel	950 - 1300	43CrMo4	1.3563	70 - 80	50 - 55	35 - 45	0.16 - 0.2		0.2 - 0.315	0.315 - 0.4	0.4 - 0.5
Nitriding steel	950 - 1300	31CrMoV9	1.8519	55 - 60	50 - 55	35 - 45	0.125 - 0.16		0.16 - 0.25	0.25 - 0.315	0.315 - 0.4
Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	30 - 35	25 - 30	25 - 30	0.125 - 0.16		0.16 - 0.25	0.25 - 0.315	0.315 - 0.4
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	30 - 40	30 - 35	25 - 30		0.1 - 0.125	0.125 - 0.2	0.2 - 0.25
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	25 - 35	20 - 30	20 - 25	0.1 - 0.125	0.125 - 0.2	0.2 - 0.25	0.25 - 0.315
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120 - 210	120 - 200	120 - 180	0.25 - 0.315	0.315 - 0.5	0.5 - 0.63	0.63 - 0.8
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120 - 155	120 - 145	120 - 135	0.2 - 0.25	0.25 - 0.4	0.4 - 0.5	0.5 - 0.63
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100 - 130	100 - 120	100 - 110	0.2 - 0.25	0.25 - 0.4	0.4 - 0.5	0.5 - 0.63
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	220 - 300	210 - 270	200 - 260	0.25 - 0.315	0.315 - 0.5	0.5 - 0.63	0.63 - 0.8
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	220 - 280	200 - 260	200 - 250	0.25 - 0.315	0.315 - 0.5	0.5 - 0.63	0.63 - 0.8
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 240	180 - 220	180 - 210	0.2 - 0.25	0.25 - 0.4	0.4 - 0.5	0.5 - 0.63
	Copper alloy (bronze) short-chipping	Up to 850	CuNi2Zn24	2.0730	200 - 240	180 - 220	180 - 210	0.2 - 0.25	0.25 - 0.4	0.4 - 0.5	0.5 - 0.63
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 240	180 - 220	180 - 210	0.2 - 0.25	0.25 - 0.4	0.4 - 0.5	0.5 - 0.63
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	200 - 240	180 - 220	180 - 210	0.2 - 0.25	0.25 - 0.4	0.4 - 0.5	0.5 - 0.63
	Thermoplastic		PVC		200 - 240	180 - 220	180 - 210	0.2 - 0.25	0.25 - 0.4	0.4 - 0.5	0.5 - 0.63
Thermoset		Melamine		200 - 240	180 - 220	180 - 210	0.2 - 0.25	0.25 - 0.4	0.4 - 0.5	0.5 - 0.63	
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 40	30 - 35	25 - 30	0.1 - 0.125	0.125 - 0.2	0.2 - 0.25	0.25 - 0.315
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	25 - 35	30 - 35	25 - 30	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	20 - 25	20 - 22	18 - 22	0.08 - 0.1	0.1 - 0.16	0.16 - 0.2	0.2 - 0.25

## SARA® SARADRILL solid drilling tool



• Please adjust these guideline values according to clamping operation and machine set-up!

104501....  
104550....  
104555....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						49 - 65	65 - 100	100 - 150	150 - 210	210-270
						P	Machining steel	Up to 700	9 SMn 28	1.0715
Unalloyed structural steel	Up to 700	St-52	1.0052	25 - 35	0.16 - 0.2		0.16 - 0.2	0.16 - 0.2	0.16 - 0.2	0.16 - 0.2
Structural steel	700 - 950	Ck45	1.1191	18 - 22	0.16 - 0.2		0.16 - 0.2	0.16 - 0.2	0.16 - 0.2	0.16 - 0.2
Cast steel	Up to 950	GS 40	1.0416	25 - 30	0.12 - 0.18		0.12 - 0.18	0.12 - 0.18	0.12 - 0.18	0.12 - 0.18
Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	15 - 25	0.12 - 0.18		0.12 - 0.18	0.12 - 0.18	0.12 - 0.18	0.12 - 0.18
Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	15 - 25	0.12 - 0.16		0.12 - 0.16	0.12 - 0.16	0.12 - 0.16	0.12 - 0.16
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	15-20	0.16 - 0.2	0.16 - 0.2	0.16 - 0.2	0.16 - 0.2	0.16 - 0.2
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	10 - 12	0.12 - 0.15	0.12 - 0.15	0.12 - 0.15	0.12 - 0.15	0.12 - 0.15
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	20-25	0.15 - 0.18	0.15 - 0.18	0.15 - 0.18	0.15 - 0.18	0.15 - 0.18
	Ductile iron	Up to 280 HB	GGG 60	0.7060	20-25	0.15 - 0.18	0.15 - 0.18	0.15 - 0.18	0.15 - 0.18	0.15 - 0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	50 - 70	0.16 - 0.2	0.16 - 0.2	0.16 - 0.2	0.16 - 0.2	0.16 - 0.2


**PXD Indexable insert drill bit**


• Please adjust these guideline values according to clamping operation and machine set-up!

125303....

125305....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm					
						14	15	16	17	18	19
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Structural steel	700 - 950	Ck45	1.1191	60 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	80 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	80 - 120	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60 - 100	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	60 - 100	0,21 - 0,35	0,23 - 0,38	0,24 - 0,4	0,26 - 0,43	0,27 - 0,45	0,29 - 0,48
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80 - 180	0,28 - 0,42	0,3 - 0,45	0,32 - 0,48	0,34 - 0,51	0,36 - 0,54	0,38 - 0,57
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 180	0,28 - 0,42	0,3 - 0,45	0,32 - 0,48	0,34 - 0,51	0,36 - 0,54	0,38 - 0,57
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	80 - 180	0,28 - 0,42	0,3 - 0,45	0,32 - 0,48	0,34 - 0,51	0,36 - 0,54	0,38 - 0,57
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	80 - 180	0,28 - 0,42	0,3 - 0,45	0,32 - 0,48	0,34 - 0,51	0,36 - 0,54	0,38 - 0,57
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	80 - 180	0,28 - 0,42	0,3 - 0,45	0,32 - 0,48	0,34 - 0,51	0,36 - 0,54	0,38 - 0,57
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	80 - 180	0,28 - 0,42	0,3 - 0,45	0,32 - 0,48	0,34 - 0,51	0,36 - 0,54	0,38 - 0,57

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm					
						20	21	22	23	24	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Structural steel	700 - 950	Ck45	1.1191	60 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	80 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	80 - 120	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60 - 100	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	60 - 100	0,3 - 0,5	0,32 - 0,53	0,33 - 0,55	0,35 - 0,58	0,36 - 0,6	0,38 - 0,63
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	80 - 180	0,4 - 0,6	0,42 - 0,63	0,44 - 0,66	0,46 - 0,69	0,48 - 0,72	0,5 - 0,75
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 180	0,4 - 0,6	0,42 - 0,63	0,44 - 0,66	0,46 - 0,69	0,48 - 0,72	0,5 - 0,75
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	80 - 180	0,4 - 0,6	0,42 - 0,63	0,44 - 0,66	0,46 - 0,69	0,48 - 0,72	0,5 - 0,75
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	80 - 180	0,4 - 0,6	0,42 - 0,63	0,44 - 0,66	0,46 - 0,69	0,48 - 0,72	0,5 - 0,75
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	80 - 180	0,4 - 0,6	0,42 - 0,63	0,44 - 0,66	0,46 - 0,69	0,48 - 0,72	0,5 - 0,75
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	80 - 180	0,4 - 0,6	0,42 - 0,63	0,44 - 0,66	0,46 - 0,69	0,48 - 0,72	0,5 - 0,75

## Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com


**PHOENIX PD Indexable inserts solid drill bit**


• Please adjust these guideline values according to clamping operation and machine set-up!

124202.... 124203....  
124204.... 124205....

**2 x D, 3 x D**

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm							
						12 - 14,5	15 - 16,5	17 - 18,5	19 - 20,5	21 - 24,5	25 - 28,5	29 - 33,5	34 - 63
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 250	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,12	0,05 - 0,15	0,05 - 0,18
	Structural steel	700 - 950	Ck45	1.1191	150 - 250	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,12	0,05 - 0,15	0,05 - 0,18
	Tempering steel	500 - 950	42 CrMo4	1.7225	100 - 220	0,04 - 0,12	0,04 - 0,14	0,04 - 0,16	0,04 - 0,18	0,04 - 0,2	0,06 - 0,25	0,08 - 0,3	0,08 - 0,35
	Tempering steel	950 - 1300	43CrMo4	1.3563	80 - 180	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,15	0,06 - 0,2	0,08 - 0,25	0,08 - 0,25
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	80 - 180	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,15	0,06 - 0,2	0,08 - 0,25	0,08 - 0,25
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80 - 180	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,15	0,06 - 0,2	0,08 - 0,25	0,08 - 0,25
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 180	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,15	0,06 - 0,2	0,08 - 0,25	0,08 - 0,25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 280	0,04 - 0,14	0,04 - 0,14	0,04 - 0,16	0,04 - 0,2	0,08 - 0,25	0,06 - 0,3	0,08 - 0,3	0,08 - 0,35
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 220	0,04 - 0,1	0,04 - 0,12	0,04 - 0,14	0,04 - 0,18	0,04 - 0,2	0,06 - 0,25	0,08 - 0,25	0,08 - 0,25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	100 - 500	0,04 - 0,12	0,04 - 0,12	0,04 - 0,16	0,04 - 0,2	0,04 - 0,25	0,06 - 0,3	0,08 - 0,25	0,08 - 0,3
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	100 - 500	0,04 - 0,12	0,04 - 0,12	0,04 - 0,16	0,04 - 0,2	0,04 - 0,25	0,06 - 0,3	0,08 - 0,3	0,08 - 0,3
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 100	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,15	0,06 - 0,2	0,08 - 0,2	0,08 - 0,2
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 50	0,02 - 0,06	0,02 - 0,06	0,03 - 0,06	0,03 - 0,06	0,04 - 0,08	0,06 - 0,1	0,06 - 0,12	0,06 - 0,12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	40 - 80	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1

**4 x D**

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm							
						12 - 14,5	15 - 16,5	17 - 18,5	19 - 20,5	21 - 24,5	25 - 28,5	29 - 33,5	34 - 63
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 250	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,1	0,04 - 0,12	0,04 - 0,12	0,05 - 0,15	0,05 - 0,18
	Structural steel	700 - 950	Ck45	1.1191	150 - 250	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,1	0,04 - 0,12	0,04 - 0,12	0,05 - 0,15	0,05 - 0,18
	Tempering steel	500 - 950	42 CrMo4	1.7225	100 - 220	0,04 - 0,12	0,04 - 0,14	0,04 - 0,16	0,04 - 0,18	0,04 - 0,15	0,06 - 0,25	0,08 - 0,25	0,08 - 0,3
	Tempering steel	950 - 1300	43CrMo4	1.3563	80 - 180	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,13	0,06 - 0,2	0,08 - 0,25	0,08 - 0,25
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	80 - 180	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,13	0,06 - 0,2	0,08 - 0,25	0,08 - 0,25
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80 - 180	0,04 - 0,1	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,06 - 0,2	0,08 - 0,2	0,08 - 0,2
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 180	0,04 - 0,1	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,06 - 0,2	0,08 - 0,2	0,08 - 0,2
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 280	0,04 - 0,12	0,04 - 0,14	0,04 - 0,16	0,04 - 0,2	0,04 - 0,15	0,06 - 0,3	0,08 - 0,3	0,08 - 0,3
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 220	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,15	0,04 - 0,15	0,06 - 0,25	0,08 - 0,25	0,08 - 0,25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	100 - 500	0,04 - 0,12	0,04 - 0,12	0,04 - 0,12	0,04 - 0,2	0,04 - 0,2	0,04 - 0,3	0,08 - 0,3	0,08 - 0,3
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	100 - 500	0,04 - 0,12	0,04 - 0,12	0,04 - 0,12	0,04 - 0,2	0,04 - 0,2	0,04 - 0,3	0,08 - 0,3	0,08 - 0,3
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 100	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,1	0,04 - 0,2	0,08 - 0,2	0,08 - 0,2
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 50	0,02 - 0,06	0,02 - 0,06	0,02 - 0,06	0,02 - 0,06	0,04 - 0,08	0,06 - 0,1	0,06 - 0,12	0,06 - 0,12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	40 - 80	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1

**5 x D**

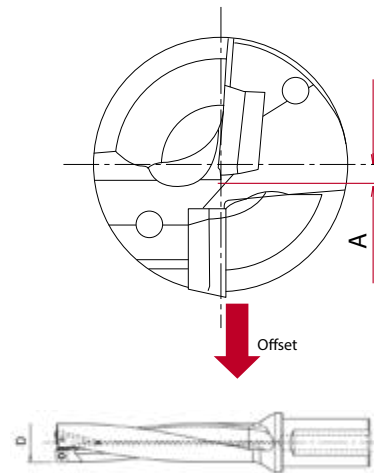
ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm							
						12 - 14,5	15 - 16,5	17 - 18,5	19 - 20,5	21 - 24,5	25 - 28,5	29 - 33,5	34 - 63
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 250	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,12	0,05 - 0,15	0,05 - 0,18
	Structural steel	700 - 950	Ck45	1.1191	150 - 250	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,12	0,05 - 0,15	0,05 - 0,18
	Tempering steel	500 - 950	42 CrMo4	1.7225	100 - 220	0,04 - 0,09	0,04 - 0,09	0,04 - 0,12	0,04 - 0,14	0,04 - 0,15	0,06 - 0,2	0,08 - 0,2	0,08 - 0,25
	Tempering steel	950 - 1300	43CrMo4	1.3563	80 - 180	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,1	0,04 - 0,13	0,06 - 0,15	0,08 - 0,18	0,08 - 0,22
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	80 - 180	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,1	0,04 - 0,13	0,06 - 0,15	0,08 - 0,18	0,08 - 0,22
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80 - 180	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,09	0,04 - 0,1	0,06 - 0,15	0,06 - 0,18	0,06 - 0,2
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 180	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,09	0,04 - 0,1	0,06 - 0,15	0,06 - 0,18	0,06 - 0,2
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 280	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,13	0,04 - 0,15	0,06 - 0,2	0,08 - 0,2	0,08 - 0,25
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 220	0,04 - 0,09	0,04 - 0,09	0,04 - 0,12	0,04 - 0,12	0,04 - 0,13	0,06 - 0,15	0,08 - 0,18	0,08 - 0,25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	100 - 500	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,15	0,04 - 0,15	0,06 - 0,25	0,08 - 0,3	0,08 - 0,3
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	100 - 500	0,04 - 0,1	0,04 - 0,1	0,04 - 0,12	0,04 - 0,15	0,04 - 0,15	0,06 - 0,25	0,08 - 0,3	0,08 - 0,3
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 100	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,08	0,04 - 0,1	0,06 - 0,15	0,08 - 0,15	0,08 - 0,15
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 50	0,02 - 0,06	0,02 - 0,06	0,02 - 0,06	0,02 - 0,06	0,02 - 0,06	0,06 - 0,08	0,06 - 0,08	0,06 - 0,08
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	40 - 80	0,04 - 0,07	0,04 - 0,07	0,04 - 0,07	0,04 - 0,07	0,04 - 0,08	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1

Solid drill bit radial adjustment

D mm	D + A Offset mm	D Max. mm
12	0,4	12,8
12,5	0,4	13,3
12,7	0,3	13,3
13	0,3	13,6
13,5	0,2	13,9
14	0,2	14,4
14,5	0,1	14,7
15	0,4	15,8
15,5	0,3	16,1
16	0,3	16,6
16,5	0,3	17,1
17	0,6	18,2
17,5	0,5	18,5
18	0,5	19
18,5	0,4	19,3
19	0,6	20,2
19,5	0,5	20,5
20	0,4	20,8
20,5	0,4	21,3
21	1	23
21,5	0,9	23,3
22	0,8	23,6
22,5	0,7	23,9
23	0,5	24
23,5	0,4	24,3
24	0,3	24,6
24,5	0,2	24,9
25	1,1	27,2
25,5	0,9	27,3
26	0,8	27,6

D mm	D + A Offset mm	D Max. mm
26,5	0,7	27,9
27	0,6	28,2
28	0,3	28,6
28,5	0,2	28,9
29	1,3	31,6
30	1,1	32,2
31	0,8	32,6
32	0,6	33,2
33	0,3	33,6
33,5	0,2	33,9
34	1,1	36,2
35	0,8	36,6
36	0,8	37,6
37	0,6	38,2
38	0,3	38,6
39	1,0	41,0
40	0,9	41,8
41	0,8	42,6
42	0,6	43,2
43	0,5	44,0
44	0,3	44,6
45	0,9	46,8
46	0,8	47,6
47	0,7	48,4
48	0,5	49,0
49	0,3	49,6
50	1,1	52,2
51	1,0	53,0
52	0,8	53,6
53	0,7	54,4

D mm	D + A Offset mm	D Max. mm
54	0,6	55,2
55	0,4	55,8
56	0,1	56,2
57	1,1	59,2
58	1,0	60,0
59	0,9	60,8
60	0,8	61,6
61	0,6	62,2
62	0,4	62,8
63	0,2	63,4



palbit Core and countersink drill SPOT FACE




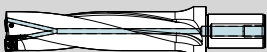
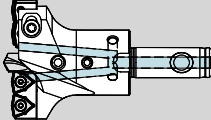
Please adjust these guideline values according to clamping operation and machine set-up!

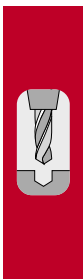
124700....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min		
					◀ Wear resistance		Toughness ▶
					PH6920	PH6930	PHC930
P	Machining steel	Up to 700	9 SMn 28	1.0715	180 - 250	160 - 240	160 - 240
	Unalloyed structural steel	Up to 700	St-52	1.0052	180 - 250	160 - 240	160 - 240
	Structural steel	700 - 950	Ck45	1.1191	160 - 220	140 - 200	140 - 200
	Tempering steel	500 - 950	42 CrMo4	1.7225	160 - 220	140 - 200	140 - 200
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	160 - 220	140 - 200	140 - 200
	Tempering steel	950 - 1300	43CrMo4	1.3563	160 - 220	140 - 200	140 - 200
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	160 - 220	140 - 200	140 - 200
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	130 - 180	110 - 160	110 - 160
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	170 - 230	140 - 210	140 - 210
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	140 - 180	120 - 190	120 - 190
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	140 - 180	120 - 190	120 - 190
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180 - 250	150 - 220	150 - 220
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	130 - 200	110 - 180	110 - 180
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130 - 200	110 - 180	110 - 180

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz/tooth				
					SPKX 05...	SPKX 06...	SPKX 07...	SPKX 09...	SPKX 11...
P	Machining steel	bis 700	9 SMn 28	1.0715	0,05 - 0,08	0,06 - 0,10	0,06 - 0,12	0,07 - 0,13	0,08 - 0,15
	Unalloyed structural steel	bis 700	St-52	1.0052	0,05 - 0,08	0,06 - 0,10	0,06 - 0,12	0,07 - 0,13	0,08 - 0,15
	Structural steel	700 - 950	Ck45	1.1191	0,06 - 0,12	0,08-0,15	0,10 - 0,18	0,12 - 0,22	0,12 - 0,25
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,06 - 0,12	0,08-0,15	0,10 - 0,18	0,12 - 0,22	0,12 - 0,25
	Case-hardened steel	bis 1200	16 MnCr 5	1.7131	0,06 - 0,12	0,08-0,15	0,10 - 0,18	0,12 - 0,22	0,12 - 0,25
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,06 - 0,12	0,08-0,15	0,10 - 0,18	0,12 - 0,22	0,12 - 0,25
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0,06 - 0,12	0,08-0,15	0,10 - 0,18	0,12 - 0,22	0,12 - 0,25
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0,06 - 0,10	0,08-0,15	0,10 - 0,20	0,12 - 0,23	0,12 - 0,26
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15	0,09 - 0,16	0,10 - 0,20
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15	0,09 - 0,16	0,10 - 0,20
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,04 - 0,08	0,05 - 0,11	0,06 - 0,13	0,07 - 0,14	0,08 - 0,19
K	Grey cast iron	bis 260 HB	GG 25	0.6025	0,06 - 0,12	0,08 - 0,16	0,12 - 0,20	0,15 - 0,25	0,15 - 0,30
	Alloyed grey cast iron	bis 310 HB	GGL-NiCr 35 2	0.6678	0,06 - 0,10	0,08 - 0,15	0,10 - 0,18	0,12 - 0,20	0,15 - 0,25
	Ductile iron	bis 280 HB	GGG 60	0.7060	0,06 - 0,10	0,08 - 0,15	0,10 - 0,18	0,12 - 0,20	0,15 - 0,25

palbit  Overview of drilling systems

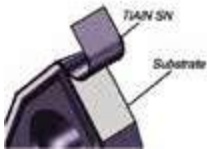
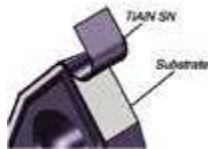
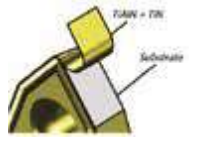
		Diameter (mm)									
		03	12	20	32	50	60	70	80	110	180
Jet Drill							 L1 max. = 320 mm				
				 L1 max. = 200 mm							
							 L1 max. = 240 mm				
				 L1 max. = 174 mm							
Vortex Drill						 L1 max. = 900 mm					



palbit  Type descriptions

- Carbide, coated

**PVD types**

<p>PH6920 (P10-P35) (M10-M25) (K10-K30) (S10-S30)</p>  <p>PVD-coated (TiAlN), fine grade carbide for universal applications. Good toughness and wear resistance.</p>	<p>PH6930 (P20-P40) (M20-M30) (K20-K40) (S20-S40)</p>  <p>PVD-coated (TiAlN) superfine grain carbide for applications under unstable machine conditions at average cutting speeds.</p>	<p>PHC930 (P20-P40) (M20-M30) (K20-K40) (S20-S40)</p>  <p>PVD-coated (TiAlN+TiN), fine grain carbide type for general machining of steel, stainless steel, cast iron and superalloys with high cutting speeds.</p>
---	---	---

**Type recommendation**

- **Note:** The recommendation applies to steel, high-alloy steels and heat-resistant steels.







**Cutting data recommendations**

124303....

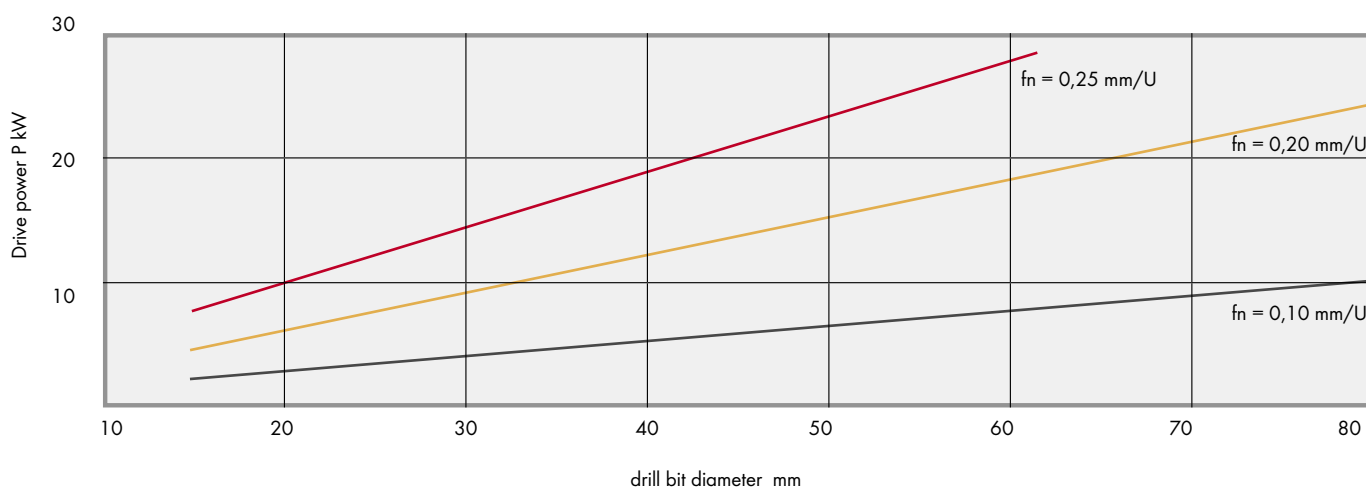
124313....

• Please adjust these guideline values according to clamping operation and machine set-up!

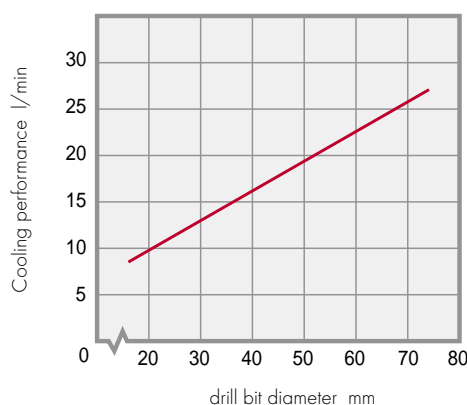
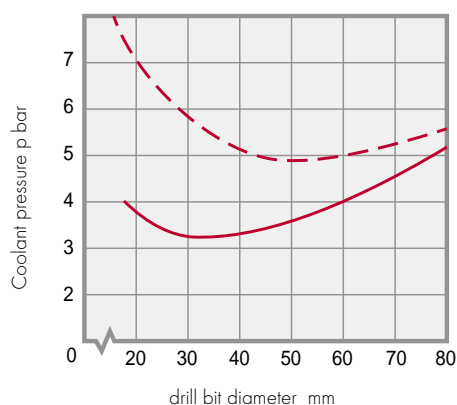
ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm						
						13 - 15,5	16 - 20	20,5 - 25	25,5 - 30	31 - 41	42 - 58	59 - 80
P	Machining steel	Up to 700	9 SMn 28	1.0715	180 - 260	0,05 - 0,08	0,06 - 0,10	0,07 - 0,12	0,09 - 0,15	0,11 - 0,18	0,15 - 0,28	0,11 - 0,18
	Structural steel	700 - 950	Ck45	1.1191	180 - 260	0,05 - 0,08	0,06 - 0,10	0,07 - 0,12	0,09 - 0,15	0,11 - 0,18	0,15 - 0,28	0,11 - 0,18
	Tempering steel	500 - 950	42 CrMo4	1.7225	150 - 240	0,05 - 0,08	0,06 - 0,10	0,07 - 0,12	0,09 - 0,15	0,11 - 0,18	0,15 - 0,28	0,11 - 0,18
	Tempering steel	950 - 1300	43CrMo4	1.3563	120 - 240	0,05 - 0,08	0,06 - 0,10	0,07 - 0,12	0,09 - 0,15	0,11 - 0,18	0,15 - 0,28	0,11 - 0,18
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130 - 220	0,05 - 0,08	0,06 - 0,10	0,07 - 0,12	0,09 - 0,15	0,11 - 0,18	0,15 - 0,28	0,11 - 0,18
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	150 - 220	0,04 - 0,08	0,05 - 0,09	0,06 - 0,12	0,07 - 0,13	0,08 - 0,16	0,10 - 0,20	0,08 - 0,16
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	150 - 220	0,04 - 0,08	0,05 - 0,09	0,06 - 0,12	0,07 - 0,13	0,08 - 0,16	0,10 - 0,20	0,08 - 0,16
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 250	0,05 - 0,11	0,07 - 0,13	0,08 - 0,12	0,10 - 0,18	0,14 - 0,26	0,18 - 0,35	0,14 - 0,26
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120 - 200	0,05 - 0,11	0,06 - 0,13	0,07 - 0,12	0,08 - 0,18	0,14 - 0,26	0,18 - 0,35	0,14 - 0,26
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300 - 380	0,04 - 0,06	0,05 - 0,07	0,06 - 0,08	0,07 - 0,09	0,10 - 0,14	0,12 - 0,17	0,10 - 0,14
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	260 - 330	0,04 - 0,06	0,05 - 0,07	0,06 - 0,08	0,07 - 0,09	0,10 - 0,14	0,12 - 0,17	0,10 - 0,14
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	40 - 80	0,03 - 0,05	0,04 - 0,06	0,04 - 0,07	0,05 - 0,08	0,06 - 0,10	0,07 - 0,13	0,06 - 0,10
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30 - 50	0,03 - 0,05	0,04 - 0,06	0,04 - 0,07	0,05 - 0,08	0,06 - 0,10	0,07 - 0,13	0,06 - 0,10

**Power requirement**

- This diagram is based on machining experience of steels with a hardness of 200-250 HB and a cutting speed of 100 m/min
- For cast iron machining, the power requirement is approx. 30 % lower



**Coolant recommendation**



**palbit**  **Solid drill bit radial adjustment TDS/TDC**

D mm	Solid drill bit radial adjustment	D max. mm
13,00	1,50	16,00
13,50	1,50	16,50
14,00	1,50	17,00
14,50	1,50	17,50
15,00	1,50	18,00
15,50	1,50	18,50
16,00	1,50	19,00
16,50	1,50	19,50
17,00	1,50	20,00
17,50	1,50	20,50
18,00	1,40	20,80
18,50	1,30	21,10
19,00	1,20	21,40
20,00	1,00	22,00
21,00	1,60	24,20
22,00	1,50	25,00
23,00	1,25	25,50
24,00	1,00	26,00
25,00	0,80	26,60
26,00	2,50	31,00
27,00	2,20	31,40
28,00	2,10	32,20
29,00	1,80	32,60
30,00	1,50	33,00
31,00	3,50	38,00
32,00	3,20	38,40



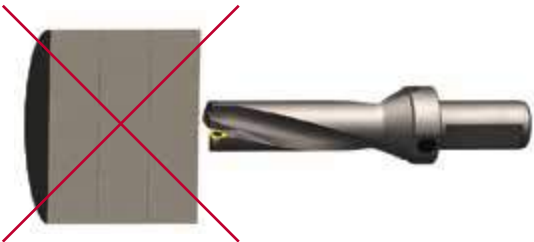

D mm	Solid drill bit radial adjustment	D max. mm
33,00	3,00	39,00
34,00	2,80	39,60
35,00	2,50	40,00
36,00	2,30	40,60
37,00	2,00	41,00
38,00	1,80	41,60
39,00	1,50	42,00
40,00	1,20	42,40
41,00	1,00	43,00
42,00	4,20	50,40
43,00	4,00	51,00
44,00	3,70	51,40
45,00	3,50	52,00
46,00	3,30	52,60
47,00	3,00	53,00
48,00	2,70	53,40
49,00	2,50	54,00
50,00	2,20	54,40
51,00	2,00	55,00
52,00	1,80	55,60
53,00	1,50	56,00
54,00	1,20	56,40
55,00	0,80	56,60
56,00	0,60	57,20
58,00	0,40	58,80



Deep drilling ...

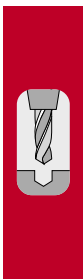
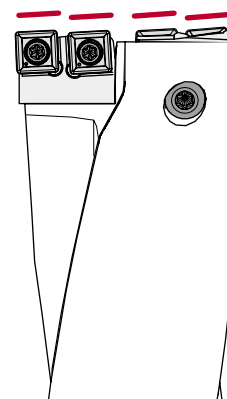
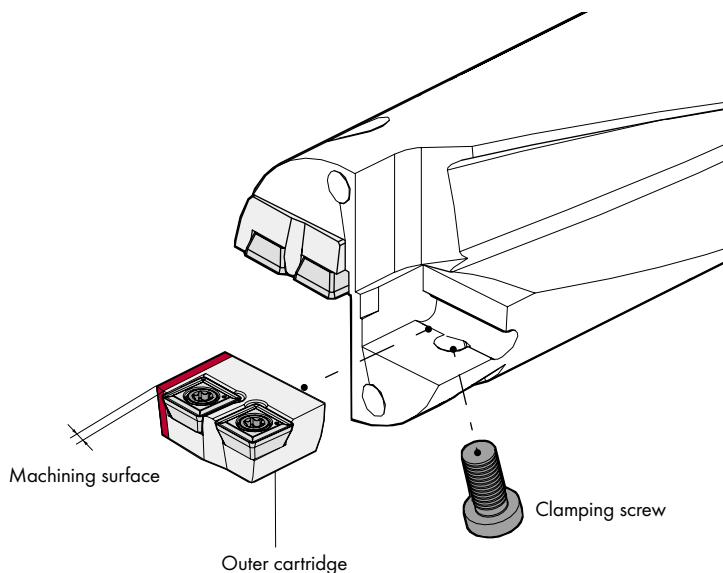
... with brainpower.

**ATORN**<sup>®</sup>  
Performance demands quality

Application	Description
<p style="text-align: center;"><b>Drilling on inclined surfaces</b></p> 	<p>Drilling of an inclined surface is possible up to a 30° incline without reducing the cutting parameters. Reduce feed force by 50 % on the incline for angles between 30° and 40°.</p>
<p style="text-align: center;"><b>Interrupted cutting</b></p> 	<p>For reliable drilling, reduce cutting force and feed by 30 % for the greatest possible stability of machine and clamp.</p>
<p style="text-align: center;"><b>Bundled drilling</b></p> 	<p>Series TDS and TDS drill bits are not suitable for this, as they create a disc in the bore diameter when exiting the material which prevents the drilling of subsequent material.</p> <p>Attention: In through-hole drilling these discs also occur upon exit. With a fixed drill bit and rotating workpiece, these can fly out uncontrolled from the workpiece. Please use enclosed machines and wear adequate occupational safety equipment.</p>
<p style="text-align: center;"><b>Drilling</b></p> 	<p>For drilling tasks with TDS and TSC Series, turn the drill bit in the direction of the indexable cutting inserts. Observe the wear on the outer cutting edges, the greater chip volume can shorten the change intervals.</p>

**palbit** Cartridge system

- Diameter adjustment 5 mm
- Loosen clamping screw on the outer cartridge and dismantle cartridge
- Cartridge is shortened on the outer diameter to the desired drill diameter
- Deburr shortened cartridge
- Press cartridge against the contact surface when screwing tight



**palbit** SCS/SCC Indexable inserts solid drill bit



**Cutting data recommendations**

- Please adjust these guideline values according to clamping operation and machine set-up!

124403....  
124404....

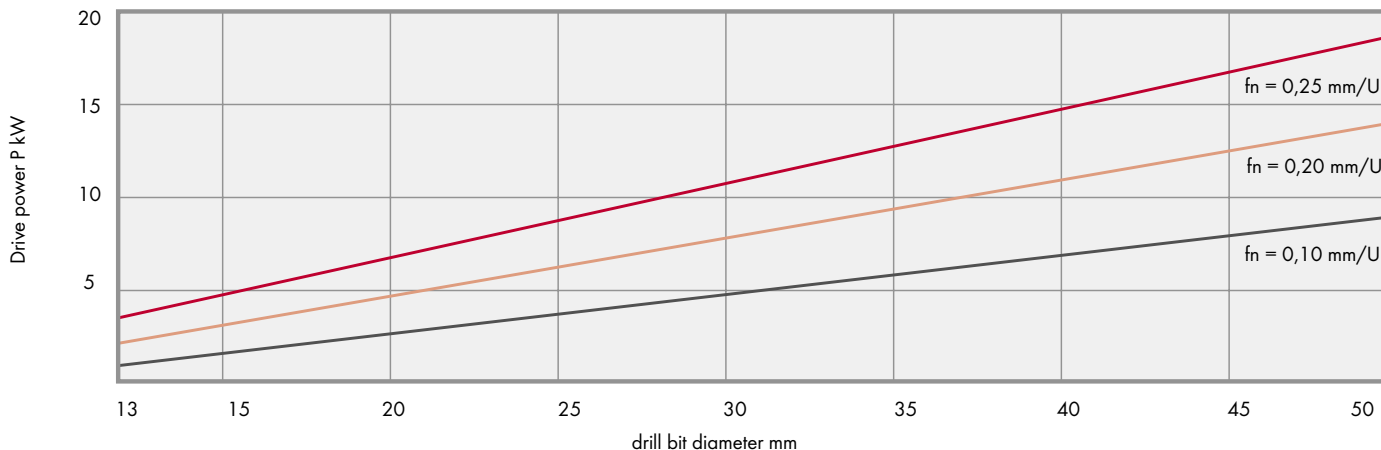
124413....  
124414....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						13 - 15	15,5 - 21,5	22 - 27,5	28 - 33	34 - 41
P	Machining steel	Up to 700	9 SMn 28	1.0715	180 - 250	0,05 - 0,08	0,06 - 0,10	0,06 - 0,12	0,07 - 0,13	0,08 - 0,15
	Structural steel	700 - 950	Ck45	1.1191	180 - 250	0,05 - 0,08	0,06 - 0,10	0,06 - 0,12	0,07 - 0,13	0,08 - 0,15
	Tempering steel	500 - 950	42 CrMo4	1.7225	160 - 220	0,06 - 0,12	0,08 - 0,15	0,10 - 0,18	0,12 - 0,22	0,12 - 0,24
	Tempering steel	950 - 1300	43CrMo4	1.3563	150 - 220	0,06 - 0,12	0,08 - 0,14	0,10 - 0,18	0,12 - 0,22	0,12 - 0,23
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130 - 180	0,06 - 0,10	0,08 - 0,15	0,10 - 0,20	0,12 - 0,23	0,12 - 0,24
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	170 - 240	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15	0,09 - 0,16	0,10 - 0,17
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	170 - 240	0,05 - 0,10	0,06 - 0,12	0,08 - 0,15	0,09 - 0,16	0,10 - 0,17
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180 - 250	0,06 - 0,12	0,08 - 0,16	0,12 - 0,20	0,15 - 0,25	0,16 - 0,28
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130 - 200	0,06 - 0,10	0,08 - 0,15	0,10 - 0,18	0,12 - 0,20	0,15 - 0,23
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	330 - 380	0,06 - 0,14	0,08 - 0,15	0,10 - 0,20	0,12 - 0,22	0,14 - 0,23
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	330 - 380	0,06 - 0,14	0,08 - 0,15	0,10 - 0,20	0,12 - 0,22	0,14 - 0,23
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 60	0,05 - 0,10	0,06 - 0,14	0,08 - 0,18	0,10 - 0,22	0,12 - 0,22
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30 - 50	0,05 - 0,10	0,06 - 0,14	0,08 - 0,18	0,10 - 0,22	0,12 - 0,22

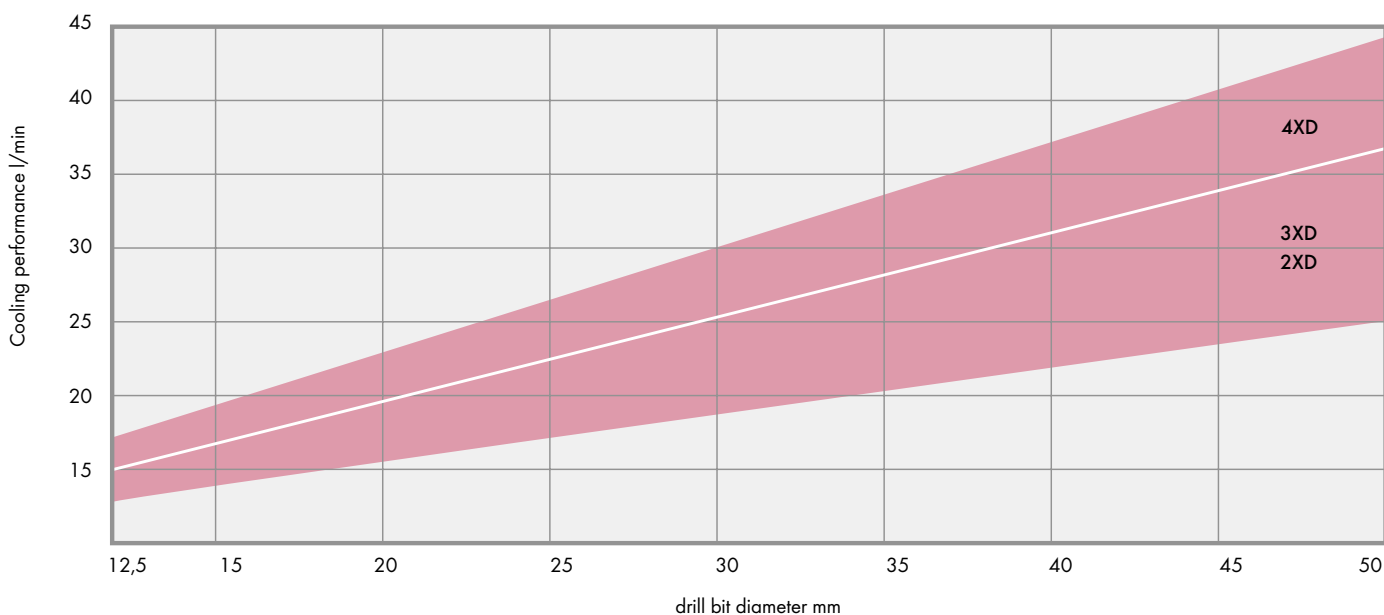
ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						42 - 50	50 - 60	60 - 75	75 - 80
P	Machining steel	Up to 700	9 SMn 28	1.0715	180 - 250	0,08 - 0,16	0,06 - 0,12	0,08 - 0,12	0,08 - 0,12
	Structural steel	700 - 950	Ck45	1.1191	180 - 250	0,08 - 0,16	0,06 - 0,12	0,08 - 0,12	0,08 - 0,12
	Tempering steel	500 - 950	42 CrMo4	1.7225	160 - 220	0,13 - 0,25	0,10 - 0,14	0,12 - 0,18	0,11 - 0,18
	Tempering steel	950 - 1300	43CrMo4	1.3563	150 - 220	0,13 - 0,24	0,08 - 0,15	0,10 - 0,18	0,10 - 0,18
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130 - 180	0,13 - 0,25	0,08 - 0,14	0,09 - 0,15	0,09 - 0,14
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	170 - 240	0,11 - 0,19	0,06 - 0,13	0,08 - 0,15	0,08 - 0,14
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	170 - 240	0,11 - 0,19	0,06 - 0,13	0,08 - 0,15	0,08 - 0,14
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180 - 250	0,18 - 0,30	0,12 - 0,20	0,15 - 0,20	0,15 - 0,20
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130 - 200	0,16 - 0,25	0,10 - 0,15	0,09 - 0,18	0,10 - 0,18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	330 - 380	0,15 - 0,26	0,14 - 0,20	0,14 - 0,23	0,15 - 0,23
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	330 - 380	0,15 - 0,26	0,14 - 0,20	0,14 - 0,23	0,15 - 0,23
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 60	0,14 - 0,24	0,10 - 0,15	0,10 - 0,15	0,10 - 0,15
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30 - 50	0,14 - 0,24	0,10 - 0,15	0,10 - 0,15	0,10 - 0,15

**Power requirement**

- This diagram is based on machining experience of steels with a hardness of 200-250 HB and a cutting speed of 100 m/min
- For cast iron machining, the power requirement is approx. 30 % lower



**Coolant recommendation**



**YOUR DRILL**  
**GIVES UP.** • **WHAT DO YOU DO? YOU REACH**  
**FOR A NEW ONE**

**AND SIMPLY CARRY ON:**  
**SARA®GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
 A BRAND OF SARTORIUS WERKZEUGE

**palbit**  Solid drill bit radial adjustment SCS

D mm	Solid drill bit radial adjustment	D max mm
13	0,50	14,0
14	0,50	15,0
15	0,50	16,0
16	0,50	17,0
17	0,50	18,0
18	0,50	19,0
19	0,50	20,0
20	0,50	21,0
21	0,25	21,5
22	0,50	23,0
23	0,50	24,0
24	0,50	25,0
25	0,50	26,0
26	0,25	26,5
27	0,25	27,5
28	0,50	29,0
29	0,50	30,0
30	0,50	31,0
31	0,25	31,5

D mm	Solid drill bit radial adjustment	D max mm
32	0,25	32,5
33	0,25	33,5
34	0,50	35,0
35	0,50	36,0
36	0,50	37,0
37	0,50	38,0
38	0,50	39,0
39	0,50	40,0
40	0,25	40,5
41	0,25	41,5
42	0,50	43,0
43	0,50	44,0
44	0,50	45,0
45	0,50	46,0
46	0,50	47,0
47	0,50	48,0
48	0,25	48,5
49	0,25	49,5
50	0,25	50,5





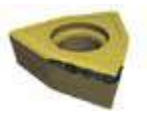

... optimal chip control.

**ATORN**<sup>®</sup>  
Performance demands quality



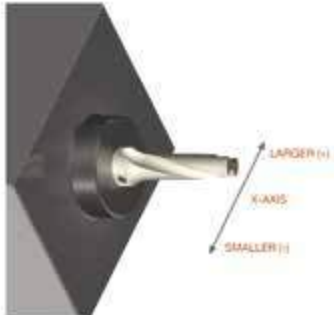
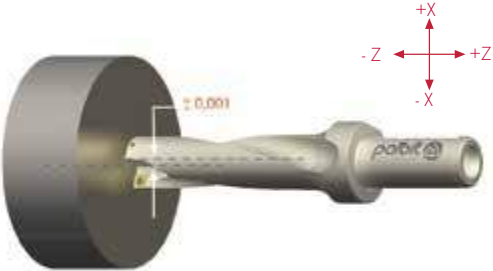
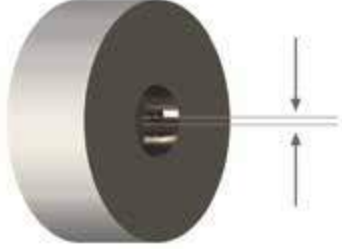
- **Note:** When drilling through-holes, a disc is created when the drill bit exits. With a fixed drill bit and rotating workpiece, these can be forced out. Protect the operator and personnel with adequate occupational safety equipment. When the drill bit exits the material, a small recess is created as the pilot drill bit is no longer in the cut.



Problem	Corrective measures
<p style="text-align: center;"><b>Nicks</b></p> 	<p>Use on lathes:</p> <ul style="list-style-type: none"> <li>• Check machine settings</li> <li>• If the tool clamping cannot be improved, reduce feed by 30 %</li> <li>• If machine or tool clamping is unstable, reduce feed by 30 %</li> </ul> <p><b>Note:</b> Types can be mixed for optimal machining.  <b>Example:</b> PH6930 on inner and PH6920 on outer insert seat</p>
<p style="text-align: center;"><b>Sub-optimal chip removal</b></p> 	<ul style="list-style-type: none"> <li>• Increase pressure and flow of coolant</li> <li>• Increase cutting speed by 20 %</li> </ul>
<p style="text-align: center;"><b>Increased wear</b></p> 	<ul style="list-style-type: none"> <li>• Increase pressure and flow of coolant</li> <li>• Reduce cutting speed by 20 %</li> <li>• Choose a more wear-resistant model</li> </ul>
<p style="text-align: center;"><b>Poor bore quality</b></p> 	<ul style="list-style-type: none"> <li>• Increase pressure and volume of coolant for better chip removal</li> <li>• Increase cutting speed by up to 20 %</li> <li>• Improve workpiece and tool clamping, alternatively reduce feed rate</li> </ul> <p><b>Note:</b> High cutting speeds and low feed rates achieve better surfaces.</p>

**palbit** CUTTING TOOLS SOLUTIONS **Turning work with indexable inserts solid drill bits**

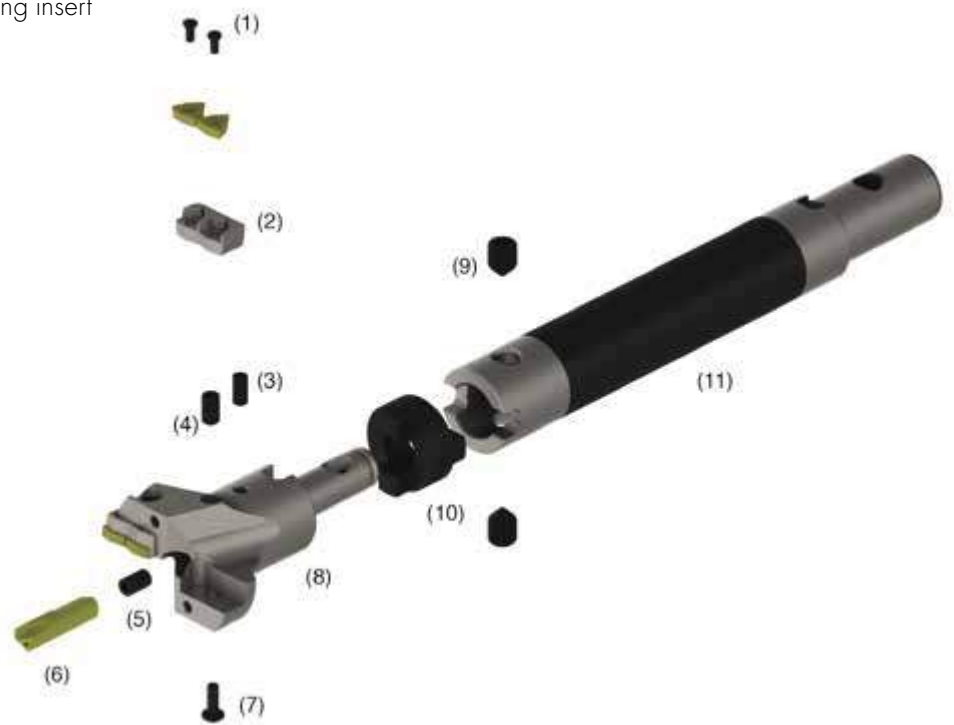
- Notes for use on lathes

Application	Description
<p><b>Axis alignment</b></p> 	<p>The cutting edge of the indexable cutting insert must be parallel to the x-axis of the machine in order to change the bore dimensions by moving the tool. To do this, a surface is applied to the tool shank which runs parallel to the cutting edge. The tool alignment can be oriented towards this.</p>
<p><b>Cutting edge orientation</b></p> 	<p>The outermost cutting edge of the drill bit should be in the (+) direction of the x-axis to allow offset drilling. The inner cutting edge should point towards the operator.</p>
<p><b>Test bore</b></p> 	<p>Please perform a test bore of approx. 5 mm deep to check the setting before producing the finished bore. The setting range is between 0.2 mm and 0.7 mm.</p>



**palbit** Indexable insert drilling system VORTEX DRILL

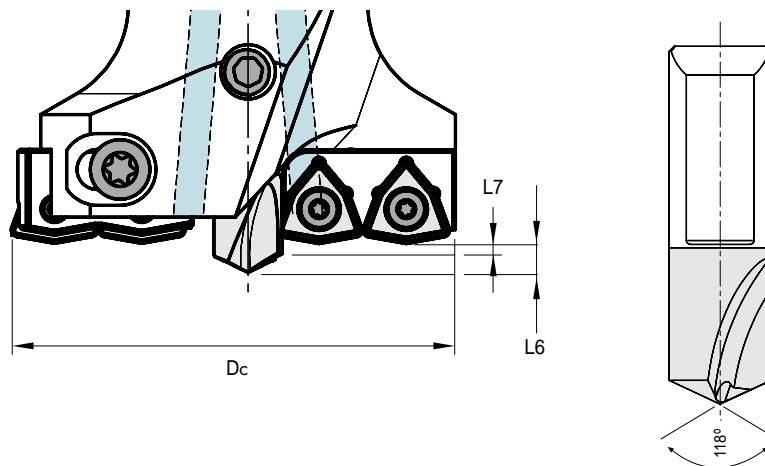
1. Clamping screws for indexable cutting insert
2. Cartridge
3. Clamping screw for pilot drill bit
4. Clamping bolt for pilot drill bit
5. Adjusting screw for pilot drill bit
6. Pilot drill bit
7. Clamping screw for cartridge
8. Boring head
9. Clamping screw for boring head
10. Follower ring
11. Mounting shank or extension



**palbit** Settings pilot drill bit VORTEX DRILL



104519...



Dc mm	2-4 x D		4-6 x D		> 6 x D	
	L7	L6	L7	L6	L7	L6
45-55	1.6	4.0	1.8	4.2	2.0	4.4
55-75	1.8	5.4	2.0	5.6	2.2	5.8
75-100	2.2	6.5	2.5	6.8	2.8	7.1
100-120	2.4	7.7	2.8	8.1	3.2	8.5
120-170	3.2	9.9	3.6	10.3	4.0	10.7
170-180	3.5	12.2	3.9	12.6	4.3	13.0

palbit Cutting data recommendations VORTEX DRILL

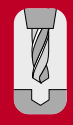


Please adjust these guideline values according to clamping operation and machine set-up!

104503....

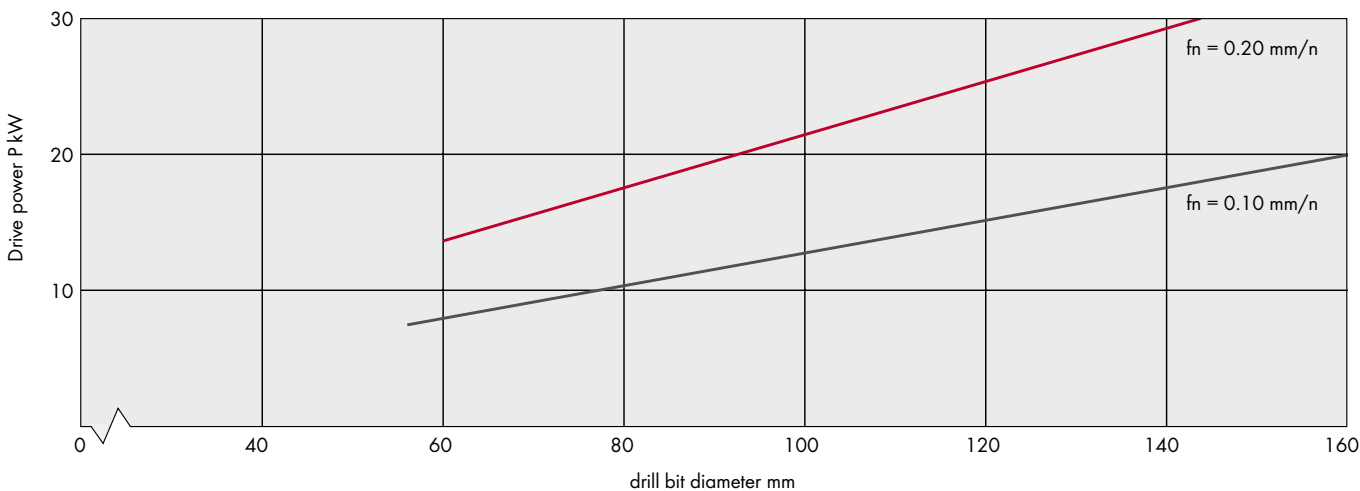
Cutting speed and feed

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed rates in mm/rev based on the tool diameter in mm						
						∅ 45 - 55	∅ 55 - 60	∅ 60 - 75	∅ 75 - 100	∅ 100 - 105	∅ 105 - 150	∅ 150 - 180
P	Machining steel	Up to 700	9 SMn 28	1.0715	120 - 180	0,06 - 0,10	0,07 - 0,11	0,08 - 0,12	0,10 - 0,14	0,14 - 0,20	0,08 - 0,12	0,10 - 0,14
	Unalloyed structural steel	Up to 700	St-52	1.0052	120 - 180	0,06 - 0,10	0,07 - 0,11	0,08 - 0,12	0,10 - 0,14	0,14 - 0,20	0,08 - 0,12	0,10 - 0,14
	Structural steel	700 - 950	Ck45	1.1191	110 - 170	0,06 - 0,10	0,07 - 0,11	0,08 - 0,12	0,10 - 0,14	0,12 - 0,18	0,08 - 0,12	0,10 - 0,14
	Tempering steel	500 - 950	42 CrMo4	1.7225	110 - 170	0,06 - 0,10	0,07 - 0,11	0,08 - 0,12	0,10 - 0,14	0,12 - 0,18	0,08 - 0,12	0,10 - 0,14
	Cast steel	Up to 950	GS 40	1.0416	100 - 160	0,06 - 0,10	0,07 - 0,11	0,08 - 0,12	0,10 - 0,14	0,14 - 0,20	0,08 - 0,12	0,10 - 0,14
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	90 - 130	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	0,06 - 0,10	0,09 - 0,13	0,06 - 0,08	0,06 - 0,10
	Tempering steel	950 - 1300	43CrMo4	1.3563	90 - 130	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	0,06 - 0,10	0,09 - 0,13	0,06 - 0,08	0,06 - 0,10
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 100	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	0,06 - 0,10	0,09 - 0,13	0,06 - 0,08	0,06 - 0,10
M	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 100	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	0,06 - 0,10	0,09 - 0,13	0,06 - 0,08	0,06 - 0,10
	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	60 - 110	0,04 - 0,07	0,04 - 0,11	0,06 - 0,12	0,08 - 0,14	0,10 - 0,18	0,06 - 0,12	0,08 - 0,14
K	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60 - 110	0,04 - 0,07	0,04 - 0,11	0,06 - 0,12	0,08 - 0,14	0,10 - 0,18	0,06 - 0,12	0,08 - 0,14
	Grey cast iron	Up to 260 HB	GG 25	0.6025	120 - 180	0,07 - 0,13	0,07 - 0,15	0,08 - 0,16	0,10 - 0,18	0,12 - 0,22	0,08 - 0,16	0,10 - 0,18
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	120 - 180	0,07 - 0,13	0,07 - 0,15	0,08 - 0,16	0,10 - 0,18	0,12 - 0,22	0,08 - 0,16	0,10 - 0,18
N	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 180	0,04 - 0,13	0,07 - 0,15	0,08 - 0,16	0,10 - 0,25	0,12 - 0,26	0,08 - 0,16	0,10 - 0,25
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100 - 170	0,04 - 0,13	0,07 - 0,15	0,08 - 0,16	0,10 - 0,25	0,12 - 0,26	0,08 - 0,16	0,10 - 0,25
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	180 - 280	0,04 - 0,06	0,07 - 0,12	0,08 - 0,13	0,09 - 0,15	0,12 - 0,20	0,08 - 0,13	0,09 - 0,15
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 280	0,04 - 0,06	0,07 - 0,12	0,08 - 0,13	0,09 - 0,15	0,12 - 0,20	0,08 - 0,13	0,09 - 0,15
N	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	180 - 280	0,04 - 0,06	0,07 - 0,12	0,08 - 0,13	0,09 - 0,15	0,12 - 0,20	0,08 - 0,13	0,09 - 0,15
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 270	0,04 - 0,06	0,07 - 0,12	0,08 - 0,13	0,09 - 0,15	0,12 - 0,20	0,08 - 0,13	0,09 - 0,15
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	150 - 270	0,04 - 0,06	0,07 - 0,12	0,08 - 0,13	0,09 - 0,15	0,12 - 0,20	0,08 - 0,13	0,09 - 0,15
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 270	0,04 - 0,06	0,07 - 0,12	0,08 - 0,13	0,09 - 0,15	0,12 - 0,20	0,08 - 0,13	0,09 - 0,15

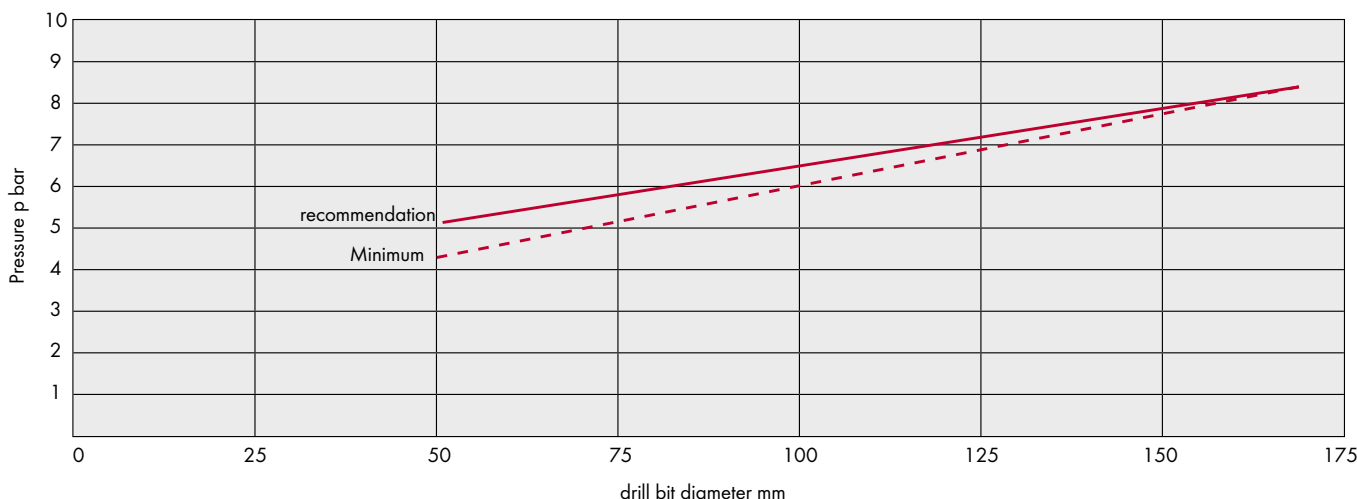


Power requirement

This diagram is based on machining experience of steels with a hardness of 200-250 HB and a cutting speed of 100 m/min



Coolant recommendation


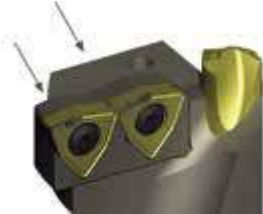
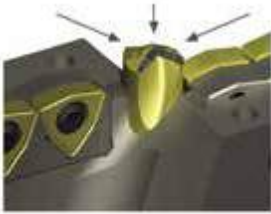






Incorrect	Correct	Description
		<p>No spot drilling is necessary on flat surfaces. For centring holes, the centring drill bit must be smaller than the pilot drill bit.</p>
		<p>Boring into an inclined surface is possible up to an 8° incline. Boring through an inclined surface is possible up to a 4° incline. For greater inclines, the incline and/or uneven surface must be face milled in advance.</p>
		<p>VORTEX drill bits are not recommended for drilling. Use Integrex drill bits for large diameters. Use solid carbide drill bits for small diameters. The solid carbide drill bit is centred using the centring hole of the pilot drill bit.</p>
		<p>VORTEX drill bits are not recommended. Note: Material residues are generated when boring through-holes. With a fixed drill bit and rotating workpiece, the centrifugal force can cause these material residues to fly out uncontrolled from the chuck. Use enclosed machines and wear adequate occupational safety equipment.</p>

**palbit**  **Problem solving VORTEX DRILL**

- **Note:** When drilling through-holes, a disc is created when the drill bit exits. With a fixed drill bit and rotating workpiece, these can be forced out. Protect the operator and personnel with adequate occupational safety equipment. When the drill bit exits the material, a small recess is created as the pilot drill bit is no longer in the cut.

Problem	Corrective measure
<p><b>Nicks on the pilot drill bit</b></p> 	<p>Use on lathes:</p> <ul style="list-style-type: none"> <li>• Check tool centring, realign machine if necessary</li> <li>• Check and/or improve workpiece and tool clamping</li> </ul>
<p><b>Nicks on the indexable cutting insert</b></p> 	<ul style="list-style-type: none"> <li>• Use tougher model</li> <li>• Reduce feed by 20 %</li> <li>• Check and/or improve workpiece and tool clamping</li> </ul>
<p><b>Excessive pilot drill bit wear</b></p> 	<ul style="list-style-type: none"> <li>• Use coated pilot drill bit</li> <li>• Increase pressure and flow of coolant</li> <li>• Reduce cutting speed by 20 %</li> <li>• Choose a more wear-resistant model</li> </ul>
<p><b>Sub-optimal chip breaking</b></p> 	<ul style="list-style-type: none"> <li>• Increase cutting speed by 20 % and reduce feed by 20 %</li> </ul>
<p><b>Sub-optimal chip removal, poor bore quality</b></p> 	<ul style="list-style-type: none"> <li>• Increase pressure and volume of coolant for better chip removal</li> <li>• Increase speed by up to 20 %</li> </ul>



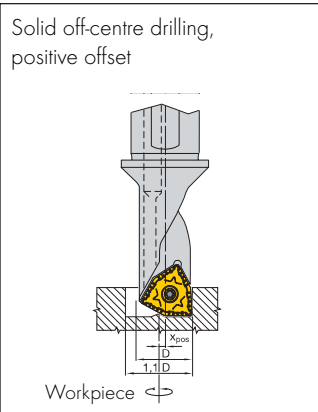
# ATORN® Universal Drilling and Turning Tool



• Please adjust these guideline values according to clamping operation and machine set-up!

129501.... 129511....  
129502.... 129512....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min		
					HC7625	HC7535	HW7310
P	Machining steel	up to 700	9 SMn 28	1.0715	170 - 300	120 - 150	
	Unalloyed structural steel	up to 700	St-52	1.0052	150 - 255	100 - 200	
	Structural steel	700 - 950	Ck45	1.1191	100 - 200	70 - 180	
	Tempering steel	500 - 950	42 CrMo4	1.7225	90 - 160	50 - 150	
	Case-hardened steel	up to 1200	16 MnCr 5	1.7131	90 - 145	70 - 150	
	Tempering steel	950 - 1300	43CrMo4	1.3563	80 - 140	50 - 120	
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	90 - 145	70 - 150	
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	80 - 140	50 - 120	
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	110 - 200	70 - 150	
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	90 - 160	50 - 150	
K	Grey cast iron	up to 260 HB	GG 25	0.6025			150 - 250
	Alloyed grey cast iron	up to 310 HB	GGLNiCr 35 2	0.6678			100 - 150
	Ductile iron	up to 280 HB	GGG 60	0.7060			80 - 150
	Malleable cast iron	up to 280 HB	GTS 55	0.8155			100 - 180
N	Al. alloys, long-chipping	up to 500	AlMg 3	3.3535			320 - 2000
	Al. alloys, short-chipping	up to 500	G-AlSi 12	3.2581			160 - 1600
	Copper alloy (bronze), long-chipping	up to 1200	CuSn4	2.1016			120 - 320
	Copper alloy (bronze), short-chipping	up to 850	CuNi12Zn24	2.0730			120 - 520
	Copper alloy (brass), long-chipping	up to 600	Cu ZN 20	2.0250			200 - 520
	Copper alloy (brass), short-chipping	up to 600	Cu Zn 39 Pb 3	2.0381			200 - 800



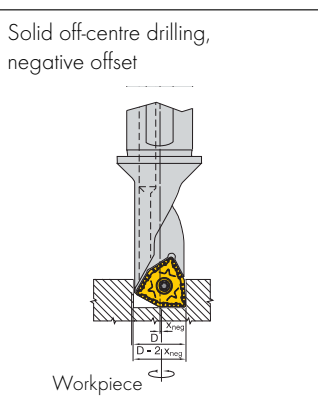
$X_{pos}$  : positive offset from the centre

D: tool nominal diameter

D	Steel		Aluminium	
	D max.	$X_{pos}$	D max.	$X_{pos}$
08H13	8.8	0.40	12.0	2.00
10H13	11.0	0.50	15.0	2.50
11H13	12.1	0.55	16.5	2.75
15H13	16.5	0.75	22.5	3.75
18H13	19.8	0.90	27.0	4.50
20H13	22.0	1.00	30.0	5.00
26H13	28.6	1.30	39.0	6.50

$$\text{Steel } X_{pos} = \frac{(1.1 \times D) - D}{2}$$

$$\text{Aluminium } X_{pos} = \frac{(1.5 \times D) - D}{2}$$

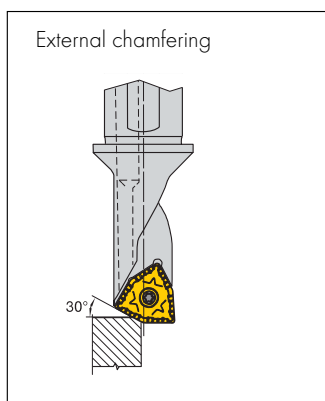
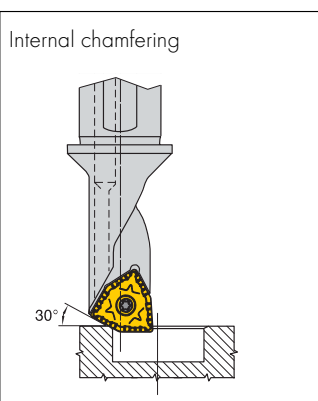


$X_{neg}$  : negative offset from the centre

D: tool nominal diameter

D	D min.	$X_{neg}$
08H13	7.8	0.10
10H13	9.8	0.10
11H13	10.8	0.10
15H13	14.7	0.15
18H13	17.7	0.15
20H13	19.7	0.15
26H13	25.7	0.15

$$X_{neg} = \frac{(D \text{ min.}) - D}{2}$$

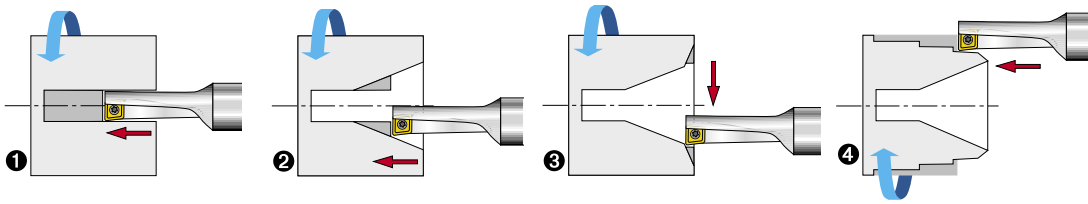


## SARA® SARAcut 2.0 Drilling and turning tool



129101.... 129102....  
129201.... 129202....

- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min		Feed f in mm/rev in relation to drill bit diameter in mm			
					SP 300	SP 350	8 - 10 - 12	14 - 16	18 - 20	25 - 32
P	Unalloyed structural steel	Up to 700	St-52	1.0052	50 - 230	70 - 250	0.02 - 0.04	0.03 - 0.05	0.03 - 0.06	0.04 - 0.1
	Tempering steel	500 - 950	42 CrMo4	1.7225	50 - 160	60 - 180	0.02 - 0.04	0.03 - 0.05	0.03 - 0.06	0.04 - 0.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	50 - 150	50 - 160	0.02 - 0.04	0.03 - 0.05	0.03 - 0.06	0.04 - 0.1
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	50 - 180	70 - 180	0.02 - 0.04	0.02 - 0.05	0.02 - 0.06	0.03 - 0.08
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	50 - 160	90 - 180	0.02 - 0.04	0.02 - 0.05	0.02 - 0.06	0.03 - 0.08
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	90 - 180	90 - 230	0.02 - 0.06	0.04 - 0.08	0.05 - 0.08	0.04 - 0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	90 - 180	110 - 230	0.02 - 0.06	0.04 - 0.08	0.05 - 0.08	0.04 - 0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	60-140	90 - 230	0.02 - 0.06	0.04 - 0.08	0.05 - 0.08	0.04 - 0.12
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	70 - 1350	70 - 1350	0.05 - 0.1	0.06 - 0.1	0.06 - 0.12	0.05 - 0.25
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	70 - 1500	70 - 1500	0.05 - 0.1	0.06 - 0.1	0.06 - 0.12	0.05 - 0.25
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	70 - 360	70 - 360	0.05 - 0.1	0.06 - 0.1	0.06 - 0.12	0.05 - 0.25
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	70 - 360	70 - 360	0.05 - 0.1	0.06 - 0.1	0.06 - 0.12	0.05 - 0.25
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 90	30 - 110	0.02 - 0.04	0.02 - 0.05	0.02 - 0.06	0.03 - 0.08
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 80	10 - 50	0.02 - 0.04	0.02 - 0.05	0.02 - 0.06	0.03 - 0.08

## Taps and thread formers

- Please adjust these guideline values according to clamping operation and machine set-up!
- Vc formers = Vc + 30-50%
- \*Solid carbide taps

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min		Coolant
					Blank	Coated	
P	Machining steel	Up to 700	9 SMn 28	1.0715	10-15	15 - 25	Emulsion, cutting oil
	Unalloyed structural steel	Up to 700	St-52	1.0052	10-15	15 - 25	Emulsion, cutting oil
	Structural steel	700 - 950	Ck45	1.1191	10-15	15 - 25	Emulsion, cutting oil
	Tempering steel	500 - 950	42 CrMo4	1.7225	2-5	5 - 10	Emulsion, cutting oil
	Cast steel	Up to 950	GS 40	1.0416	10-15	15 - 25	Emulsion, cutting oil
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	10-15	15 - 25	Emulsion, cutting oil
	Tempering steel	950 - 1300	43CrMo4	1.3563	2-5	5 - 10	Emulsion, cutting oil
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	3 - 5	5 - 8	Emulsion, cutting oil
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	8 - 10	10-15	Emulsion, cutting oil
	M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	3 - 5	5 - 8
Stainless steel, austenitic		500 - 950	X 5 CrNi 18 10	1.4301	3 - 5	5 - 8	Emulsion
Duplex		700 - 950	x 2 CrNiMoN 22-5-3	1.4462	3 - 5	5 - 8	Emulsion
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	8 - 12	12 - 20	Emulsion, dry
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	5 - 8	10 - 20	Emulsion, cutting oil
	Ductile iron	Up to 280 HB	GGG 60	0.7060	5 - 8	10 - 20	Emulsion, cutting oil
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	10-15	15-20	Emulsion, cutting oil
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	20 - 25	25 - 35	Emulsion, cutting oil
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	20 - 30	30 - 40	Emulsion, cutting oil
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	10-15	15-20	Emulsion, cutting oil
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	10-15	15-20	Emulsion, cutting oil
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	20 - 25	25 - 35	Emulsion, cutting oil
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	20 - 25	25 - 35	Emulsion, cutting oil
	Thermoplastic		PVC		20 - 30	30 - 40	Cutting oil
	Thermoset		Melamine		3 - 5	5 - 8	Dry
	Fibre-reinforced plastics		CFRP, GFRP		2 - 4	4 - 6	Dry
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	2 - 4	4 - 6	Cutting oil
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	2 - 4	4 - 6	Cutting oil
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	2 - 4	4 - 6	Cutting oil
H	Hardened materials up to 55 HRC		X40Cr14	1.2083		1 - 3 (2 - 12)*	Cutting oil
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379		2 - 6*	Cutting oil
	Hardened materials up to 64 HRC		100Cr6	1.2067		1 - 3*	Cutting oil

## Repair of damaged or worn thread

### Application

- Thread repair of damage or worn thread
- Thread reinforcement of materials with low shear strength, e.g. aluminium and magnesium alloys
- In mechanical, automotive, electrical and medical engineering

### 1 Drilling

Bore out damaged thread with twist drill bit.

### 2 Inspection

Inspect thread and threaded bolt for even thread and pitch.

### 3 Thread

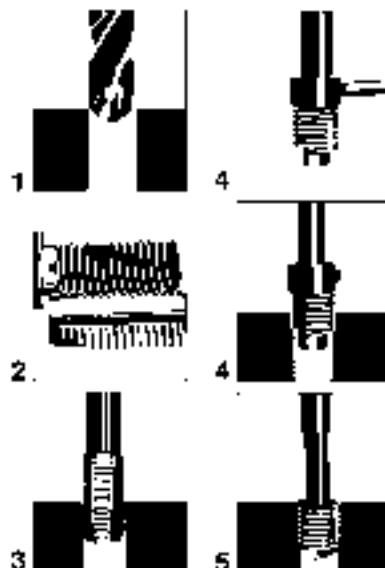
Cut the holding thread into the bored-out hole using a special coil tap. The use of cutting oil is advisable.

### 4 Install thread insert

Place the insert on the tool and ensure the tang sits in the keyway opening. Correctly adjust using the adjusting ring. Gently screw-in the thread insert in the rotation direction. Do not turn against the running direction; the tang may break.

### 5 Break-off tang

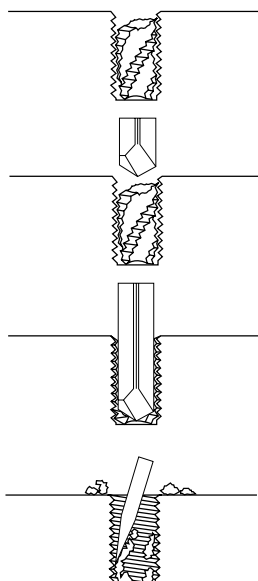
After installation, remove the screwing tool and remove the tang using the tang breaker.



## Solid carbide extractors for extracting damaged taps

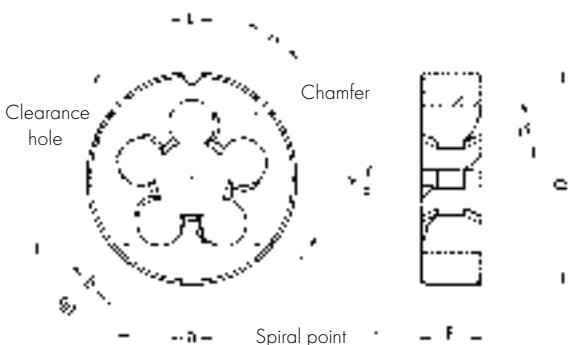
### Cutting data and comments

- $V_c = \text{ca. } 20\text{-}25 \text{ m/min.}$
- $f = \text{ca. } 0.01\text{-}0.05 \text{ mm/rev}$
- Please ensure stable clamping!
- Please use high-quality lubricant!
- This tool should not be used to machine soft steels, aluminium alloys or other soft materials.
- The tool should be sharpened from time to time.



1. Position the drill bit on the centre of the damaged tap; please ensure that the workpiece and drill bit are securely clamped. If the head of the damaged tap protrudes from the workpiece, smooth the damaged surface to allow easier boring of the centre of the tap.
2. Perform initial centring at a low feed rate. Then retract the drill bit. Please use a little lubricant for this step.
3. Select the corresponding drill bit. Bore the hole with firm feed/speed. Pause the operation occasionally to remove chips. Please use lubricant of a sufficiently high quality.
4. If the bore is clean, the remaining tap can be easily removed using a scribe or a similar pointed tool; the thread cutting can then be continued.

## Definitions and dimension explanations for threading dies



- D External diameter (n. DIN, tolerance f10)
- E Width
- a Tooth width
- c Groove width
- b Diameter of the bore for retaining screw
- $\alpha$  Rake angle
- $\beta$  Chamfer angle, half countersink angle
- $\gamma$  Spiral point angle

### Threading die tolerances

We supply threading dies for the tolerance class "medium" as standard. Threading dies for other tolerance classes are available on request.

# Tapping holes for taps

• Please adjust these guideline values according to clamping operation and machine set-up!

## M Metric ISO standard thread / DIN 13

M	Pitch	Borehole mm
M 1	0,25	0,75
M 1,1	0,25	0,85
M 1,2	0,25	0,95
M 1,4	0,30	1,1
M 1,6	0,35	1,25
M 1,8	0,35	1,45
M 2	0,40	1,6
M 2,2	0,45	1,75
M 2,5	0,45	2,05
M 3	0,50	2,5
M 3,5	0,60	2,9
M 4	0,70	3,3
M 4,5	0,75	3,7
M 5	0,80	4,2
M 6	1,00	5
M 7	1,00	6
M 8	1,25	6,8
M 9	1,25	7,8
M 10	1,50	8,5
M 11	1,50	9,5
M 12	1,75	10,2
M 14	2,00	12
M 16	2,00	14
M 18	2,50	15,5
M 20	2,50	17,5
M 22	2,50	19,5
M 24	3,00	21
M 27	3,00	24
M 30	3,50	26,5
M 33	3,50	29,5
M 36	4,00	32
M 39	4,00	35
M 42	4,50	37,5
M 45	4,50	40,5
M 48	5,00	43
M 52	5,00	47
M 56	5,50	50,5
M 60	5,50	54,5
M 64	6,00	58
M 68	6,00	62

## Rp Whitworth pipe thread DIN 2999

Rp	Number of threads to 1 inch	Borehole mm
Rp 1/8"	28	8,60
Rp 1/4"	19	11,50
Rp 3/8"	19	15,00
Rp 1/2"	14	18,50
Rp 3/4"	14	24,00
Rp 1"	11	30,25
Rp 1.1/4"	11	39,00
Rp 1.1/2"	11	44,85
Rp 2"	11	56,50

## BSW British Standard Whitworth / BS 84

BSW	Number of threads to 1 inch	Borehole mm
1/4"	20	5,10
5/6"	18	6,50
3/8"	16	7,90
7/16"	14	9,20
1/2"	12	10,50
5/8"	11	13,50
3/4"	10	16,30
7/8"	9	19,25
1"	8	22,00
1.1/8"	7	24,75
1.1/4"	7	27,75
1.3/8"	6	30,20
1.1/2"	6	33,50
1.5/8"	5	35,50
1.3/4"	5	38,50
1.7/8"	4,5	41,50
2"	4,5	44,50
2.1/4"	4	50,00
2.1/2"	4	56,50
2.3/4"	3,5	62,00
3"	3,5	68,00

## MF ISO fine-pitch metric thread / DIN 13

MF	Pitch	Borehole mm
M 2	0,25	1,75
M 2,2	0,25	1,95
M 2,5	0,35	2,15
M 3	0,35	2,65
M 3,5	0,35	3,15
M 4	0,5	3,50
M 5	0,5	4,50
M 6	0,5	5,50
M 6	0,75	5,20
M 8	0,75	7,20
M 10	0,75	9,20
M 12	0,75	11,20
M 8	1,00	7,00
M 10	1,00	9,00
M 12	1,00	11,00
M 14	1,00	13,00
M 16	1,00	15,00
M 18	1,00	17,00
M 20	1,00	19,00
M 22	1,00	21,00
M 24	1,00	23,00
M 26	1,00	25,00
M 28	1,00	27,00
M 30	1,00	29,00
M 10	1,25	8,80
M 12	1,25	10,80
M 14	1,25	12,80
M 12	1,50	10,50
M 14	1,50	12,50
M 16	1,50	14,50
M 18	1,50	16,50
M 20	1,50	18,50
M 22	1,50	20,50
M 24	1,50	22,50
M 26	1,50	24,50
M 27	1,50	25,50
M 28	1,50	26,50
M 30	1,50	28,50
M 32	1,50	30,50
M 33	1,50	31,50
M 36	1,50	34,50
M 38	1,50	36,50
M 40	1,50	38,50
M 42	1,50	40,50
M 45	1,50	43,50
M 48	1,50	46,50
M 50	1,50	48,50
M 52	1,50	50,50
M 18	2,00	16,00
M 20	2,00	18,00
M 22	2,00	20,00
M 24	2,00	22,00
M 27	2,00	25,00
M 28	2,00	26,00
M 30	2,00	28,00
M 32	2,00	30,00
M 33	2,00	31,00
M 36	2,00	34,00
M 39	2,00	37,00
M 40	2,00	38,00
M 42	2,00	40,00
M 45	2,00	43,00
M 48	2,00	46,00
M 50	2,00	48,00

## UN American thread 8 and 12 Gg ANSI B 1.1

UN	Number of threads to 1 inch	Borehole mm
1.1/8"	8	25,50
1.1/4"	8	28,50
1.3/8"	8	31,75
1.1/2"	8	35,00
1.5/8"	8	38,00
1.3/4"	8	41,28
1.7/8"	8	44,50
2"	8	47,62
1.3/4"	12	42,50
2"	12	48,75

## UNC American thread ANSI B 1.1

UNC	Number of threads to 1 inch	Borehole mm
Nr. 1	64	1,50
Nr. 2	56	1,80
Nr. 3	48	2,10
Nr. 4	40	2,30
Nr. 5	40	2,60
Nr. 6	32	2,80
Nr. 8	32	3,50
Nr. 10	24	3,90
Nr. 12	24	4,50
1/4"	20	5,20
5/16"	18	6,60
3/8"	16	8,00
7/16"	14	9,40
1/2"	13	10,80
9/16"	12	12,20
5/8"	11	13,60
3/4"	10	16,50
7/8"	9	19,50
1"	8	22,25
1.1/8"	7	25,00
1.1/4"	7	28,18
1.3/8"	6	30,75
1.1/2"	6	34,00
1.3/4"	5	39,50
2"	4,5	45,00
2.1/4"	4,5	51,50
2.1/2"	4	57,00
2.3/4"	4	63,50
3"	4	70,00

## UNF American thread ANSI B 1.1

UNF	Number of threads to 1 inch	Borehole mm
Nr. 0	80	1,25
Nr. 1	72	1,55
Nr. 2	64	1,90
Nr. 3	56	2,10
Nr. 4	48	2,40
Nr. 5	44	2,70
Nr. 6	40	2,95
Nr. 8	36	3,50
Nr. 10	32	4,10
Nr. 12	28	4,70
1/4"	28	5,50
5/16"	24	6,90
3/8"	24	8,50
7/16"	20	9,90
1/2"	20	11,50
9/16"	18	12,90
5/8"	18	14,50
3/4"	16	17,50
7/8"	14	20,40
1"	12	23,25
1.1/8"	12	26,50
1.1/4"	12	29,50
1.3/8"	12	32,75
1.1/2"	12	36,00

## UNEF American thread ANSI B 1.1

UNEF	Number of threads to 1 inch	Borehole mm
Nr. 12	32	4,75
1/4"	32	5,60
5/16"	32	7,20
3/8"	32	8,80
7/16"	28	10,30
1/2"	28	11,80
9/16"	24	13,30
5/8"	24	14,90
11/16"	24	16,50
3/4"	20	17,75
13/16"	20	19,40
7/8"	20	21,00
15/16"	20	22,50
1"	20	24,25
1.1/16"	18	25,50
1.1/8"	18	27,25
1.1/4"	18	30,40
1.5/16"	18	32,00
1.3/8"	18	33,50
1.1/2"	18	36,75

## EG - M Metric ISO standard thread

EG - M	Pitch	Borehole mm
EG - M 2	0,40	2,10
EG - M 2,5	0,45	2,60
EG - M 3	0,50	3,20
EG - M 3,5	0,60	3,70
EG - M 4	0,70	4,20
EG - M 5	0,80	5,20
EG - M 6	1	6,30
EG - M 8	1,25	8,40
EG - M 10	1,50	10,40
EG - M 12	1,75	12,50
EG - M 14	2,00	14,50
EG - M 16	2,00	16,50
EG - M 18	2,50	18,75
EG - M 20	2,50	20,75
EG - M 22	2,50	22,75
EG - M 24	3,00	24,75
EG - M 30	3,50	31,00

## EG - MF ISO fine-pitch metric thread

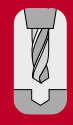
EG - MF	Pitch	Borehole mm
EG - M 8	1	8,30
EG - M 10	1	10,30
EG - M 10	1,25	10,30
EG - M 12	1,25	12,30
EG - M 12	1,50	12,50
EG - M 14	1,25	14,30
EG - M 14	1,50	14,50
EG - M 16	1,50	16,50
EG - M 18	1,50	18,50
EG - M 20	1,50	20,50
EG - M 22	1,50	22,50
EG - M 24	1,50	24,50

## EG - UNC American thread ANSI B 1.1

EG - UNC	Number of threads to 1 inch	Borehole mm
Nr. 1	64	2,00
Nr. 2	56	2,40
Nr. 3	48	2,80
Nr. 4	40	3,10
Nr. 5	40	3,40
Nr. 6	32	3,80
Nr. 8	32	4,50
Nr. 10	24	5,30
Nr. 12	24	5,90
1/4"	20	6,80
5/16"	18	8,40
3/8"	16	10,00
7/16"	14	11,75
1/2"	13	13,30
9/16"	12	15,00
5/8"	11	16,50
3/4"	10	19,75
7/8"	9	23,00
1"	8	26,50

## EG - UNF American thread ANSI B 1.1

EG-UNF	Number of threads to 1 inch	Borehole mm
Nr. 0	80	1,60
Nr. 1	72	2,00
Nr. 2	64	2,40
Nr. 3	56	2,70
Nr. 4	48	3,10
Nr. 5	44	3,40
Nr. 6	40	3,80
Nr. 8	36	4,40
Nr. 10	32	5,10
Nr. 12	28	5,80
1/4"	28	6,60
5/16"	24	8,30
3/8"	24	9,80
7/16"	20	11,50
1/2"	20	13,10
9/16"	18	14,75
5/8"	18	16,27
3/4"	16	19,50
7/8"	14	22,75
1"	12	26,00



BSPT / Rc thread ISO 7 / 1 - Konizität 1:16				
BSPT	Number of threads to 1 inch	D Straight mm	D kon. mm	Bore length
Rc 1/8"	28	8,30	8,50	10,20
Rc 1/4"	19	11,10	11,35	15,70
Rc 3/8"	19	14,50	14,85	16,00
Rc 1/2"	14	18,10	18,50	21,50
Rc 3/4"	14	23,50	24,00	22,80
Rc 1"	11	29,75	30,15	27,30
Rc 1.1/4"	11	38,20	38,80	30,00
Rc 1.1/2"	11	44,00	44,70	30,00
Rc 2"	11	55,56	56,50	34,00

NPT / NPTF thread ANSI B 2.1 - Konizität 1:16				
NPT / NPTF	Number of threads to 1 inch	D Straight mm	D kon. mm	Bore length
1/16"	27	6,25	6,40	12,10
1/8"	27	8,40	8,70	12,10
1/4"	18	11,10	11,40	17,50
3/8"	18	14,30	14,80	17,70
1/2"	14	17,90	18,30	23,00
3/4"	14	23,00	23,70	23,00
1"	11,5	29,00	29,70	27,40
1.1/4"	11,5	37,70	38,40	28,00
1.1/2"	11,5	44,00	44,50	28,40
2"	11,5	56,00	56,60	28,40

G - R pipe thread / DIN ISO 228		
G	Number of threads to 1 inch	Borehole mm
G 1/8"	28	8,70
G 1/4"	19	11,80
G 3/8"	19	15,25
G 1/2"	14	19,00
G 5/8"	14	21,00
G 3/4"	14	24,50
G 7/8"	14	28,25
G 1"	11	30,75
G 1.1/8"	11	35,50
G 1.1/4"	11	39,50
R <sup>*</sup> 1.3/8"	11	41,67
G 1.1/2"	11	45,24
G 1.3/4"	11	51,00
G 2"	11	57,00
G 2.1/4"	11	63,10
G 2.1/2"	11	72,50
G 2.3/4"	11	79,00
G 3"	11	85,20
R <sup>*</sup> 3.1/4"	11	91,50
G 3.1/2"	11	97,80
R 3.3/4"	11	104,00
G 4"	11	110,50

\*not included in DIN ISO 228

Tr metric ISO trapezoidal thread DIN 103/7H		
Tr	Pitch	Borehole mm
Tr 10	2	8,10
Tr 12	3	9,20
Tr 14	3	11,20
Tr 14	4	10,50
Tr 16	4	12,25
Tr 18	4	14,25
Tr 20	4	16,25
Tr 22	5	17,25
Tr 24	5	19,25
Tr 28	5	23,25
Tr 30	6	24,25
Tr 32	6	26,25
Tr 36	6	30,25
Tr 38	7	31,25

## Tapping holes for taps

- Please adjust these guideline values according to clamping operation and machine set-up!

M Metric ISO standard thread / DIN 13		
M	Pitch	Borehole mm
M 1,6	0,35	1,45 ± 0,02
M 2	0,40	1,80 ± 0,02
M 2,5	0,45	2,30 ± 0,02
M 3	0,50	2,75 ± 0,03
M 3,5	0,60	3,20 ± 0,03
M 4	0,70	3,65 ± 0,03
M 5	0,80	4,60 ± 0,03
M 6	1,00	5,55 ± 0,04
M 8	1,25	7,40 ± 0,04
M 10	1,50	9,30 ± 0,05
M 12	1,75	11,10 ± 0,05
M 14	2,00	13,10 ± 0,05
M 16	2,00	15,10 ± 0,05
M 18	2,50	16,90 ± 0,05
M 20	2,50	18,90 ± 0,05
M 22	2,50	20,90 ± 0,05
M 24	3,00	22,65 ± 0,05
M 27	3,00	25,65 ± 0,05

MF ISO fine-pitch metric thread / DIN 13		
MF	Pitch	Borehole mm
M 4	0,50	3,75 ± 0,03
M 5	0,50	4,75 ± 0,03
M 6	0,50	5,75 ± 0,03
M 6	0,75	5,65 ± 0,03
M 8	1,00	7,55 ± 0,04
M 10	1,00	9,55 ± 0,04
M 12	1,00	11,55 ± 0,04
M 14	1,00	13,55 ± 0,04
M 16	1,00	15,55 ± 0,04
M 10	1,25	9,40 ± 0,04
M 12	1,25	11,40 ± 0,04
M 14	1,25	13,40 ± 0,04
M 16	1,25	15,40 ± 0,04
M 12	1,50	11,30 ± 0,05
M 14	1,50	13,30 ± 0,05
M 16	1,50	15,30 ± 0,05
M 18	1,50	17,30 ± 0,05
M 20	1,50	19,30 ± 0,05
M 20	2,00	19,10 ± 0,05
M 22	2,00	21,10 ± 0,05
M 24	2,00	23,10 ± 0,05

G - R pipe thread / DIN ISO 228		
G	Number of threads to 1 inch	Borehole mm
G 1/8"	28	9,25 ± 0,04
G 1/4"	19	12,40 ± 0,04
G 3/8"	19	16,00 ± 0,04
G 1/2"	14	20,00 ± 0,05
G 5/8"	14	22,00 ± 0,05
G 3/4"	14	25,40 ± 0,05
G 7/8"	14	29,25 ± 0,05

UNC American thread ANSI B 1.1		
UNC	Number of threads to 1 inch	Borehole mm
Nr. 2	56	2,00 ± 0,02
Nr. 3	48	2,30 ± 0,03
Nr. 4	40	2,55 ± 0,03
Nr. 5	40	2,90 ± 0,03
Nr. 6	32	3,15 ± 0,03
Nr. 8	32	3,80 ± 0,03
Nr. 10	24	4,35 ± 0,03
1/4"	20	5,80 ± 0,04
5/16"	18	7,30 ± 0,05
3/8"	16	8,80 ± 0,05
7/16"	14	10,30 ± 0,05
1/2"	13	11,80 ± 0,05
9/16"	12	13,35 ± 0,05
5/8"	11	14,85 ± 0,05
3/4"	10	17,90 ± 0,05

UNF American thread ANSI B 1.1		
UNF	Number of threads to 1 inch	Borehole mm
Nr. 2	64	2,00 ± 0,02
Nr. 3	56	2,30 ± 0,02
Nr. 4	48	2,60 ± 0,03
Nr. 5	44	2,90 ± 0,03
Nr. 6	40	3,20 ± 0,03
Nr. 8	36	3,85 ± 0,03
Nr. 10	32	4,45 ± 0,03
Nr. 12	28	5,10 ± 0,03
1/4"	28	5,90 ± 0,04
5/16"	24	7,45 ± 0,04
3/8"	24	9,00 ± 0,04
7/16"	20	10,55 ± 0,04
1/2"	20	12,10 ± 0,04
9/16"	18	13,65 ± 0,05
5/8"	18	15,25 ± 0,05
3/4"	16	18,35 ± 0,05
7/8"	14	21,43 ± 0,05
1"	12	24,45 ± 0,05

EG - M Metric ISO standard thread		
EG - M	Pitch	Borehole mm
EG - M 2	0,40	2,35 ± 0,02
EG - M 2,5	0,45	2,90 ± 0,02
EG - M 3	0,50	3,45 ± 0,03
EG - M 3,5	0,60	4,00 ± 0,03
EG - M 4	0,70	4,60 ± 0,03
EG - M 5	0,80	5,70 ± 0,03
EG - M 6	1,00	6,85 ± 0,04
EG - M 8	1,25	9,05 ± 0,04
EG - M 10	1,50	11,25 ± 0,05
EG - M 12	1,75	13,50 ± 0,05
EG - M 14	2,00	15,70 ± 0,05
EG - M 16	2,00	17,70 ± 0,05
EG - M 18	2,50	20,10 ± 0,05
EG - M 20	2,50	22,10 ± 0,05
EG - M 22	2,50	24,10 ± 0,05
EG - M 24	3,00	26,50 ± 0,05

EG - MF ISO fine-pitch metric thread		
EG - MF	Pitch	Borehole mm
EG - M 8	1,00	8,85 ± 0,04
EG - M 10	1,00	10,85 ± 0,04
EG - M 12	1,00	12,85 ± 0,04
EG - M 14	1,00	14,85 ± 0,04
EG - M 10,25	1,25	11,05 ± 0,04
EG - M 12	1,25	13,05 ± 0,04
EG - M 14	1,25	15,05 ± 0,04
EG - M 12	1,50	13,25 ± 0,05
EG - M 14	1,50	15,25 ± 0,05
EG - M 16	1,50	17,25 ± 0,05
EG - M 18	1,50	19,25 ± 0,05
EG - M 20	1,50	21,25 ± 0,05
EG - M 20	2,00	21,70 ± 0,05
EG - M 22	2,00	23,75 ± 0,05
EG - M 24	2,00	25,75 ± 0,05

EG - UNC American thread ANSI B 1.1		
EG - UNC	Number of threads to 1 inch	Borehole mm
Nr. 2	56	2,70 ± 0,02
Nr. 3	48	3,00 ± 0,03
Nr. 4	40	3,35 ± 0,03
Nr. 5	40	3,70 ± 0,03
Nr. 6	32	4,20 ± 0,03
Nr. 8	32	4,85 ± 0,03
Nr. 10	24	5,70 ± 0,03
1/4"	20	7,45 ± 0,04
5/16"	18	9,10 ± 0,05
3/8"	16	10,80 ± 0,05
7/16"	14	12,65 ± 0,05
1/2"	13	14,30 ± 0,05
9/16"	12	16,10 ± 0,05
5/8"	11	17,86 ± 0,05
3/4"	10	21,20 ± 0,05

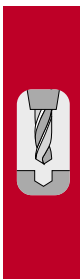
EG - UNF American thread ANSI B 1.1		
EG - UNF	Number of threads to 1 inch	Borehole mm
Nr. 2	64	2,50 ± 0,02
Nr. 3	56	2,90 ± 0,02
Nr. 4	48	3,30 ± 0,03
Nr. 5	44	3,65 ± 0,03
Nr. 6	40	4,00 ± 0,03
Nr. 8	36	4,75 ± 0,03
Nr. 10	32	5,50 ± 0,03
Nr. 12	28	6,25 ± 0,03
1/4"	28	7,05 ± 0,04
5/16"	24	8,80 ± 0,04
3/8"	24	10,40 ± 0,04
7/16"	20	12,20 ± 0,04
1/2"	20	13,75 ± 0,04
9/16"	18	15,50 ± 0,05
5/8"	18	17,07 ± 0,05
3/4"	16	20,40 ± 0,05
7/8"	14	23,75 ± 0,05
1"	12	27,20 ± 0,05

## Core diameter-tolerance field for thread forming in accordance with DIN 13, Part 50

For strength reasons it is not necessary to maintain the core diameter tolerances of tolerance class 6H; tolerance class 7H satisfies the demand that the flank coverage of bolt and nut thread  $0.32 \times P$  should not be exceeded. Formed threads are normally stronger than cut threads due to the uninterrupted fibre orientation and the work hardening.

M Metric ISO standard thread				
M	Pitch mm	Hole Ø mm	Core Ø 7H nut thread	
			min.	max.
M1	0.25	0.88	-	-
M1.1	0.25	0.98	-	-
M1.2	0.25	1.08	-	-
M1.4	0.30	1.25	-	-
M1.6	0.35	1.45	-	-
M1.7	0.35	1.55	-	-
M1.8	0.35	1.65	-	-
M2.0	0.40	1.80	-	-
M2.2	0.45	2.00	-	-
M2.3	0.40	2.10	-	-
M2.5	0.45	2.30	-	-
M2.6	0.45	2.40	-	-
M3.0	0.50	2.80	2.459	2.639
M3.5	0.60	3.25	2.850	3.050
M4.0	0.70	3.70	3.242	3.466
M4.5	0.75	4.15	3.688	3.924
M5.0	0.80	4.65	4.134	4.384
M6.0	1.00	5.55	4.917	5.217
M7.0	1.00	6.55	5.917	6.217
M8.0	1.25	7.40	6.647	6.982
M9.0	1.25	8.40	7.647	7.982
M10	1.50	9.25	8.376	8.751
M11	1.50	10.25	9.376	9.751
M12	1.75	11.20	10.106	10.531
M14	2.00	13.10	11.835	12.310
M16	2.00	15.10	13.835	14.310
M18	2.50	16.90	15.294	15.854
M20	2.50	18.90	17.294	17.854

MF Metric ISO fine thread				
MF	Pitch mm	Hole Ø mm	Core Ø 7H nut thread	
			min.	max.
M5	0.50	4.75	4.459	4.639
M5.5	0.50	5.25	4.959	5.139
M6	0.75	5.65	5.188	5.424
M7	0.75	6.65	6.188	6.424
M8	0.75	7.65	7.188	7.424
M8	1.00	7.55	6.917	7.217
M9	0.75	8.65	8.188	8.424
M9	1.00	8.55	7.917	8.217
M10	0.75	9.65	9.188	9.424
M10	1.00	9.55	8.917	9.217
M10	1.25	9.40	8.647	8.982
M11	0.75	10.65	10.188	10.424
M11	1.00	10.55	9.917	10.217
M12	1.00	11.55	10.917	11.217
M12	1.25	11.40	10.647	10.982
M12	1.50	11.30	10.376	10.751
M14	1.00	13.55	12.917	13.217
M14	1.25	13.40	12.647	12.982
M14	1.50	13.30	12.376	12.751
M15	1.00	14.55	13.917	14.217
M15	1.50	14.30	13.376	13.751
M16	1.00	15.55	14.917	15.217
M16	1.50	15.30	14.376	14.751
M17	1.00	16.55	15.917	16.217
M17	1.50	16.30	15.376	15.751
M18	1.00	17.55	16.917	17.217
M18	1.50	17.30	16.376	16.751
M18	2.00	17.10	15.835	16.310
M20	1.00	19.55	18.917	19.217
M20	1.50	19.30	18.376	18.751
M22	1.50	21.30	20.376	20.751
M24	1.50	23.30	22.376	22.751



## THERMORILL® Thermal drill bit (flow drill)



• Please adjust these guideline values according to clamping operation and machine set-up!

102900....

FORM Without cutting edges	Thread	Short version	Material thickness max. mm	Long version	Material thickness max. mm	Shank Ø mm	Rotational speeds rpm			
							Thermal drilling			Thread forming
							Min.	Optimal	Alu, Cu	
 Additional thread in collar provides greater clamping force	M3		1.5		2.0	6	2.600	3.000	4.000	1.350
	M4		2.5		6	2.300	2.600	3.800	1.000	
	M5		2.0		6	2.200	2.500	3.700	800	
	M6		2.0		8	2.000	2.400	3.600	65	
	M8		2.5		8	1.600	2.200	3.200	500	
	M10		2.5		10	1.500	2.000	3.000	400	
	M12		3.0		12	1.400	1.800	2.800	350	
	M16		3.5		16	1.200	1.400	2.200	250	
	M18		3.5		18	1.100	1.300	2.000	230	
	M20		4.0		20	1.000	1.200	1.900	200	
	1/8"		2.5		10	1.500	2.000	3.000	400	
	1/4"		2.5		14	1.400	1.600	2.600	350	
	3/8"		2.5		16	1.200	1.400	2.200	300	
	1/2"		2.5		18	1.000	1.200	1.800	250	
	3/4"		2.5		20	900	1.000	1.600	200	
	1"		2.5		20	900	1.000	1.500	150	

CUT With cutting edges	Thread	Short version	Material thickness max. mm	Long version	Material thickness max. mm	Shank Ø mm	Rotational speeds rpm			
							Thermal drilling			Thread forming
							Min.	Optimal	Alu, Cu	
 For smooth surfaces	M3		1.5		3.0	6	2.600	3.000	4.000	1.350
	M4		4.0		6	2.300	2.600	3.800	1.000	
	M5		3.0		6	2.200	2.500	3.700	800	
	M6		3.0		8	2.000	2.400	3.600	65	
	M8		4.0		8	1.600	2.200	3.200	500	
	M10		4.0		10	1.500	2.000	3.000	400	
	M12		4.5		12	1.400	1.800	2.800	350	
	M16		5.0		16	1.200	1.400	2.200	250	
	M18		5.0		18	1.100	1.300	2.000	230	
	M20		6.0		20	1.000	1.200	1.900	200	
	1/8"		4.0		10	1.500	2.000	3.000	400	
	1/4"		4.0		14	1.400	1.600	2.600	350	
	3/8"		4.0		16	1.200	1.400	2.200	300	
	1/2"		4.0		18	1.000	1.200	1.800	250	
	3/4"		4.0		20	900	1.000	1.600	200	
	1"		4.0		20	900	1.000	1.500	150	



## HSS countersink



- Please adjust the guideline values according to clamping operation and machine set-up!

150101....	150106....	150112....	150117....	150140....	150148....	150155....
150102....	150107....	150113....	150130....	150145....	150150....	150201....
150104....	150110....	150114....	150131....	150146....	150151....	150270....
150105....	150111....	150116....	150135....	150147....	150115....	150271....

- Recommended cutting data for coated HSS, as well as HSS-E countersinks:**

- The aforementioned values can be increased by approx. 10 and 20%.

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						3 - 5	5.1 - 8	8.1 - 12	12.1 - 16	16.1 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	20 - 28	0.05 - 0.07	0.08 - 0.1	0.09 - 0.12	0.12 - 0.16	0.16 - 0.2
	Unalloyed structural steel	Up to 700	St52	1.0052	20 - 28	0.05 - 0.07	0.08 - 0.1	0.09 - 0.12	0.12 - 0.16	0.16 - 0.2
	Structural steel	700 - 950	Ck45	1.1191	10-15	0.03 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.14	0.14 - 0.18
	Cast steel	Up to 950	GS 40	1.0416	6 - 10	0.03 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.14	0.14 - 0.18
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	10-15	0.03 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.14	0.14 - 0.18
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	5 - 8	0.02 - 0.04	0.04 - 0.06	0.04 - 0.06	0.04 - 0.08	0.04 - 0.1
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	5 - 8	0.03 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.14	0.14 - 0.18
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	5 - 10	0.03 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.14	0.14 - 0.18
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	8 - 14	0.04 - 0.05	0.05 - 0.1	0.1 - 0.14	0.14 - 0.18	0.18 - 0.22
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	6 - 10	0.02 - 0.04	0.04 - 0.06	0.04 - 0.06	0.04 - 0.08	0.04 - 0.1
	Ductile iron	Up to 280 HB	GGG 60	0.7060	8 - 12	0.03 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.14	0.14 - 0.18
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	8 - 12	0.03 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.14	0.14 - 0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	40 - 80	0.08 - 0.11	0.1 - 0.14	0.12 - 0.16	0.16 - 0.22	0.2 - 0.25
	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	20 - 50	0.06 - 0.09	0.08 - 0.1	0.1 - 0.12	0.12 - 0.16	0.16 - 0.2
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	35 - 50	0.06 - 0.09	0.09 - 0.12	0.12 - 0.16	0.12 - 0.16	0.16 - 0.24
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	25 - 40	0.08 - 0.11	0.1 - 0.14	0.12 - 0.16	0.16 - 0.22	0.2 - 0.25
	Thermoplastic		PVC		20 - 40	0.05 - 0.08	0.07 - 0.1	0.09 - 0.12	0.12 - 0.16	0.16 - 0.2
	Thermoset		Melamine		10 - 20	0.04 - 0.06	0.06 - 0.09	0.08 - 0.1	0.1 - 0.12	0.12 - 0.16
	Graphite		C8000		3 - 6	Manual feed	Manual feed	Manual feed	Manual feed	Manual feed
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	5 - 8	0.02 - 0.04	0.04 - 0.06	0.04 - 0.06	0.04 - 0.08	0.04 - 0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	6 - 10	0.03 - 0.05	0.05 - 0.08	0.08 - 0.1	0.1 - 0.14	0.14 - 0.18

## ATORN® ENORMplus Taper and deburring countersinks



- Please adjust these guideline values according to clamping operation and machine set-up!

150163....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						10.4	12.4	16.5	20.5	25 / 31
P	Cast steel	Up to 950	GS 40	1.0416	8 - 14	0.04	0.05	0.07	0.1	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	6 - 12	0.03	0.03	0.04	0.05	0.06
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	8 - 11	0.03	0.06	0.08	0.1	0.12
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	10 - 17	0.06	0.08	0.1	0.12	0.15
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	5 - 10	0.04	0.05	0.06	0.08	0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	5 - 12	0.07	0.1	0.12	0.15	0.18

## SARA® Taper bridge reamers



- Please adjust these guideline values according to clamping operation and machine set-up!

160130....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						6 - 10	10 - 16	16 - 25	25 - 32	32 - 40
P	Machining steel	Up to 700	9 SMn 28	1.0715	10-15	0.1 - 0.2	0.2 - 0.3	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Unalloyed structural steel	Up to 700	St52	1.0052	10-15	0.1 - 0.2	0.2 - 0.3	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Structural steel	700 - 950	Ck45	1.1191	8 - 12	0.1 - 0.2	0.2 - 0.3	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Cast steel	Up to 950	GS 40	1.0416	6 - 10	0.1 - 0.15	0.2 - 0.3	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	6 - 10	0.1 - 0.2	0.2 - 0.3	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Grey cast iron	Up to 260 HB	GG 25	0.6025	10-15	0.1 - 0.15	0.2 - 0.3	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
K	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	10 - 12	0.1 - 0.15	0.2 - 0.3	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Ductile iron	Up to 280 HB	GGG 60	0.7060	10 - 12	0.1 - 0.15	0.2 - 0.3	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	15-20	0.1 - 0.2	0.2 - 0.35	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	15-20	0.1 - 0.2	0.2 - 0.35	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	20 - 30	0.1 - 0.2	0.2 - 0.35	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	20 - 30	0.1 - 0.2	0.2 - 0.35	0.2 - 0.3	0.3 - 0.45	0.3 - 0.5

**ATORN® Solid carbide taper and deburring countersink**

• Please adjust these guideline values according to clamping operation and machine set-up!

150133....

150166....  
150171....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						6	10	16	20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	30 - 50	0.1	0.1	0.12	0.14	0.16
	Unalloyed structural steel	Up to 700	St-52	1.0052	30 - 50	0.1	0.1	0.12	0.14	0.16
	Structural steel	700 - 950	Ck45	1.1191	25 - 40	0.06	0.08	0.14	0.16	0.18
	Cast steel	Up to 950	GS 40	1.0416	12 - 20	0.06	0.07	0.1	0.12	0.15
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	20 - 35	0.07	0.1	0.16	0.18	0.2
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	8 - 20	0.05	0.05	0.06	0.07	0.08
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	12 - 20	0.05	0.06	0.08	0.1	0.12
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	15 - 30	0.08	0.1	0.12	0.15	0.18
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	12 - 25	0.07	0.1	0.12	0.15	0.18
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	10 - 20	0.05	0.07	0.1	0.12	0.14
	Ductile iron	Up to 280 HB	GGG 60	0.7060	12 - 22	0.06	0.08	0.11	0.14	0.16
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	12 - 22	0.06	0.08	0.11	0.14	0.16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	60 - 100	0.12	0.15	0.2	0.24	0.27
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	40 - 65	0.09	0.11	0.15	0.18	0.23
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	40 - 80	0.1	0.12	0.16	0.2	0.24
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	40 - 120	0.12	0.14	0.18	0.21	0.27
	Thermoplastic		PVC		30 - 65	0.12	0.14	0.17	0.2	0.25
	Thermoset		Melamine		15 - 35	0.1	0.12	0.15	0.18	0.24
	Graphite		C8000		5 - 10	Manual feed	Manual feed	Manual feed	Manual feed	Manual feed

**ATORN® Reverse countersink 180°**

• Please adjust these guideline values according to clamping operation and machine set-up!

152501....  
152504....

- For rotating use with stationary workpieces
  - For ISO indexable cutting inserts (CPMT or CCM and CCG)
  - With internal cooling, straight shank with clamping surface (Whistle-Notch)
- Ø15 and Ø 18 without internal cooling
1. Positioning: pay attention to the cutting edge position!
  2. Move from the centre to the cutting edge opposite "E".
  3. Move eccentrically through the bore.

4. Move back to the centre.
5. Reverse countersink with rotational speed "N" and feed "F".
6. Move from the centre to the cutting edge opposite "E" and retract from the hole.

Cutting speed Vc m/min	Feed F mm/rev
50 - 80	0.08 - 0.1

**ATORN® High helix taper reamer**

• Please adjust these guideline values according to clamping operation and machine set-up!

160150....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm				
						2 - 3	3 - 6	6 - 10	10 - 14	14 - 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	6 - 8	0.2 - 0.3	0.4-0.5	0.4-0.5	0.4 - 0.6	0.5 - 0.6
	Unalloyed structural steel	Up to 700	St-52	1.0052	6 - 8	0.2 - 0.3	0.4-0.5	0.4-0.5	0.4 - 0.6	0.5 - 0.6
	Structural steel	700 - 950	Ck45	1.1191	6 - 8	0.2 - 0.3	0.4-0.5	0.4-0.5	0.4 - 0.6	0.5 - 0.6
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	4 - 6	0.1 - 0.2	0.2 - 0.3	0.2 - 0.3	0.3 - 0.4	0.4-0.5
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	6 - 8	0.2 - 0.3	0.4-0.5	0.4-0.5	0.4 - 0.6	0.5 - 0.6
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	4 - 6	0.1 - 0.2	0.2 - 0.3	0.2 - 0.3	0.3 - 0.4	0.4-0.5
	Ductile iron	Up to 280 HB	GGG 60	0.7060	4 - 6	0.1 - 0.2	0.2 - 0.3	0.2 - 0.3	0.3 - 0.4	0.4-0.5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	6 - 8	0.2 - 0.3	0.4-0.5	0.4-0.5	0.4 - 0.6	0.4 - 0.6
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	6 - 8	0.2 - 0.3	0.4-0.5	0.4-0.5	0.4 - 0.6	0.4 - 0.6
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	6 - 8	0.2 - 0.3	0.4-0.5	0.4-0.5	0.4 - 0.6	0.4 - 0.6
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	6 - 8	0.2 - 0.3	0.4-0.5	0.4-0.5	0.4 - 0.6	0.4 - 0.6

## ATORN® HSS-E machine reamers



• Please adjust these guideline values according to clamping operation and machine set-up!

161001.... 161005.... 161015....  
 161002.... 161006.... 161035....  
 161003.... 161010.... 161020....

### TIN-coated reamers

f up to 100% greater than uncoated reamers

Vc can be increased up to 50%

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm									Coolant and lubricant
						5	8	10	15	20	25	30	40	50	
P	Machining steel	Up to 700	9 SMn 28	1.0715	8 - 10	0.1	0.13	0.15	0.2	0.25	0.25	0.3	0.35	0.4	Mild steel: Drilling oil emulsion, tallow, cutting oil  Tool steel, cast steel, tempering steel: Rapeseed oil substitute  Alloyed steel: Rapeseed oil substitute, cutting oil  Heat-resistant and stainless steel: Drilling oil
	Unalloyed structural steel	Up to 700	St-52	1.0052	10 - 12	0.1	0.13	0.15	0.2	0.25	0.25	0.3	0.35	0.4	
	Structural steel	700 - 950	Ck45	1.1191	6 - 8	0.1	0.13	0.15	0.2	0.25	0.25	0.3	0.35	0.4	
	Tempering steel	500 - 950	42 CrMo4	1.7225	6 - 10	0.1	0.13	0.15	0.2	0.25	0.25	0.3	0.35	0.4	
	Cast steel	Up to 950	GS 40	1.0416	4 - 6	0.07	0.08	0.1	0.13	0.18	0.18	0.22	0.25	0.3	
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	4 - 6	0.08	0.1	0.1	0.15	0.2	0.25	0.3	0.35	0.4	
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	8 - 10	0.18	0.2	0.23	0.25	0.3	0.3	0.35	0.4	0.45	Dry, rapeseed oil
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	4 - 6	0.12	0.15	0.17	0.2	0.25	0.25	0.3	0.35	0.4	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	8 - 10	0.18	0.2	0.23	0.25	0.3	0.3	0.35	0.4	0.45	
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	6 - 8	0.15	0.18	0.2	0.2	0.25	0.3	0.35	0.4	0.4	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	15-20	0.15	0.18	0.2	0.25	0.3	0.3	0.35	0.4	0.45	Tough aluminium: Turpentine oil substitute and petroleum 4:5 Hardened aluminium: Rapeseed oil
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	10 - 12	0.15	0.18	0.2	0.25	0.3	0.3	0.35	0.4	0.4	
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	8 - 12	0.15	0.18	0.2	0.25	0.3	0.3	0.35	0.4	0.45	Petroleum, turpentine oil
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	10 - 12	0.2	0.25	0.3	0.35	0.4	0.4	0.45	0.5	0.6	Drilling emulsion
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	12 - 14	0.2	0.25	0.3	0.35	0.4	0.4	0.45	0.5	0.6	Dry, rapeseed oil, drilling oil emulsion
	Thermoplastic		PVC		6 - 10	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.6	Dry, compressed air, no water
	Thermoset		Melamine		4 - 6	0.2	0.25	0.3	0.35	0.4	0.45	0.45	0.5	0.5	

## ATORN® Solid carbide machine reamers



• Please adjust these guideline values according to clamping operation and machine set-up!

163001.... 163002....  
 163005....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm									Coolant and lubricant
						5	8	10	15	20	25	30	40	50	
P	Machining steel	Up to 700	9 SMn 28	1.0715	10-15	0.15	0.18	0.2	0.25	0.3	0.3	0.35	0.4	0.5	Mild steel: Drilling oil emulsion, tallow, cutting oil  Tool steel, cast steel, tempering steel: Rapeseed oil substitute  Alloyed steel: Rapeseed oil substitute, cutting oil  Heat-resistant and stainless steel: Drilling oil
	Structural steel	700 - 950	Ck45	1.1191	8 - 12	0.15	0.18	0.2	0.25	0.3	0.3	0.35	0.4	0.5	
	Tempering steel	500 - 950	42 CrMo4	1.7225	8 - 12	0.15	0.18	0.2	0.25	0.3	0.3	0.35	0.4	0.5	
	Cast steel	Up to 950	GS 40	1.0416	6 - 10	0.12	0.15	0.15	0.18	0.2	0.2	0.25	0.3	0.4	
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	6 - 10	0.12	0.15	0.15	0.18	0.2	0.2	0.25	0.3	0.4	
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	8 - 12	0.2	0.26	0.3	0.35	0.4	0.4	0.45	0.5	0.6	Dry, rapeseed oil
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	6 - 10	0.15	0.18	0.2	0.25	0.3	0.3	0.35	0.4	0.5	
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	8 - 12	0.15	0.18	0.2	0.25	0.3	0.3	0.35	0.4	0.5	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	15 - 25	0.2	0.26	0.3	0.35	0.4	0.4	0.45	0.5	0.6	Tough aluminium: Turpentine oil substitute and petroleum 4:5 Hardened aluminium: Rapeseed oil
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	15 - 25	0.2	0.26	0.3	0.35	0.4	0.4	0.45	0.5	0.6	
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	20 - 30	0.3	0.36	0.4	0.45	0.5	0.5	0.55	0.6	0.7	Drilling emulsion
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	15 - 25	0.2	0.26	0.3	0.35	0.4	0.4	0.45	0.5	0.6	
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	15 - 25	0.2	0.26	0.3	0.35	0.4	0.4	0.45	0.5	0.6	Dry, rapeseed oil, drilling oil emulsion
	Thermoset		Melamine		15 - 25	0.3	0.36	0.4	0.45	0.5	0.5	0.55	0.6	0.7	Dry, compressed air, no water

## Undersize for reaming (guide values)

Normally the pre-drilled hole is reamed in one operation, whereby the undersize values specified in the table below are recommended for the use of fixed reamers.

The reaming allowance should be reduced for reamers with slotted bodies or inserted blades.

Pre- and post-reaming is performed for specific hole requirements and with particularly hard materials. Here, the table values below are reamed expediently in two equal parts.

Insufficient chip removal normally results in premature blunting because the teeth no longer cut, but simply press on the bore.

Materials group	Diameter range of the bore in mm				
	3 - 5	5 - 10	10 - 20	20 - 30	Over 30
Machining steel	0.1 - 0.2	0.2	0.2 - 0.3	0.3 - 0.4	0.4-0.5
Structural steel	0.1 - 0.2	0.2	0.2	0.3	0.3 - 0.4
Cast steel	0.1 - 0.2	0.2	0.2	0.2 - 0.3	0.3 - 0.4
Grey cast iron	0.1 - 0.2	0.2	0.2 - 0.3	0.3 - 0.4	0.4-0.5
Malleable cast iron	0.1 - 0.2	0.2	0.3	0.4	0.5
Copper	0.1 - 0.2	0.2 - 0.3	0.3 - 0.4	0.4-0.5	0.5
Copper alloy (bronze, brass)	0.1 - 0.2	0.2	0.2 - 0.3	0.3	0.3 - 0.4
Al. alloy long-chipping	0.1 - 0.2	0.2 - 0.3	0.3 - 0.4	0.4-0.5	0.5
Thermoset	0.1 - 0.2	0.3	0.4	0.4-0.5	0.5
Thermoplastic	0.1 - 0.2	0.2	0.2	0.3	0.3 - 0.4



## Fitting table for 1/100 machine reamers according to DIN 212



• Please adjust these guideline values according to clamping operation and machine set-up!

161030....

163002....

Bore diameter in mm	C8	C9	C10	C11	CD7	D7	D8	D9	D10	D11	D12	E7	E8	E9	EF8	F7	F8	F9	F10	G6	G7	H5	
1.0	1.07	1.07	1.08	1.10	1.04	1.02	1.03		1.04	1.06	1.08	1.02	1.02	1.03	1.02	1.01	1.01	1.02			1.01	1.00	
2.0	2.07	2.07	2.08	2.10	2.04	2.02	2.03		2.04	2.06	2.08	2.02	2.02	2.03	2.02	2.01	2.01	2.02			2.01	2.00	
3.0	3.07	3.07	3.08	3.10	3.04	3.02	3.03		3.04	3.06	3.08	3.02	3.02	3.03	3.02	3.01	3.01	3.02			3.01	3.00	
4.0	4.08	4.09			4.05	4.04	4.04	4.05	4.06	4.08	4.10		4.03	4.04	4.03		4.02	4.03	4.04	4.01	4.01	4.01	4.00
5.0	5.08	5.09			5.05	5.04	5.04	5.05	5.06	5.08	5.10		5.04	5.04	5.03		5.02	5.03	5.04	5.01	5.01	5.01	5.00
6.0	6.08	6.09			6.05	6.04	6.04	6.05	6.06	6.08	6.10		6.04	6.04	6.03		6.02	6.03	6.04	6.01	6.01	6.01	6.00
7.0	7.09	7.10			7.06	7.05	7.05	7.06	7.08	7.10		7.03	7.05	7.05	7.03	7.02	7.03		7.05	7.01	7.01	7.01	7.00
8.0	8.09	8.10			8.06	8.05	8.05	8.06	8.08	8.10		8.03	8.05	8.05	8.03	8.02	8.03		8.05	8.01	8.01	8.01	8.00
9.0	9.09	9.10			9.06	9.05	9.05	9.06	9.08	9.10		9.03	9.05	9.05	9.03	9.02	9.03		9.05	9.01	9.01	9.01	9.00
10.0	10.09	10.1			10.06	10.05	10.05	10.06	10.08	10.1		10.03	10.05	10.05	10.03	10.02	10.03		10.05	10.01	10.01	10.01	10.00
11.0						11.06		11.08	11.10			11.04	11.06	11.06			11.03	11.04	11.06	11.01		11.00	
12.0						12.06		12.08	12.10			12.04	12.06	12.06			12.03	12.04	12.06	12.01		12.00	

Bore diameter in mm	H6	H7	H8	H9	H10	H11	H12	H13	J6	J7	J8	JS7	JS8	JS9	K6	K7	K8	M6	M7	M8	N6	N7	
1.0	1.00		1.01		1.02	1.04	1.06	1.09	1.00	1.00	1.00	1.00	1.00	1.00			0.99			0.99	0.99	0.99	
2.0	2.00		2.01		2.02	2.04	2.06	2.09	2.00	2.00	2.00	2.00	2.00	2.00			1.99			1.99	1.99	1.99	
3.0	3.00		3.01		3.02	3.04	3.06	3.09	3.00	3.00	3.00	3.00	3.00	3.00			2.99			2.99	2.99	2.99	
4.0	4.00		4.01	4.02	4.03	4.05	4.08		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.99	3.99	3.99	3.99	
5.0	5.00		5.01	5.02	5.03	5.05	5.08		5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.99	4.99	4.99	4.99	4.99	
6.0	6.00		6.01	6.02	6.03	6.05	6.08		6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	5.99	5.99	5.99	5.99	5.99	
7.0	7.00	7.01	7.01	7.02	7.04	7.06	7.10		7.00	7.00	7.00	7.00	7.00			7.00	7.00	6.99	6.99	6.99		6.99	
8.0	8.00	8.01	8.01	8.02	8.04	8.06	8.10		8.00	8.00	8.00	8.00	8.00			8.00	8.00	7.99	7.99	7.99		7.99	
9.0	9.00	9.01	9.01	9.02	9.04	9.06	9.10		9.00	9.00	9.00	9.00	9.00			9.00	9.00	8.99	8.99	8.99		8.99	
10.0	10.00	10.01	10.02	10.02	10.04	10.06	10.1		10.00	10.00	10.00	10.00	10.00			10.00	10.00	9.99	9.99	9.99		9.99	
11.0		11.01	11.02	11.03	11.05	11.07			11.00	11.00	11.00	11.00	11.00			11.00	11.00	10.99	10.99	10.99		10.99	
12.0		12.01	12.02	12.03	12.05	12.07			12.00	12.00	12.00	12.00	12.00			12.00	12.00	11.99	11.99	11.99		11.99	

Bore diameter in mm	N8	P6	P7	P8	R6	R7	S6	S7	U6	U7	X7	X8	X9	Z7	Z8	Z9	Z10	ZA7	ZA8	ZB8	ZB9		
1.0	0.99	0.99	0.99	0.99			0.98	0.98	0.98	0.98		0.97	0.97	0.97	0.97		0.96	0.96		0.95	0.95		
2.0	1.99	1.99	1.99	1.99			1.98	1.98	1.98	1.98		1.97	1.97	1.97	1.97		1.96	1.96		1.95	1.95		
3.0	2.99	2.99	2.99	2.99			2.98	2.98	2.98	2.98		2.97	2.97	2.97	2.97		2.96	2.96		2.95	2.95		
4.0	3.99			3.98			3.98	3.98			3.97		3.96	3.96	3.96	3.95	3.95	3.96		3.94	3.94		
5.0	4.99			4.98			4.98	4.98			4.97		4.96	4.96	4.96	4.95	4.95	4.96		4.94	4.94		
6.0	5.99			5.98			5.98	5.98			5.97		5.96	5.96	5.96	5.95	5.95	5.96		5.94	5.94		
7.0	6.99				6.98	6.98			6.97	6.97		6.96	6.95	6.96	6.95		6.94	6.94	6.94			6.92	
8.0	7.99				7.98	7.98			7.97	7.97		7.96	7.95	7.96	7.95		7.94	7.94	7.94			7.92	
9.0	8.99				8.98	8.98			8.97	8.97		8.96	8.95	8.96	8.95		8.94	8.94	8.94			8.92	
10.0	9.99				9.98	9.98			9.97	9.97		9.96	9.95	9.96	9.95		9.94	9.94	9.94			9.92	
11.0	10.99	10.98	10.98	10.97			10.97	10.97			10.96	10.95		10.95	10.94		10.93			10.93	10.90	10.90	
12.0	11.99	11.98	11.98	11.97			11.97	11.97			11.96	11.95		11.95	11.94		11.93			11.93	11.90	11.90	

**BECK** | High-performance reamers HNC ecoSpeed  
MAPAL GROUP


• Please adjust these guideline values according to clamping operation and machine set-up!

163010....

163012....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed rates in mm/rev based on the tool diameter in mm						
						6 - 8	8 - 10	10 - 14	14 - 20	20 - 25	25 - 30	30 - 40
P	Unalloyed structural steel	Up to 700	St-52	1.0052	40 - 45	0,12	0,15	0,18	0,25	0,3	0,4	0,45
	Tempering steel	500 - 950	42 CrMo4	1.7225	30 - 35	0,12	0,15	0,18	0,25	0,3	0,4	0,45
	Cast steel	Up to 950	GS 40	1.0416	15 - 20	0,12	0,15	0,18	0,25	0,3	0,4	0,45
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	30 - 35	0,12	0,15	0,18	0,25	0,3	0,4	0,45
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	20 - 30	0,12	0,15	0,18	0,25	0,3	0,4	0,45
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	35 - 40	0,15	0,2	0,25	0,3	0,4	0,5	0,6
	Ductile iron	Up to 280 HB	GGG 60	0.7060	30 - 35	0,15	0,2	0,25	0,3	0,4	0,5	0,6
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	15 - 20	0,15	0,2	0,25	0,3	0,4	0,5	0,6

**SARA® Solid carbide high-performance reamers**

• Please adjust these guideline values according to clamping operation and machine set-up!

163510....

163512....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm					
						4	5	6	8	10	12
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 225	0.3	0.4	0.7	0.1	0.8	1
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 225	0.3	0.4	0.7	0.1	0.8	1
	Structural steel	700 - 950	Ck45	1.1191	80 - 225	0.3	0.4	0.7	0.1	0.8	1
	Tempering steel	500 - 950	42 CrMo4	1.7225	80 - 225	0.3	0.4	0.7	0.1	0.8	1
	Tempering steel	950 - 1300	43CrMo4	1.3563	80 - 225	0.3	0.4	0.7	0.1	0.8	1
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 180	0.3	0.4	0.7	0.1	0.8	1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 180	0.3	0.4	0.7	0.1	0.8	1
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	70 - 150	0.3	0.4	0.7	0.1	0.8	1
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	60 - 100	0.3	0.4	0.7	0.1	0.8	1
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60 - 115	0.3	0.4	0.7	0.1	0.8	1

## Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com

## ATORN® High-performance exchangeable head reamers

The universal exchangeable heads are characterised by a complete and particularly user-friendly range. The joint means the exchangeable heads can be changed quickly and easily, and with high repetition precision. Meanwhile perfect hold with maximum stability and rigidity is achieved. The exchangeable head

is tightened with a defined torque and requires a force-fitting and positive-fitting connection. High true running accuracy in conjunction with excellent rigidity are key features of this system.



Clean the taper, thread and flat surface of the exchangeable head using compressed air and a cloth.



Clean the taper, thread and flat surface of the exchangeable head mount using compressed air and a cloth.



Hand-tighten the exchangeable head clockwise in the exchangeable head mount. Then clamp the exchangeable head mount along with the tool in the machine mount.



Place the torque wrench as horizontal as possible on the exchangeable head and ensure the wrench surface is not tilted.



Tighten the exchangeable head using the torque wrench and the appropriate open-end snap-in spanner with the indicated tightening torque (see Table 'Exchangeable head tightening torque').



**Result:**  
the gap between the exchangeable head and exchangeable head holder is closed and the connection is force-fitting and positive-fitting. The exchangeable head is now ready for use.

## ATORN® High-performance exchangeable head reamers



• Please adjust these guideline values according to clamping operation and machine set-up!

### Geometry ST

163610....

163612....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed rates in mm/rev based on the tool diameter in mm		
						10 - 16	16 - 30	30 - 40
P	Unalloyed structural steel	Up to 700	St-52	1.0052	140 - 160	0,7 - 1	1 - 1,5	1,5 - 2
	Tempering steel	500 - 950	42 CrMo4	1.7225	120 - 160	0,7 - 1	1 - 1,5	1,5 - 2
	Cast steel	Up to 950	GS 40	1.0416	75 - 80	0,5 - 0,8	0,8 - 1,5	1,5 - 1,6
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80 - 140	0,7 - 1	1 - 1,5	1,5 - 2
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	80 - 140	0,7 - 1	1 - 1,5	1,5 - 2
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	100 - 120	0,5 - 0,6	0,6 - 1,2	1,2 - 1,6
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 120	0,5 - 0,6	0,6 - 1,2	1,2 - 1,6
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100 - 120	0,4 - 0,6	0,6 - 1,2	1,2 - 1,6

### Geometry VA

163620....

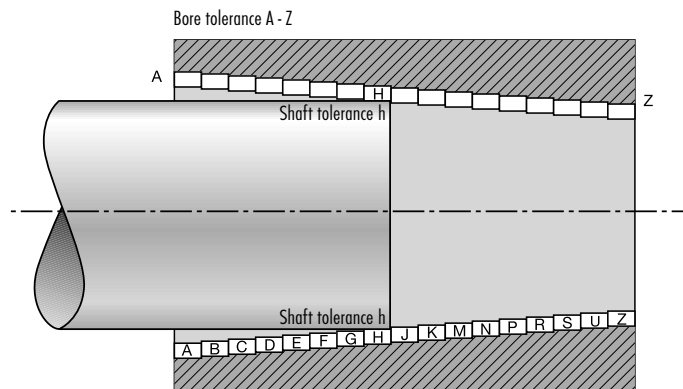
163622....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed rates in mm/rev based on the tool diameter in mm		
						10 - 16	16 - 30	30 - 40
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	35 - 40	0,3 - 0,4	0,4 - 0,5	0,5 - 1,2
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	35 - 40	0,3 - 0,4	0,4 - 0,5	0,5 - 1,2
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	25 - 30	0,3 - 0,4	0,4 - 0,5	0,5 - 1,2



# ISO standard shaft system fits

- (Excerpt from DIN 7155)
- **Nominal dimensions in  $\mu\text{m}$  (= 0.001 mm)**
- Maintain all shaft h-tolerances for system standard shaft. The maximum shaft dimension therefore goes up to the zero line and is equal to the nominal dimension. The smallest shaft dimension is smaller than its nominal value by the tolerance.
- All information is supplied without guarantee



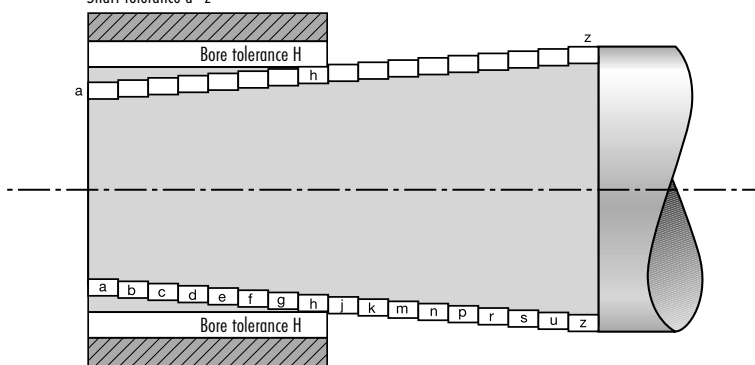
- Fitting type preferably according to DIN 7157
- (S = clearance fit)

Bores	Fitting type	Nominal dimension from ... to ... mm																		
		1 - 3	3 - 6	6 - 10	10 - 14	14 - 18	18 - 24	24 - 30	30 - 40	40 - 50	50 - 65	65 - 80	80 - 100	100 - 120	120 - 140	140 - 160	160 - 180	180 - 200	200 - 225	225 - 250
Shaft <b>h5</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		-4	-5	-6	-8	-9	-11	-13	-15	-18	-20	-22	-25	-28	-32	-36	-40	-45	-50	-55
<b>P 6</b>		-6	-9	-12	-15	-18	-21	-26	-31	-37	-45	-52	-61	-70	-80	-90	-100	-110	-120	-130
<b>N 6</b>		-4	-5	-7	-9	-11	-12	-14	-16	-18	-20	-22	-25	-28	-32	-36	-40	-45	-50	-55
<b>M 6</b>		-2	-1	-3	-4	-4	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17
<b>J 6</b>		+3	+5	+5	+6	+8	+10	+13	+16	+19	+22	+25	+29	+34	+39	+45	+50	+56	+62	+68
<b>H 6</b>		+3	+5	+5	+6	+8	+10	+13	+16	+19	+22	+25	+29	+34	+39	+45	+50	+56	+62	+68
		-4	-3	-4	-5	-5	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
		+6	+8	+9	+11	+13	+16	+19	+22	+25	+29	+34	+39	+45	+50	+56	+62	+68	+74	+80
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		-6	-8	-9	-11	-13	-16	-19	-22	-25	-29	-34	-39	-45	-50	-56	-62	-68	-74	-80
Shaft <b>h6</b>		-14	-15	-17	-21	-27	-34	-42	-48	-59	-66	-77	-85	-93	-105	-113	-123	-133	-143	-153
		-24	-25	-32	-39	-48	-59	-72	-78	-93	-101	-117	-125	-133	-151	-159	-169	-181	-191	-201
<b>S 7</b>		-10	-11	-13	-16	-20	-25	-30	-32	-38	-41	-48	-50	-53	-60	-63	-67	-73	-76	-81
<b>R 7</b>		-10	-11	-13	-16	-20	-25	-30	-32	-38	-41	-48	-50	-53	-60	-63	-67	-73	-76	-81
<b>N 7</b>		-4	-4	-4	-5	-7	-8	-9	-9	-10	-10	-12	-12	-12	-12	-12	-12	-12	-12	-12
<b>M 7</b>		-14	-16	-19	-23	-28	-33	-39	-45	-52	-61	-70	-80	-90	-100	-110	-120	-130	-140	-150
<b>M 7</b>		-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>K 7</b>		-12	-12	-15	-18	-21	-25	-30	-35	-40	-45	-50	-55	-60	-65	-70	-75	-80	-85	-90
<b>J 7</b>		+3	+3	+5	+6	+6	+7	+9	+10	+12	+12	+12	+12	+12	+12	+12	+12	+12	+12	+12
<b>J 7</b>		-6	-9	-10	-12	-15	-18	-21	-25	-30	-35	-40	-45	-50	-55	-60	-65	-70	-75	-80
<b>J 7</b>		+3	+6	+8	+10	+12	+14	+18	+22	+26	+30	+35	+40	+45	+50	+55	+60	+65	+70	+75
<b>H 7</b>	<b>S</b>	+9	+12	+15	+18	+21	+25	+30	+35	+40	+45	+50	+55	+60	+65	+70	+75	+80	+85	+90
<b>H 7</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>G 7</b>	<b>S</b>	+12	+16	+20	+24	+28	+34	+40	+47	+54	+61	+68	+75	+82	+90	+97	+105	+112	+120	+127
<b>G 7</b>		+2	4	+5	+6	+7	+9	+10	+12	+12	+12	+12	+12	+12	+12	+12	+12	+12	+12	+12
<b>F 7</b>		+16	+22	+28	+34	+41	+50	+60	+71	+83	+96	+110	+125	+140	+155	+170	+185	+200	+215	+230
<b>F 7</b>		+6	+10	+13	+16	+20	+25	+30	+36	+43	+50	+58	+66	+75	+84	+93	+102	+111	+120	+129
Shaft <b>h9</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		-25	-30	-36	-43	-52	-62	-74	-87	-100	-115	-130	-145	-160	-175	-190	-205	-220	-235	-250
<b>H 8</b>	<b>S</b>	+14	+18	+22	+27	+33	+39	+46	+54	+63	+72	+81	+90	+100	+110	+120	+130	+140	+150	+160
<b>H 8</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H 11</b>	<b>S</b>	+60	+75	+90	+110	+130	+160	+190	+220	+250	+290	+330	+370	+410	+450	+490	+530	+570	+610	+650
<b>H 11</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>F 8</b>	<b>S</b>	+20	+28	+35	+43	+53	+64	+76	+90	+106	+122	+139	+156	+173	+190	+207	+224	+241	+258	+275
<b>F 8</b>		+6	+10	+13	+16	+20	+25	+30	+36	+43	+50	+58	+66	+74	+82	+90	+98	+106	+114	+122
<b>E 9</b>	<b>S</b>	+39	+50	+61	+75	+92	+112	+134	+159	+185	+215	+245	+275	+305	+335	+365	+395	+425	+455	+485
<b>E 9</b>		+14	+20	+25	+32	+40	+50	+60	+72	+85	+98	+112	+126	+140	+154	+168	+182	+196	+210	+224
<b>D 10</b>	<b>S</b>	+60	+78	+98	+120	+149	+180	+220	+260	+305	+355	+405	+455	+505	+555	+605	+655	+705	+755	+805
<b>D 10</b>		+20	+30	+40	+50	+65	+80	+100	+120	+145	+170	+195	+220	+245	+270	+295	+320	+345	+370	+395
<b>C 11</b>	<b>S</b>	+120	+145	+170	+205	+240	+280	+330	+390	+450	+510	+570	+630	+690	+750	+810	+870	+930	+990	+1050
<b>C 11</b>		+60	+70	+80	+95	+110	+120	+130	+140	+150	+160	+170	+180	+190	+200	+210	+220	+230	+240	+250
Shaft <b>h11</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		-60	-75	-90	-110	-130	-160	-190	-220	-250	-290	-330	-370	-410	-450	-490	-530	-570	-610	-650
<b>H 11</b>	<b>S</b>	+60	+75	+90	+110	+130	+160	+190	+220	+250	+290	+330	+370	+410	+450	+490	+530	+570	+610	+650
<b>H 11</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>D 11</b>	<b>S</b>	+80	+105	+130	+160	+195	+240	+290	+340	+395	+460	+520	+580	+640	+700	+760	+820	+880	+940	+1000
<b>D 11</b>		+20	+30	+40	+50	+65	+80	+100	+120	+145	+170	+195	+220	+245	+270	+295	+320	+345	+370	+395
<b>C 11</b>	<b>S</b>	+120	+145	+170	+205	+240	+280	+330	+390	+450	+510	+570	+630	+690	+750	+810	+870	+930	+990	+1050
<b>C 11</b>		+60	+70	+80	+95	+110	+120	+130	+140	+150	+160	+170	+180	+190	+200	+210	+220	+230	+240	+250
<b>A 11</b>	<b>S</b>	+330	+345	+370	+400	+430	+470	+510	+550	+600	+630	+670	+710	+750	+790	+830	+870	+910	+950	+1000
<b>A 11</b>		+270	+270	+280	+290	+300	+310	+320	+330	+340	+350	+360	+370	+380	+390	+400	+410	+420	+430	+440

# ISO standard bore system fits

- (Excerpt from DIN 7154)
- **Nominal dimension in  $\mu\text{m}$  (= 0.001 mm)**
- In this system all bores are manufactured uniformly with an H-tolerance. The minimum bore dimension therefore goes precisely up to the zero line and is equal to the nominal dimension. The maximum dimension exceeds the zero line by the tolerance.
- All information is supplied without guarantee

Shaft tolerance a - z



- Fitting type preferably according to DIN 7157
- P = press fit
- S = clearance fit
- Ü = transition fit

Shafts	Fitting type	Nominal dimension from ... to ... mm																		
		1-3	3-6	6-10	10-14	14-18	18-24	24-30	30-40	40-50	50-65	65-80	80-100	100-120	120-140	140-160	160-180	180-200	200-225	225-250
<b>Bore H5</b>		+6 0	+8 0	+9 0	+11 0	+13 0	+16 0	+19 0	+22 0	+25 0	+29 0									
<b>p 5</b>		+10 +6	+17 +12	+21 +15	+26 +18	+31 +22	+37 +26	+45 +32	+52 +37	+61 +43	+70 +50									
<b>n 5</b>		+8 +4	+13 +18	+16 +10	+20 +12	+24 +15	+28 +17	+33 +20	+38 +23	+45 +27	+51 +31									
<b>k 6</b>		+6 0	+9 -1	+10 +1	+12 +1	+15 +2	+18 +2	+21 +2	+25 +3	+28 +3	+33 +4									
<b>j 6</b>		+4 -2	+6 -2	+7 -2	+8 -3	+9 -4	+11 -5	+12 -7	+13 -9	+14 -11	+16 -13									
<b>h 5</b>		0 -4	0 -5	0 -6	0 -8	0 -9	0 -11	0 -13	0 -15	0 -18	0 -20									
<b>Bore H6</b>		+10 0	+12 0	+15 0	+18 0	+21 0	+25 0	+30 0	+35 0	+40 0	+46 0									
<b>s 6</b>	<b>P</b>	+20 +14	+27 +19	+32 +23	+39 +28	+48 +35	+59 +43	+72 +35	+78 +59	+93 +71	+101 +79	+117 +92	+125 +100	+133 +108	+151 +122	+159 +130	+169 +140			
<b>r 6</b>	<b>P</b>	+16 +10	+23 +15	+28 +19	+34 +23	+41 +28	+50 +34	+60 +41	+62 +43	+73 +51	+76 +54	+88 +63	+90 +65	+93 +68	+106 +77	+109 +80	+113 +84			
<b>n 6</b>	<b>Ü</b>	+10 +4	+16 +8	+19 +10	+23 +12	+28 +15	+33 +17	+39 +20	+45 +23	+52 +27	+60 +31									
<b>m 6</b>		+8 +2	+12 +4	+15 +6	+18 +7	+21 +8	+25 +9	+30 +11	+35 +13	+40 +15	+46 +17									
<b>k 6</b>	<b>Ü</b>	+6 0	+9 -1	+10 +1	+12 +1	+15 +2	+18 +2	+21 +2	+25 +3	+28 +3	+33 +4									
<b>j 6</b>	<b>Ü</b>	+4 -2	+6 -2	+7 -2	+8 -3	+9 -4	+11 -5	+12 -7	+13 -9	+14 -11	+16 -13									
<b>h 6</b>	<b>S</b>	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16	0 -19	0 -22	0 -25	0 -29									
<b>g 6</b>	<b>S</b>	-2 -8	-4 -12	-5 -14	-6 -17	-7 -20	-9 -25	-10 -29	-12 -34	-14 -39	-15 -44									
<b>f 7</b>	<b>S</b>	-6 -16	-10 -22	-13 -28	-16 -34	-20 -41	-25 -50	-30 -60	-36 -71	-43 -83	-50 -96									
<b>Bore H9</b>		+14 0	+18 0	+22 0	+27 0	+33 0	+39 0	+46 0	+54 0	+63 0	+72 0									
<b>x 8</b>	<b>P</b>	+34 +20	+46 +28	+56 +34	+67 +40	+72 +45	+87 +54	+97 +64	+119 +80	+136 +97	+168 +122	+192 +146	+232 +178	+264 +210	+311 +248	+343 +280	+373 +310	+422 +350	+457 +385	+497 +425
<b>x 8</b>	<b>P</b>	-	-	-	-	-	+81 +48	+99 +60	+109 +70	+133 +87	+148 +102	+178 +124	+198 +144	+233 +170	+253 +190	+273 +210	+308 +236	+330 +258	+356 +284	
<b>h 9</b>	<b>S</b>	0 -25	0 -30	0 -36	0 -43	0 -52	0 -62	0 -74	0 -87	0 -100	0 -115									
<b>f 7</b>	<b>S</b>	-6 -16	-10 -22	-13 -28	-16 -34	-20 -41	-25 -50	-30 -60	-36 -71	-43 -83	-50 -96									
<b>d 9</b>	<b>S</b>	-20 -45	-30 -60	-40 -76	-50 -93	-65 -117	-80 -142	-100 -174	-120 -207	-145 -245	-170 -285									
<b>Bore H11</b>		+60 0	+75 0	+90 0	+110 0	+130 0	+160 0	+190 0	+220 0	+250 0	+290 0									
<b>h 9</b>	<b>S</b>	0 -25	0 -30	0 -36	0 -43	0 -52	0 -62	0 -74	0 -87	0 -100	0 -115									
<b>h 11</b>	<b>S</b>	0 -60	0 -75	0 -90	0 -110	0 -130	0 -160	0 -190	0 -220	0 -250	0 -290									
<b>d 9</b>	<b>S</b>	-20 -45	-30 -60	-40 -76	-50 -93	-65 -117	-80 -142	-100 -174	-120 -207	-145 -245	-170 -285									
<b>d 9</b>	<b>S</b>	-60 -120	-70 -145	-80 -170	-95 -205	-110 -240	-120 -280	-130 -290	-140 -330	-150 -340	-170 -390	-180 -400	-200 -450	-210 -460	-230 -480	-245 -530	-260 -550	-280 -570		
<b>c 11</b>	<b>S</b>	-270 -330	-270 -345	-280 -370	-290 -400	-300 -430	-310 -470	-320 -480	-340 -530	-360 -550	-380 -600	-410 -630	-460 -710	-520 -770	-580 -830	-660 -950	-740 -1030	-870 -1110		

## Supplement to ISO standard bore system fits

INFO

- (Excerpt from DIN 7154)
- **Nominal dimension in  $\mu\text{m}$  (= 0.001 mm)**

Shafts	Nominal dimension from ... to ... mm										
	1 - 3	3 - 6	6 - 10	10 - 18	18 - 30	30 - 50	50 - 80	80 - 120	120 - 180	180 - 250	
External dimensions	d 11	-20	-30	-40	-50	-65	-80	-100	-120	-145	-170
		-80	-105	-130	-160	-195	-240	-290	-340	-395	-460
	e 8	-14	-20	-25	-32	-40	-50	-60	-72	-85	-100
		-28	-38	-47	-59	-73	-89	-106	-126	-148	-172
	f 9	-6	-10	-13	-16	-20	-25	-30	-36	-43	-50
		-31	-40	-49	-59	-72	-87	-104	-123	-143	-165
	h 7	0	0	0	0	0	0	0	0	0	0
		-10	-12	-15	-18	-21	-25	-30	-35	-40	-46
	h 8	0	0	0	0	0	0	0	0	0	0
		-14	-18	-22	-27	-33	-39	-46	-54	-63	-72
	h 10	0	0	0	0	0	0	0	0	0	0
		-40	-48	-58	-70	-84	-100	-120	-140	-160	-185
	h 12	0	0	0	0	0	0	0	0	0	0
		-100	-120	-150	-180	-210	-250	-300	-350	-400	-460
	js 11	+30	+38	+45	+55	+65	+80	+95	+110	+125	+145
		-30	-37	-45	-55	-65	-80	-95	-110	-125	-145
js 14	+125	+150	+180	+215	+260	+310	+370	+435	+500	+575	
	-125	-150	-180	-215	-260	-310	-370	-435	-500	-575	
js 16	+300	+375	+450	+550	+650	+800	+950	+1100	+1250	+1450	
	-300	-375	-450	-550	-650	-800	-950	-1100	-1250	-1450	
k 10	+40	+48	+58	+70	+84	+100	+120	+140	+160	+185	
	0	0	0	0	0	0	0	0	0	0	
k 11	+60	+75	+90	+110	+130	+160	+190	-220	+250	+290	
	0	0	0	0	0	0	0	0	0	0	
k 12	+90	+120	+150	+180	+210	+250	+300	+350	+400	+460	
	0	0	0	0	0	0	0	0	0	0	
k 16	+600	+750	+900	+1100	+1300	+1600	+1900	+2200	+2500	2900	
	0	0	0	0	0	0	0	0	0	0	

## Guideline values for surface qualities

INFO

Roughness depth range Rz $\mu\text{m}$	Rt specification $\mu\text{m}$	complies with Ra value	ISO roughness classes	ISO 1302	Corner radius r (mm) and feed f (mm)			
					r = 0.4	r = 0.8	r = 1.2	r = 1.6
63 - 100	Rt 100	12.5 - 25	N 11	25.0	-	0.51	0.69	0.88
40 - 63	Rt 63	6.3-25	N 10	12.5	0.27	0.43	0.56	0.68
31.5 - 40	Rt 40	4.9 - 6.3	N 9	6.3	0.25	0.37	0.49	0.57
25 - 31.5	Rt 31.5	4.0 - 4.9	N 9	6.3	0.22	0.32	0.41	0.47
16 - 25	Rt 25	2.5 - 4.0	N 8	3.2	0.20	0.28	0.36	0.39
10 - 16	Rt 16	1.6 - 2.5	N 8	3.2	0.15	0.22	0.29	0.31
6.3 - 10	Rt 10	1.0 - 1.6	N 7	1.6	0.10	0.13	0.18	0.20

## Calculation formula (theoretical value):

$$R_t = \frac{f^2}{8 \times r} \times 1000 \mu\text{m}$$

Rt = surface quality  $\mu\text{m}$ 

f = feed mm/rev

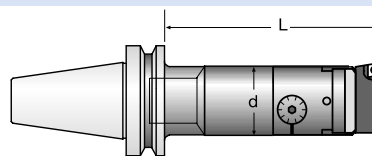
r = corner radius mm

## Feed calculation

$$f = \sqrt{\frac{R_t \times 8 \times r}{1000}} \text{ mm}$$

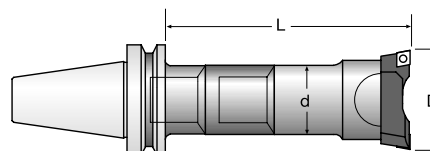
**D'ANDREA® Modular tool system**

• Please adjust these guideline values according to clamping operation and machine set-up!



**Cutting data for micrometric boring bars**

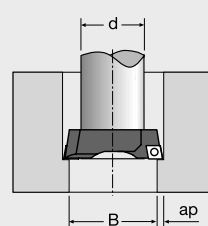
ISO	Materials group	Strength/ Hardness	Boring bars Dimensions L / d mm	Working conditions	Cutting speed Vc m/min	Feed f mm/rev		Indexable insert quality	Clamp depth  ap mm
						r = 0.2 mm	r = 0.4 mm		
P	Carbon steel	≤ 200 HB	2.5	Good	200 - 300	0.05 - 0.08	0.07 - 0.1	Cermet DC 100 (T) LN 10 DP 300	0.1 - 0.25
			4	Normal	160 - 250	0.05 - 0.08	0.07 - 0.1		
			6.3	Difficult	70 - 100	0.05 - 0.08	-		
		> 200 HB	2.5	Good	160 - 250	0.05 - 0.08	0.07 - 0.1	Cermet DC 100 (T) LN 10	
			4	Normal	150 - 200	0.05 - 0.08	0.07 - 0.1		
			6.3	Difficult	70 - 100	0.05 - 0.08	-		
M	Stainless steel		2.5	Good	120 - 160	0.05 - 0.08	0.07 - 0.1	DP 300 LN 10	
			4	Normal	100 - 140	0.05 - 0.08	0.07 - 0.1		
			6.3	Difficult	70 - 100	0.05 - 0.08	-		
K	Cast iron		2.5	Good	120 - 160	0.05 - 0.08	0.07 - 0.1	Cermet DC 100 (T) LN 10 DK 100	
			4	Normal	100 - 140	0.05 - 0.08	0.07 - 0.1		
			6.3	Difficult	70 - 100	0.05 - 0.08	-		
N	Aluminium		2.5	Good	300 - 400	0.05 - 0.08	0.07 - 0.1	DK 100 D20 MDC Diamant	
			4	Normal	250 - 350	0.05 - 0.08	0.07 - 0.1		
			6.3	Difficult	100 - 150	0.05 - 0.08	-		
H	Hardened materials	> 50 HRc	2.5	Good	80-100	0.04 - 0.06	0.05 - 0.07	D25 CBN	
			4	Normal	50 - 100	0.04 - 0.06	0.05 - 0.07		



**Cutting data for roughing operations with two-flute cutter boring bars**

ISO	Materials group	Strength/ Hardness	Boring bars Dimensions L / d mm	Working conditions	Cutting speed Vc m/min			Feed f mm/rev		
					Ø < 38 mm	Ø 38-120 mm	Ø > 120 mm	r = 0.2 mm	r = 0.4 mm	r = 0.8 mm
P	Carbon steel	≤ 200 HB	2.5	Good	120-180	140 - 200	160 - 250	-	0.2 - 0.4	0.3 - 0.5
			4	Normal	100 - 160	120-180	140 - 200	-	0.2 - 0.4	0.3 - 0.5
			6.3	Difficult	70 - 100	70 - 100	70 - 100	0.15 - 0.3	0.2 - 0.4	-
		> 200 HB	2.5	Good	100 - 160	120-180	140 - 200	-	0.2 - 0.4	0.3 - 0.5
			4	Normal	80 - 140	100 - 160	120-180	-	0.2 - 0.4	0.3 - 0.5
			6.3	Difficult	60 - 90	70 - 100	70 - 100	0.15 - 0.3	0.2 - 0.4	-
M	Stainless steel		2.5	Good	80 - 110	90 - 120	100 - 140	-	0.2 - 0.4	0.3 - 0.5
			4	Normal	70 - 100	80 - 110	90 - 120	-	0.2 - 0.4	0.3 - 0.5
			6.3	Difficult	60 - 90	60 - 90	60 - 90	0.15 - 0.3	0.2 - 0.4	-
K	Cast iron		2.5	Good	90 - 120	100 - 140	120 - 160	-	0.2 - 0.4	0.3 - 0.5
			4	Normal	70 - 100	90 - 120	100 - 140	-	0.2 - 0.4	0.3 - 0.5
			6.3	Difficult	60 - 90	60 - 90	60 - 90	0.15 - 0.3	0.2 - 0.4	-
N	Aluminium		2.5	Good	160 - 250	200 - 300	250 - 350	-	0.3 - 0.5	0.4 - 0.6
			4	Normal	140 - 200	160 - 250	200 - 300	-	0.3 - 0.5	0.4 - 0.6
			6.3	Difficult	100 - 150	100 - 150	100 - 150	0.2 - 0.4	0.3 - 0.5	-

Working area Ø mm	Max. clamp depth ap mm	
	Steel	Cast iron / aluminium
18 - 28	1.5 - 2	2 - 2.5
28 - 50	2 - 3	2.5 - 3.5
50 - 68	3 - 4	3.5 - 5
68 - 200	4 - 5	5 - 7
200 - 500	5 - 6	6 - 8



It is advisable to start with hole Ø B ≥ boring bars Ø d

Twin-cutter boring  
with equal bore diameter

Twin-cutter boring  
with different bore diameters

Attention: For boring bars with different bore Ø the pre-feed must be reduced by half in accordance with the table!

# Milling tools



## Saw blades

	Machine saw blades	425
	Metal saw blades	429
	Metal circular saw blades	430

## HSS milling tools

	Disc milling cutters	438
	Shell end mills	439
<b>INFO</b>	HSS / solid carbide	441
<b>INFO</b>	Overview of end milling cutters HSS / HSS-E / HSS-E-PM	442
	End milling cutters HSS / HSS-E / HSS-E-PM	446
	Form milling cutter HSS	459

## Solid carbide milling tools



















<b>INFO</b>	Overview of solid carbide end milling cutters	462
	Solid carbide end milling cutter	466
	Front face torus milling cutters WXS-CRE <b>NEW</b>	480
	Radius milling cutters 220° <b>NEW</b>	483
	HPC series solid carbide	484
	HPC power milling range	492

	Trochoidal end milling cutters	495
	Aluminium solid carbide milling range Ultra N	499
	Aluminium solid carbide milling range Ultra N PRO	516
	Solid carbide milling range Stainless steel / Titanium / Special alloy	525
	Graphite solid carbide milling cutter DIA+	534
	PKD milling cutter <b>NEW</b>	539
	Solid carbide contour milling cutter for GFRP and CFRP	541
	Rotary cutters	547
	Solid carbide milling range RockTec 52 and 65 HRc	553
	Hard milling range RockTec PRO 47 to 65 HRc <b>NEW</b>	580

## Form milling cutters and deburring tools

	Sealing surface milling cutter ceramic milling cutters	597
	Circle segment milling cutter	599
	Solid carbide die-sinking cutters	600
	Solid carbide form milling cutters	601
	Solid carbide engraving milling cutters	602
	Multifunction tool	603
	Solid carbide deburring tools	604

	Solid carbide forward and reverse deburring tools	605
	Orbitool deburring tool	607
<b>Thread milling cutter</b>		
<b>INFO</b>	Thread milling Circular milling	608
	ATORN thread milling cutters	609
	SARA thread milling cutters	<b>NEW</b> 611
	Indexable insert thread milling cutter	617
	Circular cutters	621
	Vertical thread-milling range	624
<b>Indexable insert milling cutters and modular milling systems</b>		
<b>INFO</b>	Milling systems	633
	Modular milling system	636
	Indexable insert face milling cutters	646
	Indexable insert copy milling cutter	651
	Indexable insert shoulder milling cutter SDMT	654
	Indexable milling cutter inserts APKT 06	654
	Indexable milling cutter inserts APKT 10	656
	Indexable milling cutter inserts APKT 16	665
	Indexable milling cutter inserts 4-10 / 4-15 Power	672
	Indexable milling cutter inserts SP.T	674
	Shoulder milling cutter 90° WNEU 04/08	677

	Tangential milling cutters	679
	Tangential milling cutters TGPLUS 90190	<b>NEW</b> 680
	High-speed milling cutters AD..X 06.. AD..X 09.. AD..X 12.. AD..X 17..	681
	High feed-rate milling cutters XDM..	689
	High feed-rate milling cutters XCN..	691
	High feed-rate milling cutters HIFEEED 06410 / 06690	695
	Milling cutter 90° LINEPRO 20090/20190/20290	697
	High feed-rate milling cutters TETRAFEED	<b>NEW</b> 703
	Milling cutter 95° LINEPRO 40095/41095/40595	704
	Plunge milling cutters for non-ferrous metals	706
	Indexable insert copy milling cutter TOROMILL	708
	Ball-nose and torus milling cutters	711
	Indexable insert milling counter- bore, adjustable	718
	Chamfer cutters	721
	Indexable T-slot cutter inserts	725
<b>INFO</b>	ISO milling inserts	726
	Indexable insert disc milling cutters	735
	Disc milling cutters with long inserts	<b>NEW</b> 737
	Push broaches	738
<b>Technical information, usage recommendations</b>		739



## Summary of icons used for milling tools

INFO

<b>Cutting material</b>	<b>HSS</b> High-performance, high-speed steel	<b>HSS-E</b> High-performance, high-speed steel Cobalt-alloyed	<b>VHM</b> Solid carbide
<b>Coating</b>	<b>TiN</b> Titanium-nitride coating	<b>TiCN</b> Titanium-carbo-nitride coating	<b>TiAlN</b> Titanium-aluminium-nitride coating
<b>Surface treatment</b>	<b>Nit.</b> Nitrided surface	<b>Vap.</b> Vapour-treated surface (steam-treated)	
<b>Type/profile</b>	<b>Typ N</b> e.g. type N, for normal materials	<b>NF</b> e.g. NF Roughing-finishing toothing	<b>HR</b> e.g. HR Fine knuckle-type toothing
<b>Standard</b>	<b>DIN 327</b> Complies with DIN 327	<b>DIN 844</b> Complies with DIN 844	<b>Werk-norm</b> Complies with factory standard
<b>Shank design</b>	<b>DIN 6535 HA</b> e.g. straight shank according to DIN 6535 HA	e.g. straight shank with Weldon clamping surface	e.g. MT shank
<b>Number of cutting edges</b>	<b>Z 3</b> e.g. 3 cutting edges and/or 3 insert seats	<b>Z 5</b> e.g. 5 cutting edges and/or 5 insert seats	<b>Z 8+</b> e.g. 8 or more cutting edges and/or 8 or more insert seats
<b>Spiral angle</b>	30° e.g. 30° right-hand twist	e.g. unequal helix angle	10° e.g. 10° left-handed twist
<b>Tooth pitch</b>	Unequal tooth pitch		
<b>Tolerance</b>	Shank tolerance	Diameter tolerance	Radius tolerance
<b>Application</b>	Centre cutting	Over-centre cutting	
<b>Coolant design</b>	Axial coolant bore	Radial coolant bore	
<b>Milling technology</b>	<b>HSC</b> High-Speed-Cutting (High-speed milling)	<b>HPC</b> High-Performance-Cutting (High-performance milling)	<b>TVC</b> Trochoidal-Volume-Cutting (Trochoidal milling)
<b>Cutting data</b>	More information such as cutting data recommendations in the technical appendix		
<b>Milling applications</b>	Face milling	Corner milling	Groove milling
	Face milling	Pocket milling	Chamfering
	Circular cutting	Drill cutting	Ramping
	Copy milling	Contour milling	T-groove milling
<b>suitable for</b>	<b>3D PRINT</b> 3D additive		

## Usage recommendations diagram (example)

- **Materials group**
- **Usage recommendation:** Depicted by ISO colour code. Full dot = very well suited, circle = well suited
- **Recommended cutting speed:** Cutting speed range  $V_c$  m/min. for medium-sized tool diameter.

material	steel			stainless steel			cast iron		titanium alloys		superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	● very well suited ○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG / GTS	GGG	< 8 % Si	≥ 8 % Si	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	○	●	●	○	●	○	●	○	○	○	●	○	○	○	○	
		150-200	80-120	70-90	60-90	40-70	40-70	80-120	80-120	60-70	20-35	15-30	280-350	200-250	120-200	120-200	60-90	40-70	40-70

Cutting speed  $V_c$  m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Cutting data recommendations for groove and side milling directly on the item

INFO

Main application area according to ISO  
 Groove milling      Side milling

D h9 mm	F mm	L1 mm	L mm	D1 h5 mm	Z	Feed rate fz Steel < 1,000 N/mm <sup>2</sup> mm/Z	Feed rate fz Steel < 1,000 N/mm <sup>2</sup> mm/Z	Item no.	€
6.0	0.25	16	64	6.0	3	0.050	0.049	254015 0060	54.20
8.0	0.50	20	64	8.0	3	0.070	0.049	254015 0080	70.90

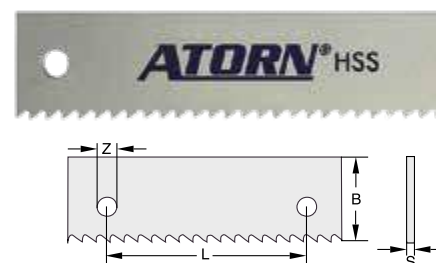
## ATORN® Machine saw blades HSS



- Precision-machined machine saw blade HSS with special heat treatment for a long service life
- Very high surface quality for exact and straight cutting
- High-quality cutting material for high demands on service life
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS DMo 5 Quality (Material No. 1.3343)
- **For materials up to a tensile strength of 1100 N/mm<sup>2</sup>**

L mm	B mm	S mm	Z mm	Tooth per inch	art.no.	€
300	25	1.50	8.5	10	620520 3010	8,05
300	25	1.50	8.5	14	620520 3014	8,05
350	30	1.50	8.5	6	620520 3506	10,30
350	30	1.50	8.5	8	620520 3508	10,30
350	30	1.50	8.5	10	620520 3510	10,30
350	30	1.50	8.5	14	620520 3514	10,30
350	30	2.00	8.5	4	620520 3604	12,60
350	30	2.00	8.5	6	620520 3606	12,60
350	30	2.00	8.5	8	620520 3608	12,60
350	30	2.00	8.5	10	620520 3610	12,60
400	25	1.25	8.5	14	620520 4014	8,15
400	25	1.25	8.5	22	620520 4022	8,15
400	25	1.50	8.5	10	620520 4110	9,60
400	25	1.50	8.5	14	620520 4114	9,60
400	30	1.50	8.5	6	620520 4106	11,10
400	30	1.50	8.5	8	620520 4108	11,10
400	30	1.50	8.5	10	620520 4210	11,10
400	30	1.50	8.5	14	620520 4214	11,10
400	30	1.50	8.5	18	620520 4218	11,10
400	30	1.50	8.5	22	620520 4222	11,10
400	30	2.00	8.5	4	620520 4304	13,75
400	30	2.00	8.5	6	620520 4306	13,75
400	30	2.00	8.5	8	620520 4308	13,75
400	30	2.00	8.5	10	620520 4310	13,75
400	40	2.00	10.5	4	620520 4404	17,60
400	40	2.00	10.5	6	620520 4406	17,60
400	40	2.00	10.5	8	620520 4408	17,60
450	30	2.00	10.5	6	620520 4506	14,90
450	30	2.00	10.5	8	620520 4508	14,90
450	40	2.00	10.5	4	620520 4604	19,15
450	40	2.00	10.5	6	620520 4606	19,15
450	40	2.00	10.5	8	620520 4608	19,15
450	40	2.00	10.5	10	620520 4610	19,15
500	40	2.00	10.5	6	620520 5006	20,70
500	40	2.00	10.5	8	620520 5008	20,70
550	50	2.50	12.5	6	620520 5506	34,80
600	50	2.50	12.5	6	620520 6006	37,20
650	50	2.50	12.5	4	620520 6504	39,50
650	50	2.50	12.5	6	620520 6506	39,50

6132



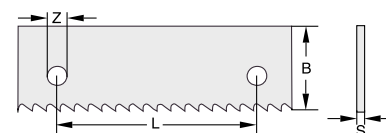
## ATORN® Machine saw blades HSS-Co



- Long service life and short cutting times
- Cobalt-alloyed machine saw blades are particularly suitable for tough and hard materials such as alloyed, unalloyed and heat-treated steel, as well as high-strength steel and stainless steel.
- High-quality cutting material for high demands on service life
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS-Co. EMo 5 Co 5 Quality (Material No. 1.3243).
- **For extremely hard materials up to 1300 N/mm<sup>2</sup> e.g. austenitic steels and steels with a high chromium-nickel content**

L mm	B mm	S mm	Z mm	Tooth per inch	art.no.	€
400	32	2.00	8.5	4	620521 4004	23,20
400	32	2.00	8.5	6	620521 4006	23,20
400	32	2.00	8.5	8	620521 4008	23,20
450	40	2.00	10.5	4	620521 4504	30,50
450	40	2.00	10.5	6	620521 4506	30,50
450	40	2.00	10.5	8	620521 4508	30,50

6132



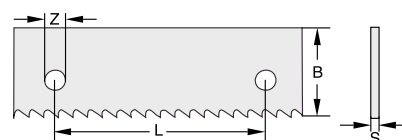
## ATORN® Machine saw blades HSS bi-metal



- Long service life and short cutting times
- The perfect combination of flexibility and durability with special heat treatment for a long service life
- Very high surface quality for exact and straight cutting
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS bi-metal, DMo 5-cutting edge quality (Material No. 1.3343) on a special steel back
- **For materials up to a tensile strength of 1100 N/mm<sup>2</sup>**

L mm	B mm	S mm	Z mm	Tooth per inch	art.no.	€
300	32	1.60	8.5	10	620522 3010	11,40
350	32	1.60	8.5	6	620522 3506	12,40
350	32	1.60	8.5	8	620522 3508	12,40
400	32	1.60	8.5	4	620522 4004	13,35
400	32	1.60	8.5	6	620522 4006	13,35
400	32	1.60	8.5	8	620522 4008	13,35
500	38	1.90	10.5	6	620522 5006	22,60
500	50	2.50	12.5	6	620522 5106	38,40
600	50	2.50	12.5	4	620522 6004	43,30
600	50	2.50	12.5	6	620522 6006	43,30

6132



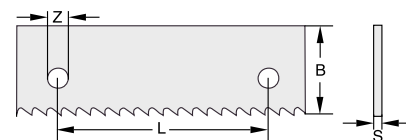
## ATORN® Machine saw blades HSS for KASTO saws



- Precision-machined machine saw blade HSS with special heat treatment for a long service life
- Very high surface quality for exact and straight cutting
- High-quality cutting material for high demands on service life
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS DMo 5 Quality (Material No. 1.3343)
- **For materials up to a tensile strength of 1100 N/mm<sup>2</sup>**

L mm	B mm	S mm	Z mm	Tooth per inch	art.no.	€
300	30	1.50	8.5	6	620523 3006	9,40
300	30	1.50	8.5	10	620523 3010	9,40
300	30	1.50	8.5	14	620523 3014	9,40
350	36	2.00	8.5	4	620523 3504	14,50
350	36	2.00	8.5	6	620523 3506	14,50
350	36	2.00	8.5	10	620523 3510	14,50
400	32	2.00	8.5	4	620523 4004	14,25
400	32	2.00	8.5	6	620523 4006	14,25
400	32	2.00	8.5	8	620523 4008	14,25
400	32	2.00	8.5	10	620523 4010	14,25
450	36	2.00	8.5	4	620523 4504	17,20
450	36	2.00	8.5	6	620523 4506	17,20
450	36	2.00	8.5	8	620523 4508	17,20
450	40	2.00	8.5	4	620523 4604	19,15
450	40	2.00	8.5	6	620523 4606	19,15
450	40	2.00	8.5	8	620523 4608	19,15
450	40	2.00	8.5	10	620523 4610	19,15
550	45	2.00	10.5	4	620523 5504	24,40
550	45	2.00	10.5	6	620523 5506	24,40
575	50	2.50	10.5	4	620523 5704	36,-
575	50	2.50	10.5	6	620523 5706	36,-
600	50	2.50	10.5	4	620523 6004	37,20
600	50	2.50	10.5	6	620523 6006	37,20
650	55	2.50	10.5	4	620523 6504	43,90
650	55	2.50	10.5	6	620523 6506	43,90
700	55	2.50	10.5	4	620523 7004	46,60
700	55	2.50	10.5	6	620523 7006	46,60

6132



### Over 200,000 tools available online!

#### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com

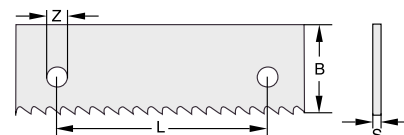
## ATORN® Machine saw blades HSS-Co for KASTO saws



- Long service life and short cutting times
- Cobalt-alloyed machine saw blades are particularly suitable for tough and hard materials such as alloyed, unalloyed and heat-treated steel, as well as high-strength steel and stainless steel.
- High-quality cutting material for high demands on service life
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS-Co. EMo 5 Co 5 Quality (Material No. 1.3243).
- **For extremely hard materials up to 1300 N/mm<sup>2</sup> e.g. austenitic steels and steels with a high chromium-nickel content**

L mm	B mm	S mm	Z mm	Tooth per inch	art.no.	€
400	36	2.00	8.5	4	<b>620524 4004</b>	<b>25,20</b>
400	36	2.00	8.5	6	620524 4006	<b>25,20</b>
450	40	2.00	8.5	4	620524 4504	<b>30,50</b>
450	40	2.00	8.5	6	620524 4506	<b>30,50</b>
450	40	2.00	8.5	8	620524 4508	<b>30,50</b>
450	40	2.00	8.5	10	620524 4510	<b>30,50</b>
500	40	2.00	8.5	6	620524 5006	<b>32,70</b>
550	45	2.00	10.5	6	620524 5506	<b>38,60</b>
600	50	2.50	10.5	4	620524 6004	<b>59,-</b>
600	50	2.50	10.5	6	620524 6006	<b>59,-</b>
700	55	2.50	10.5	4	620524 7004	<b>74,80</b>
700	55	2.50	10.5	6	620524 7006	<b>74,80</b>

6132



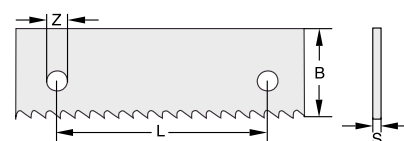
## ATORN® Machine saw blades HSS bi-metal for KASTO saws



- Long service life and short cutting times
- The perfect combination of flexibility and durability with special heat treatment for a long service life
- Very high surface quality for exact and straight cutting
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS bi-metal. DMo 5-cutting-edge quality (Material No. 1.3343) on a special steel back
- **For materials up to a tensile strength of 1100 N/mm<sup>2</sup>**

L mm	B mm	S mm	Z mm	Tooth per inch	art.no.	€
400	38	1.90	8.5	4	<b>620525 4004</b>	<b>19,75</b>
400	38	1.90	8.5	6	620525 4006	<b>19,75</b>
400	38	1.90	8.5	10	620525 4010	<b>19,75</b>
500	38	1.90	10.5	6	620525 5006	<b>22,60</b>
575	50	2.50	10.5	4	620525 5704	<b>42,20</b>
575	50	2.50	10.5	6	620525 5706	<b>42,20</b>
600	50	2.50	10.5	4	620525 6004	<b>43,30</b>
600	50	2.50	10.5	6	620525 6006	<b>43,30</b>
700	50	2.50	10.5	4	620525 7004	<b>48,30</b>
700	50	2.50	10.5	6	620525 7006	<b>48,30</b>

6132



## ATORN® Metal band saw blades, continuous



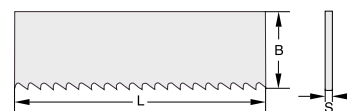
- Additional dimensions and toothing available on request



### Bi-metal band saw blades with combination teeth, continuous

- For machines, for example Heska, Amada, DoAll, Jaespa, Pehaka, Kaltenbach, Müller

- Particularly wear-resistant with a high degree of cutting precision
- For rust-proof and acid-proof steel in medium and large cross-sections
- For all steel grades up to 45 HRC
- For non-ferrous metals
- For all material diameters and contour cuts



L mm	B mm	S mm	Combination toothing per inch	Bi-metal M42 art.no.	€
1,325	13	0.65	6 / 10	620540 1306	16,10
1,325	13	0.65	8 / 12	620540 1308	16,10
1,325	13	0.65	10 / 14	620540 1310	16,10
2,362	20	0.90	5 / 8	620540 2305	27,20
2,362	20	0.90	6 / 10	620540 2306	27,20
2,362	20	0.90	8 / 12	620540 2308	27,20
2,750	27	0.90	3 / 4	620540 2703	31,30
2,750	27	0.90	4 / 6	620540 2704	31,30
2,750	27	0.90	6 / 10	620540 2706	31,30
2,750	27	0.90	10 / 14	620540 2710	31,30
2,835	27	0.90	3 / 4	620540 2803	32,20
2,835	27	0.90	4 / 6	620540 2804	32,20
2,835	27	0.90	6 / 10	620540 2806	32,20
2,835	27	0.90	10 / 14	620540 2810	32,20
3,150	27	0.90	3 / 4	620540 3103	35,40
3,150	27	0.90	4 / 6	620540 3104	35,40
3,150	27	0.90	6 / 10	620540 3106	35,40
3,150	27	0.90	10 / 14	620540 3110	35,40
3,660	27	0.90	3 / 4	620540 3604	39,70
3,660	27	0.90	5 / 8	620540 3606	39,70
3,660	27	0.90	6 / 10	620540 3608	39,70
3,660	27	0.90	8 / 12	620540 3610	39,70
3,660	27	0.90	10 / 14	620540 3614	39,70
3,830	27	0.90	3 / 4	620540 3803	41,70
3,830	27	0.90	4 / 6	620540 3804	41,70
3,830	27	0.90	6 / 10	620540 3806	41,70
3,830	27	0.90	10 / 14	620540 3810	41,70
4,150	27	0.90	4 / 6	620540 4104	44,50
4,150	27	0.90	6 / 10	620540 4106	44,50
4,150	27	0.90	10 / 14	620540 4110	44,50
4,100	34	1.10	2 / 3	620540 4123	56,50
4,100	34	1.10	3 / 4	620540 4134	56,50
4,100	34	1.10	4 / 6	620540 4146	56,50
4,100	34	1.10	5 / 8	620540 4158	56,50
4,640	34	1.10	2 / 3	620540 4623	64,60
4,640	34	1.10	3 / 4	620540 4634	64,60
4,640	34	1.10	4 / 6	620540 4646	64,60
4,640	34	1.10	5 / 8	620540 4658	64,60
4,115	41	1.30	2 / 3	620540 4112	73,30
4,115	41	1.30	3 / 4	620540 4113	73,30
4,115	41	1.30	4 / 6	620540 4114	73,30
4,115	41	1.30	5 / 8	620540 4115	73,30
4,570	41	1.30	2 / 3	620540 4523	82,40
4,570	41	1.30	3 / 4	620540 4534	82,40
4,570	41	1.30	4 / 6	620540 4546	82,40
4,570	41	1.30	5 / 8	620540 4558	82,40
5,800	41	1.30	2 / 3	620540 5823	103,-
5,800	41	1.30	3 / 4	620540 5834	103,-
5,800	41	1.30	4 / 6	620540 5846	103,-
5,800	41	1.30	5 / 8	620540 5858	103,-

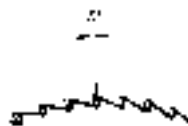
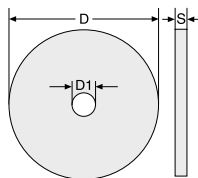
6132



# SARA® Metal circular saw blade

HSS
DIN 1837A
Typ N
*i* Vc/tz 746

- **Fine-toothed**
- **Double helical tooth, form A**, lateral bevel grinding (hollow-ground)
- Hole without keyway
- For fine slotting and end-to-end cutting work, for low-depth cutting or for thin-walled materials



Fine-toothed, Form A, double helical tooth, DIN 1840 (rake angle 5°)



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		25-45	15-25	10-15	7-15	7-15		25-45	25-30				120-400	120-400						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	S mm	D1 mm	Number of teeth	art.no.	€
20.0	0.2	5	80	200101 0001	18,95
20.0	0.25	5	64	200101 0002	18,95
20.0	0.3	5	64	200101 0003	18,95
20.0	0.4	5	64	200101 0004	18,95
20.0	0.5	5	48	200101 0005	17,05
20.0	0.6	5	48	200101 0006	17,05
20.0	0.8	5	48	200101 0007	17,05
20.0	1.0	5	40	200101 0008	17,05
20.0	1.2	5	40	200101 0009	18,25
20.0	1.6	5	40	200101 0010	20,10
20.0	2.0	5	32	200101 0011	21,-
20.0	2.5	5	32	200101 0012	23,40
20.0	3.0	5	32	200101 0013	30,20
20.0	4.0	5	24	200101 0014	30,20
20.0	5.0	5	24	200101 0015	34,30
20.0	6.0	5	24	200101 0016	46,50
25.0	0.2	8	80	200101 0017	19,35
25.0	0.25	8	80	200101 0018	19,35
25.0	0.3	8	80	200101 0019	19,35
25.0	0.4	8	64	200101 0020	19,35
25.0	0.5	8	64	200101 0021	17,70
25.0	0.6	8	64	200101 0022	17,70
25.0	0.8	8	48	200101 0023	17,70
25.0	1.0	8	48	200101 0024	17,70
25.0	1.2	8	48	200101 0025	20,10
25.0	1.6	8	40	200101 0026	21,50
25.0	2.0	8	40	200101 0027	23,-
25.0	2.5	8	40	200101 0028	25,90
25.0	3.0	8	32	200101 0029	31,30
25.0	4.0	8	32	200101 0030	32,30
25.0	5.0	8	32	200101 0031	37,50
25.0	6.0	8	24	200101 0032	42,20
32.0	0.2	8	100	200101 0033	21,50
32.0	0.25	8	100	200101 0034	21,50
32.0	0.3	8	80	200101 0035	21,50
32.0	0.4	8	80	200101 0036	21,50

2101

D mm	S mm	D1 mm	Number of teeth	art.no.	€
32.0	0.5	8	80	200101 0037	20,50
32.0	0.6	8	64	200101 0038	20,50
32.0	0.8	8	64	200101 0039	20,50
32.0	1.0	8	64	200101 0040	20,50
32.0	1.2	8	48	200101 0041	22,30
32.0	1.6	8	48	200101 0042	24,30
32.0	2.0	8	48	200101 0043	26,30
32.0	2.5	8	40	200101 0044	28,70
32.0	3.0	8	40	200101 0045	34,20
32.0	4.0	8	40	200101 0046	35,60
32.0	5.0	8	32	200101 0047	40,20
32.0	6.0	8	32	200101 0048	51,90
40.0	0.2	10	128	200101 0049	25,90
40.0	0.25	10	100	200101 0050	25,90
40.0	0.3	10	100	200101 0051	25,90
40.0	0.4	10	100	200101 0052	25,90
40.0	0.5	10	80	200101 0053	25,90
40.0	0.6	10	80	200101 0054	25,90
40.0	0.8	10	80	200101 0055	25,90
40.0	1.0	10	64	200101 0056	25,90
40.0	1.2	10	64	200101 0057	27,40
40.0	1.6	10	64	200101 0058	30,20
40.0	2.0	10	48	200101 0059	32,30
40.0	2.5	10	48	200101 0060	34,20
40.0	3.0	10	48	200101 0061	39,80
40.0	4.0	10	40	200101 0062	45,80
40.0	5.0	10	40	200101 0063	51,30
40.0	6.0	10	40	200101 0064	57,80
50.0	0.2	13	128	200101 0065	29,60
50.0	0.25	13	128	200101 0066	29,60
50.0	0.3	13	128	200101 0067	29,60
50.0	0.4	13	100	200101 0068	29,60
50.0	0.5	13	100	200101 0069	29,60
50.0	0.6	13	100	200101 0070	29,60
50.0	0.8	13	80	200101 0071	29,60
50.0	1.0	13	80	200101 0072	29,60

2101

D mm	S mm	D1 mm	Number of teeth	Number of teeth	
				art.no.	€
50.0	1.2	13	80	200101 0073	31,30
50.0	1.6	13	64	200101 0074	33,80
50.0	2.0	13	64	200101 0075	35,60
50.0	2.5	13	64	200101 0076	38,20
50.0	3.0	13	48	200101 0077	41,80
50.0	4.0	13	48	200101 0078	47,30
50.0	5.0	13	48	200101 0079	54,50
50.0	6.0	13	40	200101 0080	57,80
63.0	0.25	16	160	200101 0081	32,30
63.0	0.3	16	128	200101 0082	32,30
63.0	0.4	16	128	200101 0083	32,30
63.0	0.5	16	128	200101 0084	32,30
63.0	0.6	16	100	200101 0085	32,30
63.0	0.8	16	100	200101 0086	32,30
63.0	1.0	16	100	200101 0087	32,30
63.0	1.2	16	80	200101 0088	33,80
63.0	1.6	16	80	200101 0089	35,60
63.0	2.0	16	80	200101 0090	38,20
63.0	2.5	16	64	200101 0091	39,80
63.0	3.0	16	64	200101 0092	44,30
63.0	4.0	16	64	200101 0093	50,10
63.0	5.0	16	48	200101 0094	55,40
63.0	6.0	16	48	200101 0095	62,90
80.0	0.3	22	160	200101 0096	37,50
80.0	0.4	22	160	200101 0097	37,50
80.0	0.5	22	128	200101 0098	37,50
80.0	0.6	22	128	200101 0099	37,50
80.0	0.8	22	128	200101 0100	37,50
80.0	1.0	22	100	200101 0101	37,50
80.0	1.2	22	100	200101 0102	38,60
80.0	1.6	22	100	200101 0103	40,30
80.0	2.0	22	80	200101 0104	42,80
80.0	2.5	22	80	200101 0105	44,30
80.0	3.0	22	80	200101 0106	49,60
80.0	4.0	22	64	200101 0107	55,-
80.0	5.0	22	64	200101 0108	62,30
80.0	6.0	22	64	200101 0109	71,-
100.0	0.5	22	160	200101 0110	41,80
100.0	0.6	22	160	200101 0111	41,80

2101

D mm	S mm	D1 mm	Number of teeth	Number of teeth	
				art.no.	€
100.0	0.8	22	128	200101 0112	41,80
100.0	1.0	22	128	200101 0113	41,80
100.0	1.2	22	128	200101 0114	41,80
100.0	1.6	22	100	200101 0115	45,80
100.0	2.0	22	100	200101 0116	48,10
100.0	2.5	22	100	200101 0117	51,90
100.0	3.0	22	80	200101 0118	59,40
100.0	4.0	22	80	200101 0119	68,80
100.0	5.0	22	80	200101 0120	79,-
100.0	6.0	22	64	200101 0121	102,-
125.0	0.6	22	160	200101 0122	48,10
125.0	0.8	22	160	200101 0123	48,10
125.0	1.0	22	160	200101 0124	48,10
125.0	1.2	22	128	200101 0125	48,10
125.0	1.6	22	128	200101 0126	54,40
125.0	2.0	22	128	200101 0127	59,40
125.0	2.5	22	100	200101 0128	64,70
125.0	3.0	22	100	200101 0129	71,-
125.0	4.0	22	100	200101 0130	82,20
125.0	5.0	22	80	200101 0131	96,30
125.0	6.0	22	80	200101 0132	114,-
160.0	1.0	32	160	200101 0133	59,40
160.0	1.2	32	160	200101 0134	59,40
160.0	1.6	32	160	200101 0135	62,30
160.0	2.0	32	128	200101 0136	66,20
160.0	2.5	32	128	200101 0137	73,30
160.0	3.0	32	128	200101 0138	82,20
160.0	4.0	32	100	200101 0139	106,-
160.0	5.0	32	100	200101 0140	132,-
160.0	6.0	32	100	200101 0141	172,-
200.0	1.0	32	200	200101 0142	78,60
200.0	1.2	32	200	200101 0143	78,60
200.0	1.6	32	160	200101 0144	85,70
200.0	2.0	32	160	200101 0145	91,-
200.0	2.5	32	160	200101 0146	103,-
200.0	3.0	32	128	200101 0147	121,50
200.0	4.0	32	128	200101 0148	165,50
200.0	5.0	32	128	200101 0149	207,-
200.0	6.0	32	100	200101 0150	253,-

2101



## Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



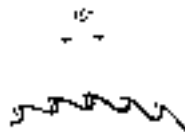
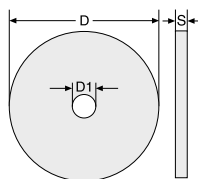
Register online now!

# www.saratools.com

# SARA® Metal circular saw blade

HSS
DIN 1838B
Typ N
*i* Vc/tz 746

- Coarse-toothed
- With curved tooth, form B, lateral bevel grinding (hollow-ground)
- Hole without keyway
- For coarse slotting and end-to-end cutting work, and for machining with large cutting depths and cross-sections up to max. 100 mm depending on dimensions, pitch, number of teeth and feed rate/cutting speed



Coarse-toothed, Form B, curved tooth, DIN 1840 (rake angle 15°)



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		25-45	15-25	10-15	7-15	7-15		25-45	25-30				120-400	120-400						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	S mm	D1 mm	Number of teeth	art.no.	€
50.0	0.5	13	48	200105 0001	29,60
50.0	0.6	13	48	200105 0002	29,60
50.0	0.8	13	40	200105 0003	29,60
50.0	1.0	13	40	200105 0004	29,60
50.0	1.2	13	40	200105 0005	31,30
50.0	1.6	13	32	200105 0006	33,80
50.0	2.0	13	32	200105 0007	35,60
50.0	2.5	13	32	200105 0008	38,20
50.0	3.0	13	24	200105 0009	41,80
50.0	4.0	13	24	200105 0010	46,10
50.0	5.0	13	24	200105 0011	54,50
50.0	6.0	13	20	200105 0012	60,70
63.0	0.5	16	64	200105 0013	32,30
63.0	0.6	16	48	200105 0014	32,30
63.0	0.8	16	48	200105 0015	32,30
63.0	1.0	16	48	200105 0016	32,30
63.0	1.2	16	40	200105 0017	33,80
63.0	1.6	16	40	200105 0018	35,60
63.0	2.0	16	40	200105 0019	38,20
63.0	2.5	16	32	200105 0020	39,80
63.0	3.0	16	32	200105 0021	44,30
63.0	4.0	16	32	200105 0022	50,10
63.0	5.0	16	24	200105 0023	55,40
63.0	6.0	16	24	200105 0024	62,90
80.0	0.5	22	64	200105 0025	37,50
80.0	0.6	22	64	200105 0026	37,50
80.0	0.8	22	64	200105 0027	37,50
80.0	1.0	22	48	200105 0028	37,50
80.0	1.2	22	48	200105 0029	38,60
80.0	1.6	22	48	200105 0030	40,30
80.0	2.0	22	40	200105 0031	42,80
80.0	2.5	22	40	200105 0032	44,30
80.0	3.0	22	40	200105 0033	49,60
80.0	4.0	22	32	200105 0034	55,-
80.0	5.0	22	32	200105 0035	62,30
80.0	6.0	22	32	200105 0036	71,-
100.0	0.6	22	80	200105 0037	41,80
100.0	0.8	22	64	200105 0038	41,80
100.0	1.0	22	64	200105 0039	41,80
100.0	1.2	22	64	200105 0040	41,80
100.0	1.6	22	48	200105 0041	45,80

2101

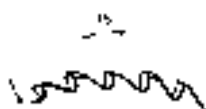
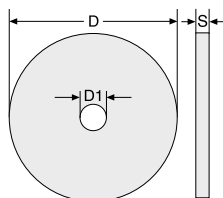
D mm	S mm	D1 mm	Number of teeth	art.no.	€
100.0	2.0	22	48	200105 0042	48,10
100.0	2.5	22	48	200105 0043	51,90
100.0	3.0	22	40	200105 0044	59,40
100.0	4.0	22	40	200105 0045	68,80
100.0	5.0	22	40	200105 0046	79,-
100.0	6.0	22	32	200105 0047	102,-
125.0	0.8	22	80	200105 0048	48,10
125.0	1.0	22	80	200105 0049	48,10
125.0	1.2	22	64	200105 0050	48,10
125.0	1.6	22	64	200105 0051	54,40
125.0	2.0	22	64	200105 0052	59,40
125.0	2.5	22	48	200105 0053	64,70
125.0	3.0	22	48	200105 0054	71,-
125.0	4.0	22	48	200105 0055	82,20
125.0	5.0	22	40	200105 0056	96,30
125.0	6.0	22	40	200105 0057	114,-
160.0	1.0	32	80	200105 0058	59,40
160.0	1.2	32	80	200105 0059	59,40
160.0	1.6	32	80	200105 0060	62,30
160.0	2.0	32	64	200105 0061	66,20
160.0	2.5	32	64	200105 0062	73,30
160.0	3.0	32	64	200105 0063	82,20
160.0	4.0	32	48	200105 0064	106,-
160.0	5.0	32	48	200105 0065	140,50
160.0	6.0	32	48	200105 0066	164,-
200.0	1.0	32	100	200105 0067	78,60
200.0	1.2	32	100	200105 0068	78,60
200.0	1.6	32	80	200105 0069	83,-
200.0	2.0	32	80	200105 0070	91,-
200.0	2.5	32	80	200105 0071	103,-
200.0	3.0	32	64	200105 0072	121,50
200.0	4.0	32	64	200105 0073	165,50
200.0	5.0	32	64	200105 0074	207,-
200.0	6.0	32	48	200105 0075	253,-
250.0	1.6	32	100	200105 0076	133,50
250.0	2.0	32	100	200105 0077	146,50
250.0	2.5	32	80	200105 0078	167,-
250.0	3.0	32	80	200105 0079	184,50
250.0	4.0	32	80	200105 0080	265,-
250.0	5.0	32	64	200105 0081	316,-
250.0	6.0	32	64	200105 0082	380,-

2101

# SARA® Metal circular saw blade

HSS
DIN 1838C
Typ N
*i* Vc/tz 746

- Coarse-toothed
- Curved toothing with lead and raker teeth (HZ toothing)
- Lateral bevel grinding (hollow grinding), bore hole without keyway
- This tooth form is primarily used for end-to-end cutting as the raised lead tooth makes it impossible to achieve a straight finish at the base of the cut with non-continuous cutting or milling. Otherwise, these blades can be used as specified in DIN 1838 B.



Coarse-toothed/HZ, Form C, curved tooth, DIN 1840 (rake angle 15°)



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		25-45	15-25	10-15	7-15	7-15		25-45	25-30				120-400	120-400					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	S mm	D1 mm	Number of teeth	art.no.	€
50.0	1.0	13	40	200110 0001	36,60
50.0	1.2	13	40	200110 0002	37,10
50.0	1.6	13	32	200110 0003	40,30
50.0	2.0	13	32	200110 0004	42,80
50.0	2.5	13	32	200110 0005	42,70
50.0	4.0	13	24	200110 0007	51,30
50.0	5.0	13	24	200110 0008	61,60
50.0	6.0	13	20	200110 0009	65,70
63.0	1.0	16	48	200110 0010	39,30
63.0	1.2	16	40	200110 0011	40,30
63.0	1.6	16	40	200110 0012	42,80
63.0	2.0	16	40	200110 0013	44,30
63.0	2.5	16	32	200110 0014	42,70
63.0	3.0	16	32	200110 0015	47,80
63.0	4.0	16	32	200110 0016	56,80
63.0	5.0	16	24	200110 0017	58,-
63.0	6.0	16	24	200110 0018	65,70
80.0	1.0	22	48	200110 0019	45,80
80.0	1.2	22	48	200110 0020	46,50
80.0	1.6	22	48	200110 0021	49,60
80.0	2.0	22	40	200110 0022	51,30
80.0	2.5	22	40	200110 0023	51,30
80.0	3.0	22	40	200110 0024	56,80
80.0	4.0	22	32	200110 0025	61,30
80.0	5.0	22	32	200110 0026	68,40
80.0	6.0	22	32	200110 0027	76,30
100.0	1.0	22	64	200110 0028	51,30
100.0	1.2	22	64	200110 0029	51,30
100.0	1.6	22	48	200110 0030	55,40
100.0	2.0	22	48	200110 0031	57,80
100.0	2.5	22	48	200110 0032	61,30
100.0	3.0	22	40	200110 0033	68,80
100.0	4.0	22	40	200110 0034	79,-
100.0	5.0	22	40	200110 0035	86,70

2101

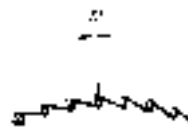
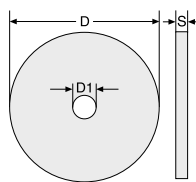
D mm	S mm	D1 mm	Number of teeth	art.no.	€
100.0	6.0	22	32	200110 0036	109,-
125.0	1.0	22	80	200110 0037	59,40
125.0	1.2	22	64	200110 0038	59,40
125.0	1.6	22	64	200110 0039	64,70
125.0	2.0	22	64	200110 0040	71,-
125.0	2.5	22	48	200110 0041	76,70
125.0	3.0	22	48	200110 0042	82,20
125.0	4.0	22	48	200110 0043	93,-
125.0	5.0	22	40	200110 0044	104,-
125.0	6.0	22	40	200110 0045	122,-
160.0	1.0	32	80	200110 0046	69,40
160.0	1.2	32	80	200110 0047	71,90
160.0	1.6	32	80	200110 0048	74,30
160.0	2.0	32	64	200110 0049	79,-
160.0	2.5	32	64	200110 0050	85,70
160.0	3.0	32	64	200110 0051	95,-
160.0	4.0	32	48	200110 0052	119,50
160.0	5.0	32	48	200110 0053	147,-
160.0	6.0	32	48	200110 0054	176,50
200.0	1.2	32	100	200110 0056	91,-
200.0	1.6	32	80	200110 0057	101,-
200.0	2.0	32	80	200110 0058	106,-
200.0	2.5	32	80	200110 0059	118,-
200.0	3.0	32	64	200110 0060	138,50
200.0	4.0	32	64	200110 0061	180,-
200.0	5.0	32	64	200110 0062	214,-
200.0	6.0	32	48	200110 0063	253,-
250.0	1.6	32	100	200110 0064	141,50
250.0	2.0	32	100	200110 0065	156,-
250.0	2.5	32	80	200110 0066	176,-
250.0	3.0	32	80	200110 0067	194,50
250.0	4.0	32	80	200110 0068	280,-
250.0	5.0	32	64	200110 0069	331,-
250.0	6.0	32	64	200110 0070	390,-

2101

# SARA® Solid carbide circular saw blade



- **Fine-toothed**
- **Double helical tooth, form A**, lateral bevel grinding (hollow-ground)
- Hole without keyway
- For fine slotting and end-to-end cutting work, for low-depth cutting or for thin-walled materials



Fine-toothed, Form A, double helical tooth, DIN 1840 (rake angle 5°)



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 8 % Si	> 8 % Si	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRF/EP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		100-150	80-120		60-80	60-80	40-60	80-100	60-80	40-60				800-1000	800-1000	200-300				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	S mm	D1 mm	Number of teeth	art.no.	€
20	0.25	5	64	202001 0033	18,15
20	0.3	5	64	202001 0034	18,55
20	0.5	5	48	202001 0037	20,30
20	0.6	5	48	202001 0038	21,-
20	1.0	5	40	202001 0042	27,70
20	1.6	5	40	202001 0048	36,-
25	0.2	8	80	202001 0061	19,85
25	0.3	8	80	202001 0063	18,45
25	0.4	8	64	202001 0065	21,-
25	0.5	8	64	202001 0066	21,-
25	0.6	8	64	202001 0067	21,60
25	0.7	8	48	202001 0068	26,40
25	1.0	8	48	202001 0071	27,50
25	1.2	8	40	202001 0073	30,30
25	1.6	8	40	202001 0077	39,80
25	2.0	8	40	202001 0081	46,20
30	0.25	8	100	202001 0091	23,30
30	0.3	8	80	202001 0092	21,50
30	0.4	8	80	202001 0094	21,50
30	0.5	8	80	202001 0095	22,10
30	0.6	8	64	202001 0096	25,20
30	0.8	8	64	202001 0098	28,50
30	1.0	8	64	202001 0100	31,-
30	1.2	8	48	202001 0102	35,10
30	1.6	8	48	202001 0106	44,10
30	2.0	8	48	202001 0110	50,20
30	2.5	8	40	202001 0111	60,60
40	0.4	10	100	202001 0123	29,40
40	0.5	10	80	202001 0124	30,80
40	0.6	10	80	202001 0125	32,30
40	0.8	10	80	202001 0127	35,80
40	1.0	10	64	202001 0129	39,10
40	1.2	10	64	202001 0131	44,10
40	1.6	10	64	202001 0135	53,10
40	2.0	10	48	202001 0139	56,-
40	2.5	10	48	202001 0140	65,60
40	3.0	10	48	202001 0141	77,90
50	0.5	13	100	202001 0151	39,-
50	0.6	13	100	202001 0152	39,80
50	0.8	13	80	202001 0154	43,20
50	1.0	13	80	202001 0156	48,-

2142

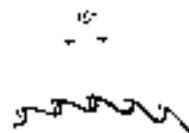
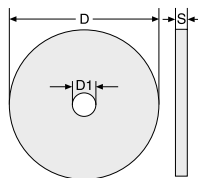
D mm	S mm	D1 mm	Number of teeth	art.no.	€
50	1.2	13	80	202001 0158	51,30
50	1.6	13	64	202001 0162	67,40
50	2.0	13	64	202001 0166	71,20
50	2.5	13	64	202001 0167	87,-
50	3.0	13	48	202001 0168	96,30
63	0.3	16	128	202001 0175	56,-
63	0.4	16	128	202001 0177	54,50
63	0.5	16	128	202001 0178	53,10
63	0.6	16	100	202001 0179	53,40
63	0.8	16	100	202001 0181	59,40
63	1.0	16	100	202001 0183	63,10
63	1.2	16	80	202001 0185	69,70
63	1.6	16	80	202001 0189	81,90
63	2.0	16	80	202001 0193	90,10
63	2.5	16	64	202001 0194	102,50
63	3.0	16	64	202001 0195	114,-
80	0.5	22	128	202001 0203	77,50
80	0.6	22	128	202001 0204	79,-
80	0.8	22	128	202001 0206	80,-
80	1.0	22	100	202001 0208	84,-
80	1.2	22	100	202001 0210	90,10
80	1.6	22	100	202001 0214	100,50
80	2.0	22	80	202001 0218	126,-
80	2.5	22	80	202001 0219	143,-
80	3.0	22	80	202001 0220	167,-
100	0.6	22	160	202001 0226	116,-
100	0.8	22	128	202001 0228	114,-
100	1.0	22	128	202001 0230	122,-
100	1.2	22	128	202001 0232	128,50
100	1.6	22	100	202001 0236	159,-
100	2.0	22	100	202001 0240	176,-
100	3.0	22	80	202001 0242	244,-
125	0.8	22	160	202001 0249	181,50
125	1.0	22	160	202001 0251	194,50
125	1.2	22	128	202001 0253	213,-
125	1.6	22	128	202001 0257	255,-
125	2.0	22	128	202001 0261	255,-
125	3.0	22	100	202001 0263	370,-
160	1.0	32	160	202001 0268	405,-
160	2.5	32	128	202001 0273	649,-
160	3.0	32	128	202001 0274	709,-

2142

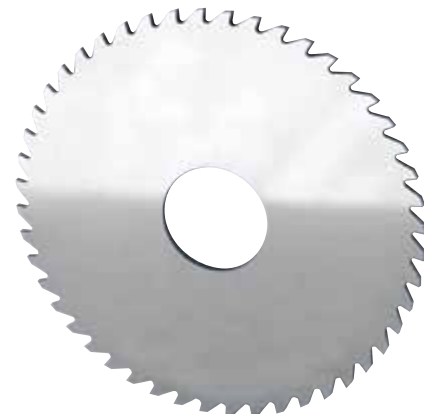
# SARA® Solid carbide circular saw blade

**VHM** **DIN 1838** **i** **Vc/fz** **747**

- **Coarse-toothed**
- **With curved tooth, form B**, lateral bevel grinding (hollow-ground)
- Hole without keyway
- For coarse slotting and end-to-end cutting work, and for machining with large cutting depths and cross-sections up to max. 100 mm depending on dimensions, pitch, number of teeth and feed rate/cutting speed



Coarse-toothed, Form B, curved tooth, DIN 1840 (rake angle 15°)



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		<30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		100-150	80-120		60-80	60-80	40-60	80-100	60-80	40-60			800-1000	800-1000	200-300				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	S mm	D1 mm	Number of teeth	art.no.	€
20	0.25	5	20	202002 0022	18,15
20	0.3	5	20	202002 0023	18,55
20	0.5	5	20	202002 0025	20,30
20	0.6	5	20	202002 0026	21,-
20	1.0	5	20	202002 0030	27,70
20	1.6	5	20	202002 0033	36,-
25	0.2	8	20	202002 0041	19,85
25	0.5	8	20	202002 0045	21,-
25	0.6	8	20	202002 0046	21,60
25	0.8	8	20	202002 0048	25,10
25	1.0	8	20	202002 0050	27,50
25	1.2	8	20	202002 0051	30,30
25	1.6	8	20	202002 0053	39,80
25	2.0	8	20	202002 0055	46,20
30	0.4	8	30	202002 0064	21,50
30	0.5	8	30	202002 0065	22,10
30	0.6	8	30	202002 0066	25,20
30	0.8	8	24	202002 0068	28,50
30	1.0	8	24	202002 0070	31,-
30	1.2	8	24	202002 0071	35,10
30	1.6	8	24	202002 0073	44,10
30	2.0	8	24	202002 0075	50,20
30	2.5	8	24	202002 0076	60,60
40	0.4	10	40	202002 0084	29,40
40	0.5	10	40	202002 0085	30,80
40	0.6	10	40	202002 0086	32,30
40	0.8	10	32	202002 0088	35,80
40	1.0	10	32	202002 0090	39,10
40	1.2	10	32	202002 0091	44,10
40	1.6	10	32	202002 0093	53,10
40	2.0	10	32	202002 0095	56,-
40	2.5	10	32	202002 0096	65,60
40	3.0	10	32	202002 0097	77,90
50	0.5	13	48	202002 0102	39,-
50	0.6	13	48	202002 0103	39,80
50	0.8	13	40	202002 0105	43,20
50	1.0	13	40	202002 0107	48,-

D mm	S mm	D1 mm	Number of teeth	art.no.	€
50	1.2	13	40	202002 0108	51,30
50	1.6	13	32	202002 0110	67,40
50	2.0	13	32	202002 0112	71,20
50	2.5	13	32	202002 0113	87,-
50	3.0	13	24	202002 0114	96,30
63	0.5	16	64	202002 0119	53,10
63	0.6	16	48	202002 0120	53,40
63	0.8	16	48	202002 0122	59,40
63	1.0	16	48	202002 0124	63,10
63	1.2	16	40	202002 0125	69,70
63	1.6	16	40	202002 0127	81,90
63	2.0	16	40	202002 0129	90,10
63	2.5	16	32	202002 0130	102,50
63	3.0	16	32	202002 0131	114,-
80	0.6	22	64	202002 0135	79,-
80	0.8	22	64	202002 0137	80,-
80	1.0	22	48	202002 0139	84,-
80	1.2	22	48	202002 0140	90,10
80	1.6	22	48	202002 0142	100,50
80	2.0	22	40	202002 0144	126,-
80	2.5	22	40	202002 0145	143,-
80	3.0	22	40	202002 0146	167,-
100	0.6	22	80	202002 0150	116,-
100	0.8	22	64	202002 0152	114,-
100	1.0	22	64	202002 0154	122,-
100	1.2	22	64	202002 0155	128,50
100	1.6	22	48	202002 0157	159,-
100	2.0	22	48	202002 0159	176,-
100	3.0	22	40	202002 0161	244,-
125	0.8	22	80	202002 0165	181,50
125	1.0	22	80	202002 0167	194,50
125	1.2	22	64	202002 0168	213,-
125	1.6	22	64	202002 0170	255,-
125	2.0	22	64	202002 0172	255,-
125	2.5	22	48	202002 0173	314,-
125	3.0	22	48	202002 0174	370,-

2142

2142



# SARA® Metal circular saw blade, precision version

HSS
HSS-E
*i*  
Vc/tz
748

- Precision version for use on slow-running circular saw machines or cold circular saws from various manufacturers (ADIGE, EISELE, BERG&SCHMID, IBP, THOMAS, MEP, KALTENBACH, TRENNJÄGER, HÄBERLE etc.)
- Steam-treated surface to prevent material welding, enhance coolant absorption and increase wear resistance
- **Quantity and dimensions of driving pin holes: (quantity / bore hole Ø / pitch circle Ø)**

### Usage recommendation for

#### tooth pitch t: 3 + 4

tooth form BW = profiles and pipes, wall thickness 1.0-2.0 mm  
approx. 40-60 rpm depending on diameter

#### tooth pitch t: 5

tooth form BW = profiles and pipes, wall thickness 2.0-3.0 mm  
approx. 40-60 rpm depending on diameter  
solid material, cross section 10-20 mm,  
approx. 20-40 rpm depending on diameter

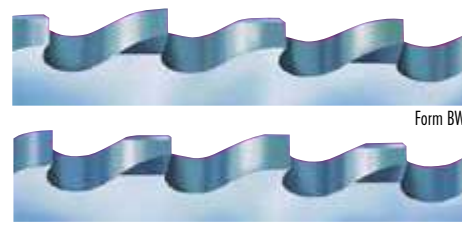
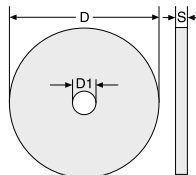
#### tooth pitch t: 6 + 8

tooth form HZ = solid material, cross section 20-40 mm  
approx. 20-40 rpm depending on diameter

#### tooth pitch t: 10

tooth form HZ = solid material, cross section 40-60 mm  
approx. 20-40 rpm depending on diameter

**Note:** Please ensure that the saw blade is undamaged, that it has been mounted correctly, that there is sufficient cooling, that the blade is engaged correctly and that workpieces are properly secured to prevent slippage. Failure to do so puts the saw blade at risk of breaking!



Form BW

Form HZ

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-dilloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
		35-45	20-35	10-20	10-18	10-18	10-15	20-35	20-35				200-300	200-300	30-45				

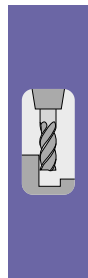
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	S mm	D1 mm	Tooth pitch	Number of teeth	Tooth form	Follower drill holes	HSS		HSS Co5	
							art.no.	€	art.no.	€
225.0	2.0	32	4	180	BW		<b>200150 0104</b>	85,-	<b>200151 0104</b>	117,-
225.0	2.0	32	6	120	HZ	2/8/45 + 2/11/63 + 4/9/50	200150 0106	85,-	200151 0106	117,-
225.0	2.0	32	8	90	HZ		200150 0108	85,-	200151 0108	117,-
225.0	2.0	40	4	180	BW		200150 0204	85,-	200151 0204	117,-
225.0	2.0	40	6	120	HZ	2/8/55 + 4/12/64	200150 0206	85,-	200151 0206	117,-
225.0	2.0	40	8	90	HZ		200150 0208	85,-	200151 0208	117,-
250.0	2.0	32	4	200	BW		200150 0304	99,70	200151 0304	141,50
250.0	2.0	32	5	160	BW	2/8/45 + 2/11/63 + 4/9/50	200150 0305	99,70	200151 0305	141,50
250.0	2.0	32	6	128	HZ		200150 0306	99,70	200151 0306	141,50
250.0	2.0	32	8	100	HZ		200150 0308	99,70	200151 0308	141,50
250.0	2.0	40	4	200	BW		200150 0404	99,70	200151 0404	141,50
250.0	2.0	40	5	160	BW	2/8/55 + 4/12/64	200150 0405	99,70	200151 0405	141,50
250.0	2.0	40	6	128	HZ		200150 0406	99,70	200151 0406	141,50
250.0	2.0	40	8	100	HZ		200150 0408	99,70	200151 0408	141,50
275.0	2.5	32	4	220	BW		200150 0504	99,70	200151 0504	156,-
275.0	2.5	32	5	180	BW	2/8/45 + 2/11/63 + 4/9/50	200150 0505	99,70	200151 0505	156,-
275.0	2.5	32	6	140	HZ		200150 0506	99,70	200151 0506	156,-
275.0	2.5	32	8	110	HZ		200150 0508	99,70	200151 0508	156,-
275.0	2.5	32	10	90	HZ		200150 0510	99,70	200151 0510	156,-
275.0	2.5	40	4	220	BW		200150 0604	99,70	200151 0604	156,-
275.0	2.5	40	5	180	BW	2/8/55 + 4/12/64	200150 0605	99,70	200151 0605	156,-
275.0	2.5	40	6	140	HZ		200150 0606	99,70	200151 0606	156,-
275.0	2.5	40	8	110	HZ		200150 0608	99,70	200151 0608	156,-
275.0	2.5	40	10	84	HZ		200150 0610	99,70	200151 0610	156,-
300.0	2.5	32	4	240	BW		200150 0704	145,-	200151 0704	229,-
300.0	2.5	32	6	160	HZ	2/8/45 + 2/11/63 + 4/9/50	200150 0706	145,-	200151 0706	229,-
300.0	2.5	32	8	120	HZ		200150 0708	145,-	200151 0708	229,-

2102

2102

D mm	S mm	D1 mm	Tooth pitch	Number of teeth	Tooth form	Follower drill holes	HSS		HSS Co5	
							art.no.	€	art.no.	€
300.0	2.5	40	4	240	BW	2/8/55 + 4/12/64	200150 0804	145,-	200151 0804	229,-
300.0	2.5	40	6	160	HZ		200150 0806	145,-	200151 0806	229,-
300.0	2.5	40	8	120	HZ		200150 0808	145,-	200151 0808	229,-
315.0	2.5	32	4	250	BW	2/8/45 + 2/11/63 + 4/9/50	200150 0904	158,-	200151 0904	239,-
315.0	2.5	32	5	200	BW		200150 0905	158,-	200151 0905	239,-
315.0	2.5	32	6	160	HZ		200150 0906	158,-	200151 0906	239,-
315.0	2.5	32	8	120	HZ		200150 0908	158,-	200151 0908	239,-
315.0	2.5	32	10	100	HZ		200150 0910	158,-	200151 0910	239,-
315.0	2.5	40	4	250	BW		200150 1004	158,-	200151 1004	239,-
315.0	2.5	40	5	200	HZ	2/8/55 + 4/12/64	200150 1005	158,-	200151 1005	239,-
315.0	2.5	40	6	160	HZ		200150 1006	158,-	200151 1006	239,-
315.0	2.5	40	8	120	HZ		200150 1008	158,-	200151 1008	239,-
315.0	2.5	40	10	100	HZ		200150 1010	158,-	200151 1010	239,-
315.0	3.0	32	4	250	BW		2/8/45 + 2/11/63 + 4/9/50	200150 1104	194,50	200151 1104
315.0	3.0	32	5	200	BW	200150 1105		194,50	200151 1105	257,-
315.0	3.0	32	6	160	HZ	200150 1106		194,50	200151 1106	257,-
315.0	3.0	32	8	120	HZ	200150 1108		194,50	200151 1108	257,-
315.0	3.0	32	10	100	HZ	200150 1110		194,50	200151 1110	257,-
315.0	3.0	40	4	250	BW	2/8/55 + 4/12/64		200150 1204	194,50	200151 1204
315.0	3.0	40	5	200	BW		200150 1205	194,50	200151 1205	257,-
315.0	3.0	40	6	160	HZ		200150 1206	194,50	200151 1206	257,-
315.0	3.0	40	8	120	HZ		200150 1208	194,50	200151 1208	257,-
315.0	3.0	40	10	100	HZ		200150 1210	194,50	200151 1210	257,-
350.0	3.0	32	5	220	BW	2/8/45 + 2/11/63	200150 1305	231,-	200151 1305	310,-
350.0	3.0	32	6	180	HZ		200150 1306	231,-	200151 1306	310,-
350.0	3.0	32	7	160	HZ		200150 1307	231,-	200151 1307	310,-
350.0	3.0	32	8	140	HZ		200150 1308	231,-	200151 1308	310,-
350.0	3.0	32	10	110	HZ		200150 1310	231,-	200151 1310	310,-
350.0	3.0	40	5	220	BW	2/8/55 + 4/12/64	200150 1405	231,-	200151 1405	310,-
350.0	3.0	40	6	180	HZ		200150 1406	231,-	200151 1406	310,-
350.0	3.0	40	7	160	HZ		200150 1407	231,-	200151 1407	310,-
350.0	3.0	40	8	140	HZ		200150 1408	231,-	200151 1408	310,-
350.0	3.0	40	10	110	HZ		200150 1410	231,-	200151 1410	310,-
370.0	3.0	50	7	160	HZ	4/15/80 + 4/14/85	200150 1507	301,-	200151 1507	390,-
370.0	3.0	50	9	120	HZ		200150 1509	301,-	200151 1509	390,-
370.0	3.0	50	11	100	HZ		200150 1512	301,-	200151 1512	390,-
400.0	3.0	50	6	200	HZ		200150 1606	360,-	200151 1606	480,-
400.0	3.0	50	8	160	HZ		200150 1608	360,-	200151 1608	480,-
400.0	3.0	50	10	120	HZ		200150 1610	360,-	200151 1610	480,-
400.0	3.0	50	12	100	HZ	200150 1612	360,-	200151 1612	480,-	
							2102		2102	




OPTIMAL SOLUTIONS FOR

# GRINDING AND CUTTING



**PFERD**



**PFERD**  
Grinding and cutting  
763 pages  
Art.no. 019900 0216

Overview of all free manufacturers' catalogues  
on page 16/17

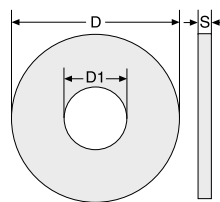
## SARA® Disc milling cutters

HSS-E

DIN 1834

Typ N

- **Narrow version**
- **3 cutting edges**
- Type N, cross-cut tothing
- Bore with longitudinal groove in accordance with DIN 138
- Smooth cut thanks to helical tothing
- Optimum chip removal with spacious chip chambers
- Milling cutters are self-freeing to prevent jamming



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		20-27	15-22	10-15	5-12	5-12	5-10	20-25	20-25				100-200	100-200	30-50					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D js16 mm	S k11 mm	D1 H7 mm	Number of teeth	art.no.	€
63	1.6	22	28	210105 0001	84,-
63	2.0	22	28	210105 0002	76,80
63	2.5	22	28	210105 0003	78,40
63	3.0	22	28	210105 0004	76,80
63	4.0	22	28	210105 0005	79,90
63	5.0	22	28	210105 0006	84,-
80	1.6	27	32	210105 0007	92,60
80	2.0	27	32	210105 0008	90,10
80	2.5	27	32	210105 0009	91,60
80	3.0	27	32	210105 0010	89,50
80	4.0	27	32	210105 0011	84,-
80	5.0	27	32	210105 0012	103,-
80	6.0	27	32	210105 0013	110,-
100	1.6	32	36	210105 0014	111,-
100	2.0	32	36	210105 0015	110,-
100	2.5	32	36	210105 0016	110,-
100	3.0	32	36	210105 0017	107,-
100	4.0	32	36	210105 0018	110,-
100	5.0	32	36	210105 0019	116,-
100	6.0	32	36	210105 0020	130,50
125	1.6	32	40	210105 0022	140,50

2103

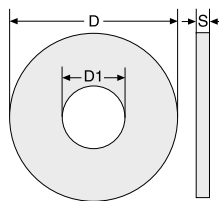
D js16 mm	S k11 mm	D1 H7 mm	Number of teeth	art.no.	€
125	2.0	32	40	210105 0023	134,50
125	2.5	32	40	210105 0024	138,50
125	3.0	32	40	210105 0025	141,50
125	4.0	32	40	210105 0026	137,50
125	5.0	32	40	210105 0027	146,50
125	6.0	32	40	210105 0028	158,-
125	8.0	32	32	210105 0029	196,50
125	10.0	32	32	210105 0030	219,-
160	2.0	40	48	210105 0031	219,-
160	3.0	40	48	210105 0033	214,-
160	4.0	40	48	210105 0034	204,-
160	5.0	40	48	210105 0035	219,-
160	6.0	40	48	210105 0036	234,-
160	8.0	40	36	210105 0037	265,-
160	10.0	40	36	210105 0038	285,-
200	2.5	40	52	210105 0040	306,-
200	3.0	40	52	210105 0041	290,-
200	4.0	40	52	210105 0042	295,-
200	6.0	40	52	210105 0044	331,-
200	10.0	40	40	210105 0046	430,-

2103

## SARA® Disc milling cutters

**HSS-E** **DIN 885** **Typ N**

- Type N, cross-cut tothing
- Bore with longitudinal groove in accordance with DIN 138
- Helix angle up to Ø 100 mm = 12°, from Ø 125 mm = 15°
- 3 cutting edges
- Milling cutters are self-freeing to prevent jamming



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		20-27	15-22	10-15	5-12	5-12	5-10	20-25	20-25				100-200	100-200						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D js16 mm	S k11 mm	D1 H7 mm	Number of teeth	art.no.	€
63	4	22	12	210115 0006	81,40
63	5	22	12	210115 0007	86,50
63	6	22	12	210115 0008	85,-
63	8	22	12	210115 0009	94,10
63	10	22	12	210115 0010	106,-
63	14	22	12	210115 0012	135,50
80	5	27	14	210115 0015	110,-
80	6	27	14	210115 0016	111,-
80	8	27	14	210115 0017	119,-
80	10	27	14	210115 0018	123,50
80	12	27	14	210115 0019	137,50
80	14	27	14	210115 0020	158,-
80	16	27	14	210115 0021	171,-
100	6	32	14	210115 0024	156,-

D js16 mm	S k11 mm	D1 H7 mm	Number of teeth	art.no.	€
100	8	32	14	210115 0025	159,-
100	10	32	14	210115 0026	170,-
100	12	32	14	210115 0027	183,50
100	14	32	14	210115 0028	204,-
100	16	32	14	210115 0029	219,-
125	8	32	16	210115 0034	209,-
125	10	32	16	210115 0035	229,-
125	12	32	16	210115 0036	245,-
125	14	32	16	210115 0037	275,-
125	16	32	16	210115 0038	290,-
125	20	32	16	210115 0040	336,-
160	8	40	18	210115 0044	311,-
160	10	40	18	210115 0045	331,-

2103

2103

## SARA® Shell end mills

**HSS-E** **DIN 841** **Typ N** **NR** **30°** **Vc/tz 749**

- With longitudinal and transverse grooves in accordance with DIN 138
- Right-hand cutting, right-hand twist = 30°
- Profile relief grinding



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		25-30	20-25	15-20	10-20	10-20	10-15	20-30	20-30				100-180	100-150	40-60					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	S mm	D1 mm	Number of teeth	Type N, finishing	art.no.	€
30.0	30	13	6	210530 0001	82,40	
35.0	35	16	6	210530 0002	90,60	
40.0	20	16	8	210530 0003	82,40	
40.0	40	16	8	210530 0004	107,-	
50.0	50	22	8	210530 0005	161,-	
60.0	60	27	8	210530 0006	224,-	
75.0	75	27	10	210530 0007	375,-	

2104

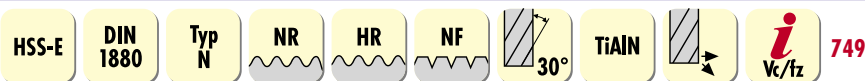


D mm	S mm	D1 mm	Number of teeth	Type NR, roughing	art.no.	€
40.0	40	16	6	210540 0004	132,50	
50.0	50	22	6	210540 0005	180,50	
60.0	60	27	8	210540 0006	239,-	
75.0	75	27	8	210540 0007	430,-	

2104



## SARA® Shell end mills



- With longitudinal and transverse grooves in accordance with DIN 138
- Right-hand cutting, right-hand twist = 30°
- Profile relief grinding

**Type N:** Finishing version

**Type NR:** Knuckle-type tooth profile for roughing work, chip separator with round profile, designed for large machining volumes

**Type HR:** Knuckle-type tooth profile for roughing work, chip separator with fine round profile, designed for high-strength materials

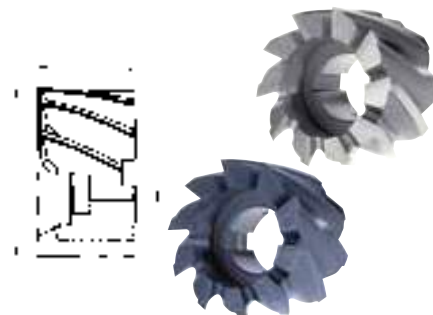
**Type NF:** Roughing / finishing toothing, chip separator with flat profile, for medium surface finish quality

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	40-60	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc
		25-30	20-25	15-20	10-20	10-20	10-15	20-30	20-30			100-180	100-150	40-60				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

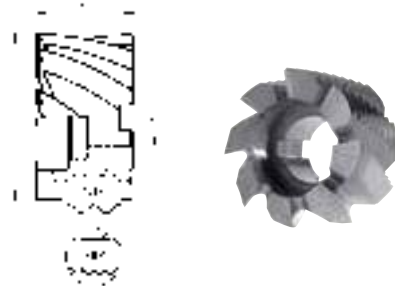
### Type N, finishing version

D mm	S mm	D1 mm	Number of teeth	art.no.	€	TiAlN art.no.	€
40.0	32	16	6	210501 0040	88,-	210506 0040	147,50
50.0	36	22	8	210501 0050	124,50	210506 0050	157,-
63.0	40	27	8	210501 0063	189,50	210506 0063	265,-
80.0	45	27	10	210501 0080	275,-	210506 0080	399,-
100.0	50	32	10	210501 0100	415,-		
				2104		2104	



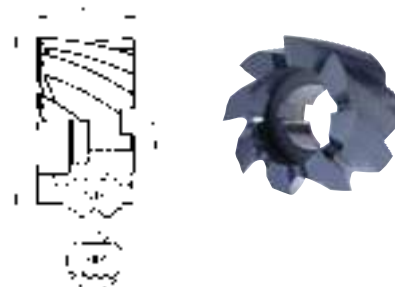
### Type NR, roughing version

D mm	S mm	D1 mm	Number of teeth	art.no.	€
40.0	32	16	6	210520 0040	105,-
50.0	36	22	6	210520 0050	142,50
63.0	40	27	8	210520 0063	209,-
80.0	45	27	8	210520 0080	306,-
100.0	50	32	10	210520 0100	465,-
				2104	



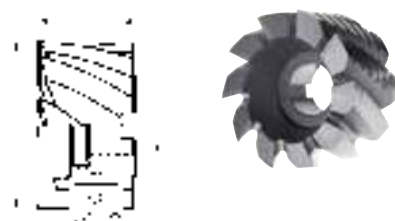
### Type HR, roughing version

D mm	S mm	D1 mm	Number of teeth	art.no.	€
40.0	32	16	8	210523 0040	160,-
50.0	36	22	8	210523 0050	209,-
63.0	40	27	10	210523 0063	285,-
80.0	45	27	10	210523 0080	435,-
100.0	50	32	12	210523 0100	649,-
				2104	



### Type NF, roughing / finishing version

D mm	S mm	D1 mm	Number of teeth	art.no.	€
40.0	32	16	6	210525 0040	118,-
50.0	36	22	6	210525 0050	164,-
63.0	40	27	8	210525 0063	229,-
80.0	45	27	8	210525 0080	380,-
100.0	50	32	10	210525 0100	589,-
125.0	56	40	12	210525 0125	899,-
				2104	



## End milling cutters HSS and solid carbide

INFO

## HSS

**High-speed steel** is a high-alloy tool steel that is largely used as a cutting material i.e. for milling tools, drills, turning tools and broaching tools. The name refers to three to four-times higher cutting speeds compared with conventional tool steel. While conventional tool steel loses its hardness from approx. 200°C, high-speed steel retains its hardness up to approx 600°C.

**Universal**  
primarily for ISO P

Page 442

## Solid carbide

Cutting tools that are made entirely of carbide, compared with coated tools or tools composed of various materials, are classified as **solid carbide** or SC.

**Universal**  
primarily for ISO P

Page 466

**Stainless steel / superalloys**  
primarily for ISO M

Page 525

**Aluminium**  
primarily for ISO N

Page 499

**Graphite**  
primarily for ISO N

Page 534

**Composites**  
primarily for ISO N

Page 541

**Hard materials**  
primarily for ISO H

Page 553

## Solid carbide milling cutter range

for modern **milling strategies**.

HPC

Page 484

HPC Power

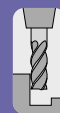
Page 492

Trochoidal

Page 495








**Form milling cutters and  
deburring tools**

from Page 601





## Overview of HSS / HSS-E / HSS-E-PM end milling cutters

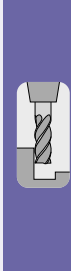
	End milling cutters							
Sorting by type and number of cutting edges								
Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	SARA®	SARA®
ISO	N	N	P M K N	P M K N	P M K N	P M K N	N	N
Number of cutting edges	1	1	2	2	2	2	2	2
Diameter range / mm	3 - 8	3 - 8	1 - 40	2 - 25	2 - 22	2 - 20	6 - 25	6 - 20
Standard	Factory standard	Factory standard	327D	327D	327D	327D	DIN844	DIN844
Version	Short	Long	Short	Short	Long	Long	Short	Long
Type/profile	W	W	N	N	N	N	W	W
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating				AlCrN		AlCrN		
Order No.	290534....	290535....	220101....	220110....	220115....	220125....	290533....	290539....
Catalogue page	446	446	447	447	447	447	448	448

	End milling cutters					
Sorting by type and number of cutting edges						
Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
ISO	P M K S N H	P M K N	P M K N	P M K N	P M K N	P M K N
Number of cutting edges	2	3	3	3	3	3
Diameter range / mm	4 - 28	1 - 10	2 - 10	1.5 - 30.0	2 - 20	3 - 30
Standard	DIN327N	Factory standard	Factory standard	DIN844B	DIN844B	DIN844B
Version	Short	Short	Long	Short	Short	Long
Type/profile	N	N	N	N	N	N
Cutting material	HSS-E-PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating	TiAlN				AlCrN	
Order No.	226205....	222001....	222010....	220501....	220510....	220515....
Catalogue page	448	449	449	450	450	450






	End milling cutters							
Sorting by type and number of cutting edges								
Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
ISO	P M K N	P M K N	P M K S N H	P M K S N H	P M K S N H	P M K N H S	P M K N H S	P M K N H S
Number of cutting edges	3	4 - 6	4	4 - 6	4	4 - 6	3	4 - 6
Diameter range / mm	3 - 20	2 - 30	3 - 20	3 - 32	6 - 20	2 - 32	4 - 28	6 - 32
Standard	DIN844B	DIN844B	DIN844	DIN844	DIN844	DIN844N	DIN844W	DIN844N
Version	Long	Short	Short	Long	Long	Short	Short	Long
Type/profile	N	N	N	N	N	N	N	N
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM
Coating	AlCrN		AlCrN		AlCrN	TiAlN	TiAlN	TiAlN
Order No.	220525....	224001....	224010....	224015....	224055....	226225....	226215....	226235....
Catalogue page	450	451	451	451	451	452	452	453






Overview of HSS / HSS-E / HSS-E-PM end milling cutters (cont'd)

Sorting by type and number of cutting edges	Roughing cutter							
								
Brand	<b>SARA</b>	<b>SARA</b>	<b>ATORN</b>	<b>ATORN</b>	<b>ATORN</b>	<b>ATORN</b>	<b>SARA</b>	<b>SARA</b>
ISO	<b>P M K N</b>	<b>P M K N</b>	<b>P M K S N H</b>	<b>P M K S N H</b>	<b>P M K S N H</b>	<b>P M K S N H</b>	<b>P M K N</b>	<b>P M K N</b>
Number of cutting edges	4 - 6	4	4 - 5	4	4 - 6	4 - 6	4 - 5	4 - 5
Diameter range / mm	6 - 40	6 - 20	6 - 20	6 - 20	6 - 32	6 - 32	6 - 25	6 - 25
Standard	DIN844B	DIN844B	DIN844	DIN844	DIN844	DIN844	DIN844B	DIN844B
Version	Short	Short	Short	Long	Short	Long	Short	Short
Type/profile	NF	NF	NF	NF	NR-F	NR-F	HR	HR
Cutting material	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E	HSS-E
Coating		AlCrN	TiAlN	TiAlN	TiAlN	TiAlN		AlCrN
Order No.	226001....	226010....	226255....	226275....	226245....	226265....	225030....	225040....
Catalogue page	<b>453</b>	<b>453</b>	<b>454</b>	<b>454</b>	<b>454</b>	<b>455</b>	<b>455</b>	<b>455</b>



Sorting by type and number of cutting edges	Roughing cutter							
								
Brand	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>
ISO	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K S N H</b>	<b>N</b>
Number of cutting edges	4 - 6	4 - 6	3 - 6	3 - 6	4 - 6	4 - 5	3 - 6	3
Diameter range / mm	8 - 30	8 - 30	6 - 40	6 - 32	6 - 40	6 - 32	4 - 25	6 - 30
Standard	DIN844B	DIN844B	DIN844B	DIN844B	DIN844HR	DIN844B	DIN844HR	DIN844
Version	Long	Long	Short	Short	Long	Long	Short	Short
Type/profile	HR	HR	NR	NR	NR		HR	WR
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E
Coating		AlCrN		AlCrN		AlCrN	TiAlN	
Order No.	290929....	290931....	225001....	225010....	225015....	225025....	226247....	290963....
Catalogue page	<b>455</b>	<b>455</b>	<b>456</b>	<b>456</b>	<b>456</b>	<b>456</b>	<b>457</b>	<b>457</b>

Sorting by type and number of cutting edges	Radius milling cutters		Form milling cutters		
					
Brand	<b>ATORN</b>	<b>ATORN</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>
ISO	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>
Number of cutting edges	2	2	6 - 10	6 - 10	4 - 8
Diameter range / mm	3 - 20	3 - 20	4.5 - 45.5	11 - 60	12.5 - 40.0
Standard	327	327	DIN850	DIN851	DIN851
Version	Short	Long	Short	Short	Short
Type/profile	N	N	N	N	NR
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating					
Order No.	221001....	221005....	291360....	291365....	291367....
Catalogue page	<b>458</b>	<b>458</b>	<b>459</b>	<b>459</b>	<b>460</b>

	Form milling cutters				
Sorting by type and number of cutting edges					
Brand	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>
ISO	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>
Number of cutting edges	6 - 10	6 - 10	10 - 12	10 - 12	4 - 6
Diameter range / mm	16 - 32	16 - 32	16 - 32	16 - 32	8 - 56
Standard	DIN1833	DIN1833	DIN1833	DIN1833	DIN6518
Version	Short 45°	Short 60°	Short 45°	Short 60°	Short
Type/profile	N	N	N	N	N
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating					
Order No.	291392...	291393...	291394...	291395...	291304...
Catalogue page	<b>460</b>	<b>460</b>	<b>461</b>	<b>461</b>	<b>461</b>

WHEN  
**ADDITIVE**  
 IS A FAMILIAR WORD IN  
**MANUFACTURING.**



THAT'S POWER TO PRODUCE

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE



**YOUR DRILL  
GIVES UP.  
WHAT DO YOU DO? YOU REACH  
FOR A NEW ONE**

**AND SIMPLY CARRY ON:**

**SARA® GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

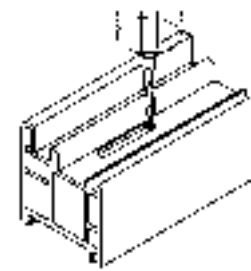
**SARATOOLS.com**  
**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

## SARA® Single-blade end milling cutters

HSS-E
Werknorm
Typ W
30°
DIN 6535 HA
Z 1
Vc/fz 749

- Special geometry for aluminium and plastics
- Centre cutting



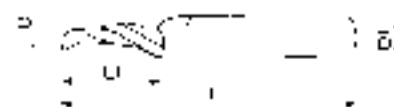
material	● very well suited	steel			stainless steel			cast iron	titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
												●	●	●					
												100	120	90					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Short

D mm	L1 mm	L mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	10	60	8	0.005	0.007	290534 0030	14,85
4.0	12	60	8	0.006	0.008	290534 0040	14,85
5.0	14	60	8	0.009	0.013	290534 0050	14,85
6.0	14	60	8	0.012	0.017	290534 0060	14,85
8.0	14	80	8	0.018	0.025	290534 0080	16,60

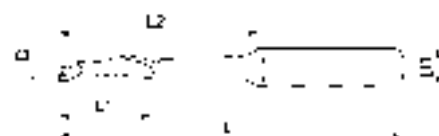
2105



### Long

D mm	L1 mm	L mm	L2 mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4.0	16	80	45	8	0.006	0.008	290535 0040	23,70
5.0	16	80	45	8	0.009	0.013	290535 0050	23,70
6.0	14	80	37	8	0.012	0.017	290535 0060	23,70
8.0	14	80	55	8	0.018	0.025	290535 0080	36,30

2105



# Metal saw blades

Page 425

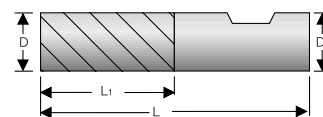




# ATORN® Slot drill

HSS-E
DIN 327
Typ N
30°
DIN 1835 B
Z 2
AlCrN
Vc/fz
749

• For P9 keyways



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
220101....	●	24	24		13	17		27	27			180	55	45					
220110....	●	41	41		19	24		38	38			260	80	55					
220115....	●	24	24		13	17		27	27			180	55	45					
220125....	●	41	41		19	24		38	38			260	80	55					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D	L1	L	D1	Feed fz	art.no.	€	AlCrN	€
mm	mm	mm	mm	steel < 1000 N/mm²			art.no.	
1.0	3	48	6	0.002	220101 0010	14,15		
1.5	3	48	6	0.002	220101 0015	13,75		
2.0	4	48	6	0.003	220101 0020	10,30	220110 0020	14,75
2.5	5	49	6	0.003	220101 0025	10,30	220110 0025	14,75
3.0	5	49	6	0.003	220101 0030	8,10	220110 0030	14,75
3.5	6	50	6	0.003	220101 0035	10,30	220110 0035	14,75
3.8	7	51	6	0.003	220101 0038	10,30	220110 0038	14,75
4.0	7	51	6	0.005	220101 0040	8,10	220110 0040	14,75
4.5	8	52	6	0.005	220101 0045	10,30	220110 0045	14,75
4.8	8	52	6	0.005	220101 0048	10,30	220110 0048	14,75
5.0	8	52	6	0.005	220101 0050	8,35	220110 0050	14,75
5.5	8	52	6	0.005	220101 0055	10,30	220110 0055	14,75
6.0	8	52	6	0.007	220101 0060	8,35	220110 0060	15,80
6.5	10	60	10	0.007	220101 0065	12,25		
7.0	10	60	10	0.007	220101 0070	12,25	220110 0070	18,05
7.5	10	60	10	0.007	220101 0075	12,25		
7.75	11	61	10	0.007	220101 0077	12,25		
8.0	11	61	10	0.01	220101 0080	11,-	220110 0080	18,05
8.5	11	61	10	0.01	220101 0085	14,80		

2106 2106

D	L1	L	D1	Feed fz	art.no.	€	AlCrN	€
mm	mm	mm	mm	steel < 1000 N/mm²			art.no.	
9.0	11	61	10	0.01	220101 0090	14,80		
9.5	13	63	10	0.01	220101 0095	14,80		
10.0	13	63	10	0.016	220101 0100	12,25	220110 0100	18,05
11.0	13	70	12	0.016	220101 0110	19,75	220110 0110	25,60
12.0	16	73	12	0.025	220101 0120	17,50	220110 0120	25,60
13.0	16	73	12	0.025	220101 0130	23,20		
14.0	16	73	12	0.025	220101 0140	23,40	220110 0140	30,90
15.0	19	79	16	0.025	220101 0150	28,-	220110 0150	37,60
16.0	19	79	16	0.03	220101 0160	28,30	220110 0160	37,60
18.0	19	79	16	0.03	220101 0180	33,80	220110 0180	45,70
20.0	22	88	20	0.035	220101 0200	39,10	220110 0200	57,60
22.0	22	88	20	0.035	220101 0220	57,-	220110 0220	88,40
25.0	26	102	25	0.035	220101 0250	62,90	220110 0250	108,-
26.0	26	102	25	0.035	220101 0260	72,60		
28.0	26	102	25	0.035	220101 0280	72,80		
30.0	26	102	25	0.035	220101 0300	92,30		
32.0	32	112	32	0.035	220101 0320	99,70		
36.0	32	112	32	0.035	220101 0360	134,50		
40.0	38	130	40	0.035	220101 0400	168,50		

2106 2106

## Long

D	L1	L	D1	Feed fz	art.no.	€	AlCrN	€
mm	mm	mm	mm	steel < 1000 N/mm²			art.no.	
2.0	7	51	6	0.003	220115 0020	16,-	220125 0020	22,-
2.5	8	52	6	0.003	220115 0025	16,-	220125 0025	22,90
3.0	8	52	6	0.003	220115 0030	14,85	220125 0030	21,60
3.5	10	54	6	0.003	220115 0035	16,-	220125 0035	22,90
4.0	11	55	6	0.004	220115 0040	14,85	220125 0040	21,60
4.5	13	57	6	0.004	220115 0045	16,-	220125 0045	22,90
5.0	13	57	6	0.004	220115 0050	14,85	220125 0050	21,60
5.5	13	57	6	0.004	220115 0055	16,-	220125 0055	23,10
6.0	13	57	6	0.006	220115 0060	14,85	220125 0060	21,70
6.5	16	60	10	0.006	220115 0065	22,80	220125 0065	28,10
7.0	16	60	10	0.006	220115 0070	22,80		

2106 2106

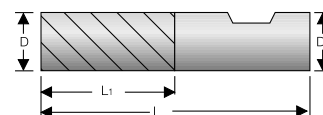
D	L1	L	D1	Feed fz	art.no.	€	AlCrN	€
mm	mm	mm	mm	steel < 1000 N/mm²			art.no.	
8.0	19	69	10	0.009	220115 0080	21,-	220125 0080	24,50
8.5	19	69	10	0.009	220115 0085	22,80		
9.0	19	69	10	0.009	220115 0090	22,80		
10.0	22	72	10	0.014	220115 0100	21,-	220125 0100	26,50
11.0	22	79	12	0.014	220115 0110	31,60		
12.0	26	83	12	0.021	220115 0120	24,60	220125 0120	29,30
14.0	26	83	12	0.021	220115 0140	41,80	220125 0140	52,40
16.0	32	92	16	0.025	220115 0160	49,90	220125 0160	62,10
18.0	32	92	16	0.025	220115 0180	64,10	220125 0180	80,40
20.0	38	104	20	0.031	220115 0200	65,50	220125 0200	80,40
22.0	38	104	20	0.031	220115 0220	91,70		

2106 2106



## SARA Aluminium slot drill

HSS-E
DIN 844
Typ W
40°
DIN 1835 B
Z 2
Vc/fz 749



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	30-35	< 55 HRc	< 60 HRc	≥ 60 HRc		
												●	●	○					

70-85    35-45

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Short

D mm	L1 mm	L mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	13	57	6	0.013	290533 0060	16,60
8.0	19	69	10	0.019	290533 0080	19,75
10.0	22	72	10	0.025	290533 0100	22,-
12.0	26	83	12	0.03	290533 0120	25,40
16.0	32	92	16	0.038	290533 0160	37,50
20.0	38	104	20	0.045	290533 0201	52,40
25.0	45	121	25	0.055	290533 0250	76,80

2105



### Long

D mm	L1 mm	L mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	24	68	6	0.013	290539 0060	21,10
8.0	38	82	10	0.019	290539 0080	25,60
10.0	45	95	10	0.025	290539 0100	26,20
12.0	53	110	12	0.03	290539 0120	30,70
16.0	63	123	16	0.038	290539 0160	44,70
20.0	75	141	20	0.045	290539 0201	76,80

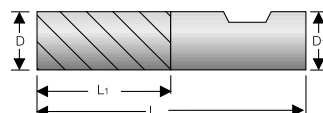
2105



## ATORN Slot drill

HSS-E PM
DIN 327N
30°
DIN 1835 B
Z 2
TiAlN
Vc/fz 751

- Eccentric relief grinding
- For P9 keyways



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	110-210	< 55 HRc	< 60 HRc	≥ 60 HRc		
		●	●	○	●	○		●	●	○			○	○	●	○			

55-80    55-80    45-75    30-45    30-45    35-65    35-65    30-45    290-420    90-170

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

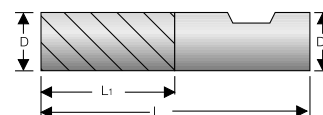
D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4.0	7	51	6	0.012	226205 0040	19,25
5.0	8	52	6	0.012	226205 0050	19,25
6.0	8	52	6	0.018	226205 0060	19,25
7.0	10	60	10	0.018	226205 0070	25,30
8.0	11	61	10	0.021	226205 0080	25,30
9.0	11	61	10	0.021	226205 0090	26,30
10.0	13	63	10	0.035	226205 0100	30,30
12.0	16	73	12	0.041	226205 0120	40,50
14.0	16	73	12	0.041	226205 0140	49,-
16.0	19	79	16	0.069	226205 0160	54,90
18.0	19	79	16	0.069	226205 0180	67,40
20.0	22	88	20	0.069	226205 0200	86,50
25.0	26	102	25	0.069	226205 0250	135,50
28.0	26	102	25	0.069	226205 0280	175,-

2106



**ATORN® End milling cutters**

HSS-E
Werks-norm
Typ N
30°
DIN 1835 B
Z 3
Vc/fz
749



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
222001....	●	●	●		○	○		○	○				○	○	○				
222010....	○	●	●		○	○		○	○				○	○	○				
		40	30		15	20		30	30				70	60	50				
		24	24		13	17		27	27				180	55	45				

Cutting speed Vc m./min. Please adjust these guidelines according to clamping operation and machine set-up.

**Short**

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
1.0	2	34	6	0.002	<b>222001</b> 0010	7,75
1.5	3	34	6	0.002	222001 0015	7,75
1.8	3	34	6	0.002	222001 0018	7,75
2.0	4.5	35	6	0.002	222001 0020	7,75
2.3	4	35	6	0.004	222001 0023	7,75
2.5	5.5	36	6	0.004	222001 0025	7,75
2.8	5.5	36	6	0.004	222001 0028	7,75
3.0	5.5	37	6	0.007	222001 0030	7,75
3.3	6	37	6	0.007	222001 0033	7,75
3.5	6	38	6	0.007	222001 0035	7,75
3.8	7.5	38	6	0.007	222001 0038	7,75
4.0	7.5	38	6	0.007	222001 0040	7,75
4.3	7.5	38	6	0.01	222001 0043	7,75
4.5	7.5	38	6	0.01	222001 0045	7,75
4.8	8.5	39	6	0.01	222001 0048	7,75
5.0	8.5	39	6	0.01	222001 0050	7,75
5.3	8	39	6	0.013	222001 0053	7,75
5.5	8.5	39	6	0.013	222001 0055	7,75
6.0	8.5	39	6	0.013	222001 0060	7,75
6.5	10	42	8	0.013	222001 0065	7,75
7.0	10	42	8	0.016	222001 0070	9,40
8.0	11	42	8	0.016	222001 0080	9,40
8.5	11	48	10	0.02	222001 0085	10,60
9.0	11	48	10	0.02	222001 0090	12,50
10.0	13	50	10	0.02	222001 0100	11,90

2106



**Long**

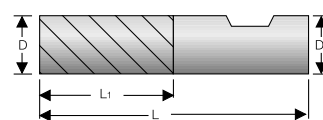
D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
2.0	7.5	38	6	0.002	<b>222010</b> 0020	8,75
2.5	8.5	39	6	0.002	222010 0025	8,75
3.0	8.5	39	6	0.007	222010 0030	8,75
3.5	10.5	41	6	0.007	222010 0035	8,75
4.0	11.5	42	6	0.007	222010 0040	8,75
4.5	11.5	42	6	0.01	222010 0045	8,75
5.0	13.5	44	6	0.01	222010 0050	8,75
5.5	13.5	44	6	0.013	222010 0055	8,75
6.0	13.5	44	6	0.013	222010 0060	8,75
6.5	16	48	8	0.015	222010 0065	10,-
7.0	16	48	8	0.016	222010 0070	10,40
8.0	19	51	8	0.016	222010 0080	10,40
9.0	19	56	10	0.02	222010 0090	13,35
10.0	22	59	10	0.02	222010 0100	13,35

2106



# ATORN® End milling cutters

HSS-E
DIN 844
Typ N
30°
DIN 1835 B
Z 3
AlCrN
Vc/fz
749



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
220501....	●	24	24		13	17		27	27			180	55	45					
220510....	●	41	41		19	24		38	38			260	80	55					
220515....	●	23	23		12	16		25	25			162	50	40					
220525....	●	37	37		17	22		28	28			234	72	50					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
1.5	7	51	6	0.002	220501 0015	12,05		
2.0	7	51	6	0.003	220501 0020	12,05	220510 0020	15,70
3.0	8	52	6	0.003	220501 0030	12,05	220510 0030	15,90
4.0	11	55	6	0.005	220501 0040	12,05	220510 0040	15,90
4.5	13	57	6	0.005	220501 0045	12,05	220510 0045	15,90
5.0	13	57	6	0.005	220501 0050	12,05	220510 0050	15,90
5.5	13	57	6	0.005	220501 0055	12,05	220510 0055	15,90
6.0	13	57	6	0.007	220501 0060	12,05	220510 0060	15,90
6.5	16	60	10	0.007	220501 0065	16,-		
7.0	16	60	10	0.007	220501 0070	15,70	220510 0070	20,60
7.5	19	63	10	0.007	220501 0075	15,70		
8.0	19	69	10	0.01	220501 0080	15,70	220510 0080	20,60
8.5	19	69	10	0.01	220501 0085	15,70		
9.0	19	69	10	0.01	220501 0090	15,70	220510 0090	21,20
9.5	22	72	10	0.01	220501 0095	15,70		
10.0	22	72	10	0.016	220501 0100	15,70	220510 0100	21,40
11.0	22	79	12	0.016	220501 0110	23,30	220510 0110	29,70
12.0	26	83	12	0.025	220501 0120	20,20	220510 0120	29,70
13.0	26	83	12	0.025	220501 0130	31,50	220510 0130	39,90
14.0	26	83	12	0.025	220501 0140	31,50	220510 0140	39,90
15.0	32	92	16	0.025	220501 0150	32,70	220510 0150	41,20
16.0	32	92	16	0.03	220501 0160	31,10	220510 0160	39,-
17.0	32	92	16	0.03	220501 0170	43,70		
18.0	32	92	16	0.03	220501 0180	42,30	220510 0180	53,40
20.0	38	104	20	0.035	220501 0200	47,30	220510 0200	59,60
22.0	38	104	20	0.035	220501 0220	73,40	220510 0220	92,-
24.0	45	121	25	0.035	220501 0240	69,10		
25.0	45	121	25	0.035	220501 0250	72,-		
28.0	45	121	25	0.035	220501 0280	120,50		
30.0	45	121	25	0.035	220501 0300	136,50		

2106

2106



## Long

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
3.0	12	56	6	0.003	220515 0030	17,30	220525 0030	23,90
4.0	19	63	6	0.004	220515 0040	17,30	220525 0040	23,90
5.0	24	68	6	0.004	220515 0050	16,60	220525 0050	24,20
6.0	24	68	6	0.006	220515 0060	16,-	220525 0060	24,20
8.0	38	82	10	0.009	220515 0080	21,80	220525 0080	28,30
10.0	45	95	10	0.014	220515 0100	22,80	220525 0100	29,50
12.0	53	110	12	0.021	220515 0120	28,10	220525 0120	34,-
14.0	53	110	12	0.021	220515 0140	42,80	220525 0140	53,40
16.0	63	123	16	0.025	220515 0160	45,80	220525 0160	56,50
18.0	63	123	16	0.025	220515 0180	58,60	220525 0180	64,60
20.0	75	141	20	0.031	220515 0200	64,50	220525 0200	75,30

2106

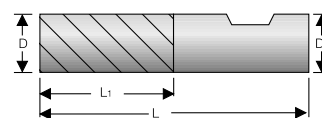
2106



# ATORN® End milling cutters

HSS-E
DIN 844
Typ N
30°
DIN 1835 B
Z 4
Z 5
Z 6
AlCrN
Vc/fz
749

• Face cutter geometry for plunge milling (not extra-long version)



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
224001....	●	20-25	20-25		10-15	10-15		18-20	18-20				80-100	40-50	35-45				
224010....	●	50-60	50-60		25-30	25-30		45-55	45-55				120-14	100-130	85-105				
224015....	●	20-25	18-22		10-15	10-15		10-15	15-20				70-90	35-45	50-60				
224055....	●	45-55	40-50		30-40	30-40		35-45	35-45				100-130	100-120	80-100				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
2.0	7	51	6	4	0.002	224001 0020	10,65		
2.5	8	52	6	4	0.002	224001 0025	10,65		
3.0	8	52	6	4	0.003	224001 0030	10,65	224010 0030	15,60
3.5	10	54	6	4	0.003	224001 0035	10,65		
4.0	11	55	6	4	0.007	224001 0040	10,65	224010 0040	15,60
5.0	13	57	6	4	0.009	224001 0050	10,65	224010 0050	15,60
6.0	13	57	6	4	0.011	224001 0060	10,65	224010 0060	15,90
7.0	16	60	10	4	0.011	224001 0070	14,60	224010 0070	19,55
8.0	19	69	10	4	0.016	224001 0080	14,60	224010 0080	19,55
8.5	19	69	10	4	0.016	224001 0085	14,60		
9.0	19	69	10	4	0.016	224001 0090	14,60		
10.0	22	72	10	4	0.021	224001 0100	13,70	224010 0100	20,20
11.0	22	79	12	4	0.021	224001 0110	20,90		
12.0	26	83	12	4	0.026	224001 0120	18,25	224010 0120	24,50
13.0	26	83	12	4	0.026	224001 0130	32,70		
14.0	26	83	12	4	0.026	224001 0140	32,70	224010 0140	34,10
15.0	32	92	16	4	0.026	224001 0150	32,80		
16.0	32	92	16	4	0.032	224001 0160	28,60	224010 0160	39,20
18.0	32	92	16	4	0.032	224001 0180	47,30	224010 0180	45,40
20.0	38	104	20	4	0.038	224001 0200	41,50	224010 0200	56,-
22.0	38	104	20	5	0.038	224001 0220	49,80		
24.0	45	121	25	5	0.04	224001 0240	68,90		
28.0	45	121	25	6	0.045	224001 0280	75,40		
30.0	45	121	25	6	0.05	224001 0300	113,-		



## Long

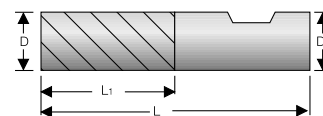
D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
3.0	12	56	6	4	0.002	224015 0030	16,90		
4.0	19	63	6	4	0.004	224015 0040	16,90		
5.0	24	68	6	4	0.006	224015 0050	16,90		
6.0	24	68	6	4	0.008	224015 0060	16,90	224055 0060	22,10
7.0	30	74	10	4	0.008	224015 0070	24,40		
8.0	38	82	10	4	0.012	224015 0080	24,40	224055 0080	32,40
9.0	38	88	10	4	0.012	224015 0090	24,40		
10.0	45	95	10	4	0.015	224015 0100	24,40	224055 0100	34,40
11.0	45	102	12	4	0.015	224015 0110	33,20		
12.0	53	110	12	4	0.018	224015 0120	33,20	224055 0120	43,30
14.0	53	110	12	4	0.018	224015 0140	48,10	224055 0140	59,50
16.0	63	123	16	4	0.023	224015 0160	58,80	224055 0160	72,80
18.0	63	123	16	4	0.023	224015 0180	72,20	224055 0180	88,50
20.0	75	141	20	4	0.028	224015 0200	67,90	224055 0200	96,20
22.0	75	141	20	5	0.03	224015 0220	78,60		
25.0	90	166	25	5	0.038	224015 0250	97,70		
28.0	90	166	25	6	0.04	224015 0280	123,50		
30.0	90	166	25	6	0.045	224015 0300	137,-		
32.0	106	186	32	6	0.05	224015 0320	152,-		



### ATORN® End milling cutters

HSS-E PM
DIN 844N
45°
DIN 1835 B
Z 3
TiAlN
Vc/fz
751

• Eccentric relief grinding



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si			<55 HRc	<60 HRc	≥60 HRc	
		45-75	45-65	30-45		20-35		25-45	25-45	30-45										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 h6 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4.0	11	55	6	0.008	226215 0040	23,80
5.0	13	57	6	0.008	226215 0050	23,80
6.0	13	57	6	0.018	226215 0060	23,80
7.0	16	66	10	0.018	226215 0070	34,10
8.0	19	69	10	0.021	226215 0080	34,10
9.0	19	69	10	0.021	226215 0090	34,10
10.0	22	72	10	0.036	226215 0100	36,90
12.0	26	83	12	0.036	226215 0120	48,50
14.0	26	83	12	0.036	226215 0140	60,30
16.0	32	92	16	0.053	226215 0160	69,50
18.0	32	92	16	0.053	226215 0180	78,60
20.0	38	104	20	0.053	226215 0200	101,50
25.0	45	121	25	0.053	226215 0250	166,-
28.0	45	121	25	0.053	226215 0280	203,-

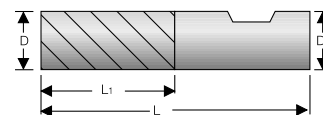
2106



### ATORN® End milling cutters

HSS-E PM
DIN 844N
30°
DIN 1835 B
Z 4
Z 6
TiAlN
Vc/fz
751

• Eccentric relief grinding



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si			<55 HRc	<60 HRc	≥60 HRc
		45-75	30-45		20-35	30-45		35-65	35-65	30-45			290-420	90-170	110-210		20-35		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

#### Short

D mm	L1 mm	L mm	D1 h6 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
2.0	7	51	6	4	0.008	226225 0020	19,75
3.0	8	52	6	4	0.008	226225 0030	19,75
4.0	11	55	6	4	0.009	226225 0040	19,75
5.0	13	57	6	4	0.01	226225 0050	19,75
6.0	13	57	6	4	0.018	226225 0060	19,75
7.0	16	66	10	4	0.018	226225 0070	28,10
8.0	19	69	10	4	0.021	226225 0080	28,10
9.0	19	69	10	4	0.021	226225 0090	28,10
10.0	22	72	10	4	0.035	226225 0100	28,10
12.0	26	83	12	4	0.041	226225 0120	36,10
14.0	26	83	12	4	0.041	226225 0140	54,10
16.0	32	92	16	4	0.069	226225 0160	58,80
18.0	32	92	16	4	0.069	226225 0180	76,60
20.0	38	104	20	4	0.069	226225 0200	75,40
25.0	45	121	25	6	0.069	226225 0250	129,-
28.0	45	121	25	6	0.069	226225 0280	166,-
30.0	45	121	25	6	0.069	226225 0300	173,-
32.0	53	133	32	6	0.069	226225 0320	172,-

2106

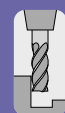




Long

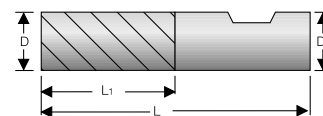
D mm	L1 mm	L mm	D1 h6 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
6.0	24	68	6	4	0.018	<b>226235 0060</b>	<b>30,70</b>
8.0	38	88	10	4	0.021	226235 0080	<b>38,90</b>
10.0	45	95	10	4	0.035	226235 0100	<b>42,40</b>
12.0	53	110	12	4	0.011	226235 0120	<b>55,-</b>
14.0	53	110	12	4	0.011	226235 0140	<b>63,10</b>
16.0	63	123	16	4	0.069	226235 0160	<b>78,90</b>
18.0	63	123	16	4	0.069	226235 0180	<b>96,70</b>
20.0	75	141	20	4	0.069	226235 0200	<b>112,-</b>
25.0	90	166	25	6	0.069	226235 0250	<b>185,50</b>
32.0	106	186	32	6	0.069	226235 0320	<b>255,-</b>

2106



**SARA** Roughing / finishing cutter

HSS-E
DIN 844B
NF
30°
DIN 1835 B
Z 4
Z 5
Z 6
AlCrN
Vc/fz 749



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
226001....	● 25-30	● 25-30		○ 18-25	○ 18-25		○ 25-30	○ 25-30											
226010....	● 50-60	● 45-55		○ 35-45	○ 35-45		○ 45-55	○ 45-55											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€	AlCrN art.no.	€
6.0	13	57	6	4	0.009	<b>226001 0060</b>	<b>25,50</b>	<b>226010 0060</b>	<b>39,90</b>
7.0	16	60	8	4	0.009	226001 0070	<b>29,40</b>		
8.0	19	69	10	4	0.014	226001 0080	<b>30,10</b>	226010 0080	<b>45,-</b>
10.0	22	72	10	4	0.018	226001 0100	<b>33,20</b>	226010 0100	<b>50,60</b>
11.0	22	79	12	4	0.018	226001 0110	<b>37,80</b>		
12.0	26	83	12	4	0.022	226001 0120	<b>35,60</b>	226010 0120	<b>56,-</b>
14.0	26	83	12	4	0.022	226001 0140	<b>40,-</b>	226010 0140	<b>67,20</b>
16.0	32	92	16	4	0.027	226001 0160	<b>46,70</b>	226010 0160	<b>81,90</b>
18.0	32	92	16	4	0.027	226001 0180	<b>49,60</b>	226010 0180	<b>98,20</b>
20.0	38	104	20	4	0.033	226001 0200	<b>61,10</b>	226010 0200	<b>109,-</b>
22.0	38	104	20	4	0.035	226001 0220	<b>70,90</b>		
28.0	45	121	25	5	0.045	226001 0280	<b>107,-</b>		
32.0	53	133	32	6	0.055	226001 0320	<b>142,-</b>		

2105

2105

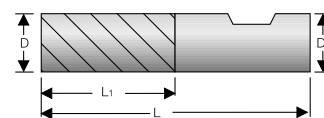




## ATORN® Roughing / finishing cutter

HSS-E PM
DIN 844 NF
30°
DIN 1835 B
Z 4
Z 5
TiAlN
Vc/fz 752

• Eccentric relief grinding



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		55-80	45-65	30-45	30-45	30-45		25-45	25-45	30-45					90-190		20-35		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Short

D	L1	L	D1 h6	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	13	57	6	4	0.009	0.018	226255 0060	31,80
8.0	19	69	10	4	0.011	0.021	226255 0080	39,40
10.0	22	72	10	5	0.017	0.035	226255 0100	33,20
12.0	26	83	12	5	0.021	0.042	226255 0120	42,90
14.0	26	83	12	5	0.021	0.042	226255 0140	48,80
16.0	32	92	16	5	0.035	0.069	226255 0160	57,50
20.0	38	104	20	5	0.035	0.069	226255 0200	81,90



2106

### Long

D	L1	L	D1 h6	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	24	68	6	4	0.009	0.018	226275 0060	50,60
8.0	38	88	10	4	0.011	0.021	226275 0080	58,-
10.0	45	95	10	4	0.017	0.035	226275 0100	56,50
12.0	53	110	12	4	0.021	0.042	226275 0120	75,80
16.0	63	123	16	4	0.035	0.069	226275 0160	106,-
20.0	75	141	20	4	0.035	0.069	226275 0200	143,50



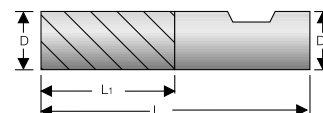
2106

## ATORN® Roughing cutter

HSS-E PM
DIN 844 NR-F
30°
DIN 1835 B
Z 4
Z 5
Z 6
TiAlN
Vc/fz 752

• With fine knuckle-type tooth profile

• Eccentric relief grinding



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		45-75	45-75	20-35	30-45			25-45	25-45	30-45							20-35		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Short

D	L1	L	D1	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	13	57	6	4	0.012	0.021	226245 0060	33,60
7.0	16	66	10	4	0.012	0.021	226245 0070	45,60
8.0	19	69	10	4	0.014	0.0245	226245 0080	39,-
9.0	19	69	10	4	0.014	0.0245	226245 0090	46,80
10.0	22	72	10	5	0.0232	0.0406	226245 0100	38,90
12.0	26	83	12	5	0.0276	0.041	226245 0120	48,-
14.0	26	83	12	5	0.0276	0.041	226245 0140	61,-
16.0	32	92	16	5	0.046	0.0805	226245 0160	74,30
18.0	32	92	16	5	0.046	0.0805	226245 0180	84,-
20.0	38	104	20	5	0.046	0.0805	226245 0200	96,20
22.0	38	104	20	5	0.046	0.0805	226245 0220	128,-
25.0	45	121	25	5	0.046	0.0805	226245 0250	147,-
28.0	45	121	25	5	0.046	0.0805	226245 0280	165,-
30.0	45	121	25	5	0.046	0.0805	226245 0300	206,-
32.0	53	133	32	6	0.046	0.0805	226245 0320	212,-



2106



Long

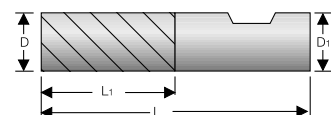
D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
6.0	24	68	6	4	0.012	0.021	226265 0060	60,10
8.0	38	88	10	4	0.014	0.0245	226265 0080	61,10
10.0	45	95	10	4	0.0232	0.0406	226265 0100	59,-
12.0	53	110	12	4	0.0276	0.0421	226265 0120	72,80
14.0	53	110	12	4	0.0276	0.0421	226265 0140	85,50
16.0	63	123	16	4	0.046	0.0805	226265 0160	105,-
18.0	63	123	16	4	0.046	0.0805	226265 0180	121,50
20.0	75	141	20	4	0.046	0.0805	226265 0200	142,50
25.0	90	166	25	5	0.046	0.0805	226265 0250	219,-
32.0	106	186	32	6	0.046	0.0805	226265 0320	306,-

2106

SARA® Roughing cutter

HSS-E
DIN 844
HR
30°
DIN 1835 B
Z 4
Z 5
AlCrN
Vc/fz 749

• Relief-ground knuckle profile



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
225030....	●	●	●		○	○		○	○										
225040....	○	●	●		○	○		○	○										
290929....	○	●	○	○	○	○		○	○										
290931....	○	●	○	○	○	○		○	○			○	○	○					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Short

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€	AlCrN art.no.	€
6.0	13	57	6	4	0.009	225030 0060	21,90	225040 0060	27,40
8.0	19	69	10	4	0.014	225030 0080	24,90	225040 0080	30,40
10.0	22	72	10	4	0.018	225030 0100	25,70	225040 0100	31,20
12.0	26	83	12	4	0.022	225030 0120	29,-	225040 0120	34,40
14.0	26	83	12	4	0.022	225030 0140	34,30	225040 0140	48,10
16.0	32	92	16	4	0.027	225030 0160	37,40	225040 0160	51,-
18.0	32	92	16	4	0.027	225030 0180	45,-	225040 0180	58,60
20.0	38	104	20	4	0.033	225030 0200	55,-	225040 0200	68,90
25.0	45	121	25	5	0.04	225030 0250	87,50	225040 0250	106,-

2105

2105



Long

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€	AlCrN art.no.	€
8.0	38	88	10	4	0.012	290929 0080	33,30	290931 0080	41,-
10.0	45	95	10	4	0.015	290929 0100	39,50	290931 0100	45,50
12.0	53	110	12	4	0.018	290929 0120	45,80	290931 0120	51,90
16.0	63	123	16	4	0.023	290929 0160	59,50	290931 0160	74,30
18.0	63	123	16	4	0.023	290929 0180	72,80	290931 0180	87,50
20.0	75	141	20	4	0.028	290929 0201	79,40	290931 0201	94,10
25.0	90	166	25	4	0.035	290929 0250	105,-	290931 0250	123,50

2105

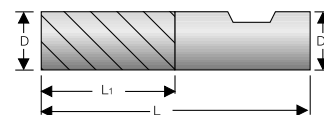
2105



**SARA® Roughing cutter**



• Multi-blade milling cutter, relief-ground knurled profile



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
225001....	●	25-30	25-30		18-25	18-25		25-30	25-30											
225010....	●	50-60	45-55		35-45	35-45		45-55	45-55											
225015....	●	25-30	25-30		18-25	18-25		25-30	25-30											
225025....	●	50-60	45-55		35-45	35-45		45-55	45-55											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Short**

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
6.0	13	57	6	4	0.009	<b>225001</b> 0060	17,60	<b>225010</b> 0060	19,75
8.0	19	69	10	4	0.014	225001 0080	19,65	225010 0080	22,50
10.0	22	72	10	4	0.018	225001 0100	19,65	225010 0100	23,10
12.0	26	83	12	4	0.022	225001 0120	25,30	225010 0120	26,90
14.0	26	83	12	4	0.022	225001 0140	29,-	225010 0140	39,40
16.0	32	92	16	4	0.027	225001 0160	32,80	225010 0160	38,40
18.0	32	92	16	4	0.027	225001 0180	36,90	225010 0180	49,30
20.0	38	104	20	4	0.033	225001 0200	45,40	225010 0200	50,60
22.0	38	104	20	5	0.033	225001 0220	64,70	225010 0220	67,70
25.0	45	121	25	5	0.04	225001 0250	68,90	225010 0250	70,70
28.0	45	121	25	5	0.045	225001 0280	88,40	225010 0280	90,60
30.0	45	121	25	5	0.05	225001 0300	91,90	225010 0300	104,-
32.0	53	133	32	6	0.055	225001 0320	106,50	225010 0320	110,-
36.0	53	133	32	6	0.06	225001 0360	139,-		
40.0	63	155	40	6	0.065	225001 0400	152,-		
						2105		2105	



**Long**

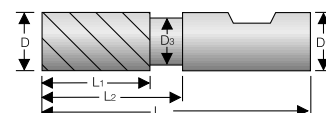
D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
6.0	24	68	6	4	0.009	<b>225015</b> 0060	24,90	<b>225025</b> 0060	30,50
8.0	38	88	10	4	0.014	225015 0080	38,60	225025 0080	46,70
10.0	45	95	10	4	0.018	225015 0100	40,90	225025 0100	49,60
12.0	53	110	12	4	0.022	225015 0120	54,-	225025 0120	65,50
14.0	53	110	12	4	0.022	225015 0140	51,40	225025 0140	63,10
16.0	63	123	16	4	0.027	225015 0160	65,10	225025 0160	78,70
18.0	63	123	16	4	0.027	225015 0180	78,90	225025 0180	95,50
20.0	75	141	20	4	0.033	225015 0200	101,-	225025 0200	123,50
22.0	75	141	20	4	0.033	225015 0220	121,50	225025 0220	149,50
25.0	90	166	25	5	0.04	225015 0250	143,50	225025 0250	173,-
28.0	90	166	25	5	0.045	225015 0280	179,-	225025 0280	217,-
30.0	90	166	25	5	0.05	225015 0300	191,50	225025 0300	236,-
32.0	106	186	32	6	0.055	225015 0320	204,-	225025 0320	250,-
36.0	106	186	32	6	0.06	225015 0360	245,-		
40.0	125	217	32	6	0.07	225015 0400	275,-		
						2105		2105	



## SARA® Roughing cutter

HSS-E PM
DIN 844HR
HR
45°
DIN 1835 B
Z 3
Z 4
Z 5
Z 6
TiAlN
Vc/fz
752

• Eccentric relief grinding



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	○		●	○								○		
		45-75	45-65	30-45	30-45	30-45		25-45	25-45								20-35		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 h6 mm	L2 mm	D3 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4.0	11	55	6	19	4.0	3	0.008	0.014	226247 0040	29,70
5.0	13	57	6	21	4.8	4	0.008	0.014	226247 0050	30,50
6.0	13	57	6	21	5.5	4	0.012	0.021	226247 0060	30,60
8.0	19	69	10	29	7.5	4	0.014	0.0245	226247 0080	35,50
10.0	22	72	10	32	9.5	5	0.0232	0.0406	226247 0100	38,80
12.0	26	83	12	38	11.5	5	0.024	0.042	226247 0120	49,-
16.0	32	92	16	44	15.5	5	0.046	0.0805	226247 0160	72,50
20.0	38	104	20	54	19.5	6	0.046	0.0805	226247 0200	109,-
25.0	45	121	25	65	12.5	6	0.046	0.0805	226247 0250	152,50

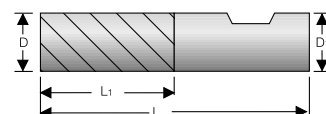


2105

## SARA® Aluminium roughing cutter

HSS-E
DIN 844
WR
30°
DIN 1835 B
Z 3
Vc/fz
749

• Aluminium teeth



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													●	●	○				
													70-85	35-45	30-35				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	13	57	6	0.013	290963 0060	24,60
8.0	19	69	10	0.019	290963 0080	26,30
10.0	22	72	10	0.025	290963 0100	26,30
12.0	26	83	12	0.03	290963 0120	35,30
14.0	26	83	12	0.03	290963 0140	39,50

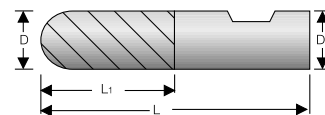
2105

D mm	L1 mm	L mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16.0	32	92	16	0.038	290963 0160	44,-
18.0	32	92	16	0.045	290963 0180	47,70
20.0	38	104	20	0.05	290963 0201	59,50
25.0	45	121	25	0.055	290963 0250	92,10
30.0	45	121	25	0.06	290963 0300	130,50

2105

# ATORN® Radius milling cutter

HSS-E
DIN 844
Typ N
30°
DIN 1835 B
Z 2
Vc/fz
749



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Cu-alloy	GRP/EPF/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●		○	○		○	○				○	○	○					
		28	23		12	16		25	25				162	50	40					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L mm	D1 mm	R mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	52	6	1.5	0.004	221001 0030	16,60
4.0	11	55	6	2	0.01	221001 0040	16,60
5.0	13	57	6	2.5	0.01	221001 0050	16,60
6.0	13	57	6	3	0.014	221001 0060	16,60
8.0	19	69	10	4	0.022	221001 0080	19,45
10.0	22	72	10	5	0.036	221001 0100	21,20

2106

D mm	L1 mm	L mm	D1 mm	R mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
12.0	26	83	12	6	0.05	221001 0120	27,-
14.0	26	83	12	7	0.05	221001 0140	29,80
16.0	32	92	16	8	0.062	221001 0160	33,40
18.0	32	92	16	9	0.064	221001 0180	38,-
20.0	38	104	20	10	0.07	221001 0200	43,50

2106

## Long

D mm	L1 mm	L mm	D1 mm	R mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	56	6	1.5	0.003	221005 0030	13,10
4.0	19	63	6	2	0.01	221005 0040	18,65
5.0	24	68	6	2.5	0.01	221005 0050	18,65
6.0	24	68	6	3	0.012	221005 0060	18,65
8.0	38	82	10	4	0.02	221005 0080	22,50
10.0	45	95	10	5	0.034	221005 0100	24,20

2106

D mm	L1 mm	L mm	D1 mm	R mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
12.0	53	110	12	6	0.048	221005 0120	31,30
14.0	53	110	12	7	0.048	221005 0140	34,10
16.0	63	123	16	8	0.058	221005 0160	38,60
18.0	63	123	16	9	0.06	221005 0180	43,40
20.0	75	141	20	10	0.068	221005 0200	49,80

2106

SOLID CARBIDE MILLING CUTTERS  
**AT THEIR BEST**



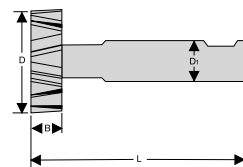
**VAN HOORN**  
End milling cutters  
189 pages  
Art.no. 019900 0079

Overview of all free manufacturers' catalogues on page 16/17

## SARA® Slotting cutter

HSS-E
DIN 850
Typ N
h12
h6
DIN 1835 B
Z 6
Z 8+
Vc/fz
749

- With cross-cut toothing
- For groove milling in accordance with DIN 6888, P9 fit
- \* = not DIN-compliant



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		30-40	25-35		20-30	20-30		20-30	20-30					35-55	65-250				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D h12	B	for DIN 6888-compliant groove mm	L	D1	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4.5	1	1 x 1.4	50	6	6	0.045	291360 0045	35,20
7.5	1.5	1.5 x 2.6	50	6	6	0.045	291360 0075	28,10
7.5	2	2 x 2.6	50	6	6	0.045	291360 0076	28,10
10.5	2	2 x 3.7	50	6	6	0.045	291360 0105	35,70
10.5	2.5	2.5 x 3.7	50	6	6	0.045	291360 0106	35,70
10.5	3	3 x 3.7	50	6	6	0.045	291360 0107	35,70
13.5	2	2 x 5	56	10	6	0.06	291360 0135	34,10
13.5	3	3 x 5	56	10	6	0.06	291360 0137	34,10
13.5	4	4 x 5	56	10	6	0.06	291360 0138	34,10
16.5	3	3 x 6.5	56	10	6	0.06	291360 0166	37,20
16.5	4	4 x 6.5	56	10	6	0.06	291360 0167	37,20
16.5	5	5 x 6.5	56	10	6	0.06	291360 0168	37,20
19.5	3	3 x 7.5*	63	10	8	0.06	291360 0195	43,30
19.5	4	4 x 7.5	63	10	8	0.06	291360 0196	43,30
19.5	5	5 x 7.5	63	10	8	0.06	291360 0197	43,30
19.5	6	6 x 7.5	63	10	8	0.06	291360 0198	43,30

2107

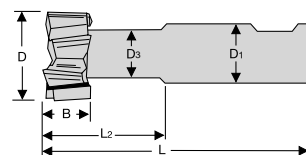
D h12	B	for DIN 6888-compliant groove mm	L	D1	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
22.5	4	4 x 9	63	10	8	0.08	291360 0225	50,90
22.5	5	5 x 9	63	10	8	0.08	291360 0226	50,90
22.5	6	6 x 9	63	10	8	0.08	291360 0227	50,90
22.5	8	8 x 9	63	10	8	0.08	291360 0228	50,90
25.5	5	5 x 10*	63	10	10	0.08	291360 0255	55,40
25.5	6	6 x 10	63	10	10	0.08	291360 0256	55,40
28.5	6	6 x 11	63	10	10	0.08	291360 0286	64,90
28.5	8	8 x 11	63	10	10	0.08	291360 0288	64,90
28.5	10	10 x 11	71	12	10	0.08	291360 0289	64,90
32.5	6	6 x 13*	71	12	10	0.09	291360 0326	68,20
32.5	7	*	71	12	10	0.09	291360 0327	68,20
32.5	8	8 x 13	71	12	10	0.09	291360 0328	68,20
32.5	10	10 x 13	71	12	10	0.09	291360 0329	68,20
38.5	8	*	71	12	10	0.09	291360 0385	80,90
45.5	8	8 x 16*	71	12	12	0.09	291360 0454	96,70
45.5	10	10 x 16	71	12	12	0.09	291360 0455	96,70

2107

## SARA® T-slot milling cutter

HSS-E
DIN 851
Typ N
d11
h6
DIN 1835 B
Z 6
Z 8+
Vc/fz
749

- With cross-cut toothing
- \* = not DIN-compliant



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		30-40	25-35		20-30	20-30		20-30	20-30					35-55	65-250				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



for DIN 650-compliant T-slot	B	D	L2	L	D1	D3	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
M5	4	11.0	13.5	53.5	10	4	6	0.06	291365 0040	54,50
M 6	6	12.5	17.0	57	10	5	6	0.06	291365 0060	54,50
M 8	8	16.0	22.0	62	10	7	6	0.06	291365 0080	57,-
M10	8	18.0	25.0	70	12	8	6	0.06	291365 0100	59,-
*	9	19.0	26.0	71	12	8	6	0.08	291365 0110	61,60
M12	9	21.0	29.0	74	12	10	6	0.08	291365 0120	64,10
*	10	22.0	30.0	75	12	10	6	0.08	291365 0130	66,70
M14	11	25.0	34.0	82	16	12	8	0.08	291365 0140	70,20

2107

for DIN 650-compliant T-slot	B	D	L2	L	D1	D3	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
M16	12	28.0	37.0	85	16	13	8	0.08	291365 0160	84,50
M18	14	32.0	42.0	90	16	15	8	0.09	291365 0180	89,-
M20	16	36.0	47.0	103	25	17	8	0.09	291365 0200	120,50
M22	18	40.0	52.0	108	25	19	10	0.09	291365 0220	155,-
M24	20	45.0	57.0	113	25	21	10	0.11	291365 0240	188,50
M28	22	50.0	64.0	124	32	25	10	0.13	291365 0250	224,-
M36	28	60.0	79.0	139	32	30	10	0.2	291365 0260	275,-

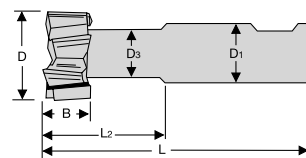
2107



## SARA® T-slot milling cutter

HSS-E
DIN 851
NR
d11
h6
DIN 1835 B
Z 6
Z 8+
Vc/fz
749

- With cross-cut toothing
- \* = not DIN-compliant



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
		30-40	25-35		20-30	20-30		20-30	20-30				35-55	65-250						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

for DIN 650-compliant T-slot	B mm	D mm	L2 mm	L mm	D1 mm	D3 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
M 6	6	12.5	17.0	57	10	5	6	0.06	291367 0125	60,10
M 8	8	16.0	22.0	62	10	7	6	0.06	291367 0160	63,60
M10	8	18.0	25.0	70	12	8	6	0.06	291367 0180	66,70
*	9	19.0	26.0	71	12	8	6	0.08	291367 0190	68,70
M12	9	21.0	29.0	74	12	10	6	0.08	291367 0210	71,20
*	10	22.0	30.0	75	12	10	6	0.08	291367 0220	74,30
M14	11	25.0	34.0	82	16	12	8	0.08	291367 0250	77,90
M16	12	28.0	37.0	85	16	13	8	0.08	291367 0280	94,10
M18	14	32.0	42.0	90	16	15	8	0.09	291367 0320	98,70
M20	16	36.0	47.0	103	25	17	8	0.09	291367 0360	135,50
M22	18	40.0	52.0	108	25	19	8	0.09	291367 0400	173,-



2107

## SARA® Angle milling cutter

HSS-E
DIN 1833
Typ N
js16
h6
DIN 1835 B
Z 8+
Vc/fz
749

- Type N, 45° and 60°
- Straight-fluted

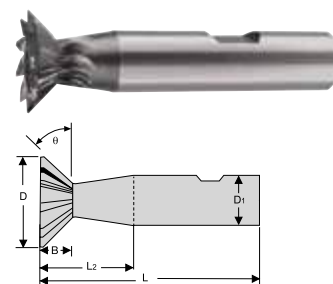
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
		30-40	25-35		20-30	20-30		20-30	20-30				35-55	65-250						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Form C, 45°

D mm	θ	B mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
16.0	45°	4	15	60	12	10	0.06	291392 0160	42,10
20.0	45°	5	18	63	12	10	0.08	291392 0200	53,10
25.0	45°	6.3	22	67	12	10	0.08	291392 0250	65,10
32.0	45°	8	23	71	16	12	0.09	291392 0320	89,-

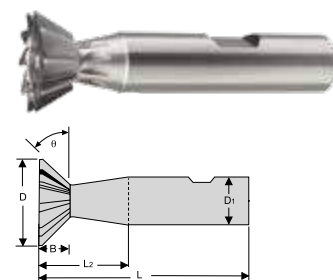
2107



### Form C, 60°

D mm	θ	B mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
16.0	60°	6.3	15	60	12	10	0.06	291393 0160	42,10
20.0	60°	8	18	63	12	10	0.08	291393 0200	53,10
25.0	60°	10	22	67	12	10	0.08	291393 0250	65,10
32.0	60°	12.5	23	71	16	12	0.09	291393 0320	89,-

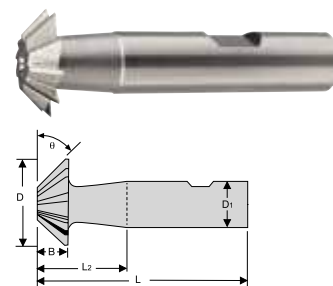
2107



**Form D, 45°**

D mm	θ	B mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
16.0	45°	4	15	60	12	10	0.06	291394 0160	42,10
20.0	45°	5	18	63	12	10	0.08	291394 0200	53,10
25.0	45°	6.3	22	67	12	10	0.08	291394 0250	65,10
32.0	45°	8	23	71	16	12	0.09	291394 0320	89,-

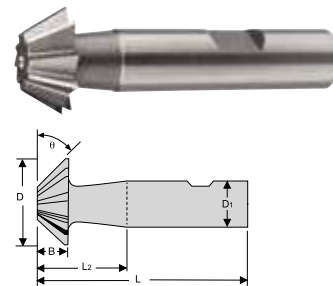
2107



**Form D, 60°**

D mm	θ	B mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
16.0	60°	6.3	15	60	12	10	0.06	291395 0160	42,10
20.0	60°	8	18	63	12	10	0.08	291395 0200	53,10
25.0	60°	10	22	67	12	10	0.08	291395 0250	65,10
32.0	60°	12.5	23	71	16	12	0.09	291395 0320	89,-

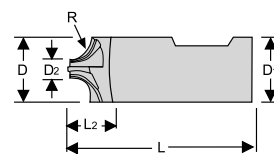
2107



**SARA® Quadrant milling cutter, concave**

HSS-E
DIN 6518
Typ N
h11
h6
DIN 1835 B
Z 4
Z 6
Vc/fz 749

- Radially / axially relieved
- Cutting edge angle (axial) approx. 5°
- Straight shank in accordance with DIN 1835 B, up to shank Ø 16 mm with additional driving planes



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	G6/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		25-35	30					20-30	20-30				60-100	45-70						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



R mm	D mm	D2 mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
1.0	8.0	6	20	60	10.0	4	0.002	291304 0010	42,60
1.5	10.0	6	20	60	9.0	4	0.002	291304 0015	42,60
1.6	9.2	6	20	60	10.0	4	0.002	291304 0016	42,60
2.0	10.0	6	20	60	10.0	4	0.003	291304 0020	42,60
2.5	11.0	6	20	60	10.0	4	0.003	291304 0025	42,60
3.0	12.0	6	15	60	12.0	4	0.003	291304 0030	42,60
3.5	12.0	6	15	60	13.0	4	0.003	291304 0035	45,50
4.0	14.0	6	15	60	12.0	4	0.004	291304 0040	45,50
4.5	15.0	6	15	60	12.0	4	0.004	291304 0045	53,70
5.0	16.0	6	15	60	12.0	4	0.004	291304 0050	53,70
6.0	20.0	8	19	67	16.0	4	0.006	291304 0060	62,90
6.5	21.0	8	23	71	16.0	4	0.006	291304 0065	71,60
7.0	22.0	8	23	71	16.0	4	0.006	291304 0070	71,60
7.5	23.0	8	23	71	16.0	4	0.009	291304 0075	71,60

2107






R mm	D mm	D2 mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
8.0	24.0	8	23	71	16.0	4	0.009	291304 0080	71,60
8.5	25.0	8	29	85	25.0	4	0.009	291304 0085	93,40
9.0	26.0	8	29	85	25.0	4	0.009	291304 0090	93,40
10.0	28.0	8	29	85	25.0	4	0.014	291304 0100	93,40
10.5	31.0	10	34	90	25.0	4	0.014	291304 0105	118,50
11.0	32.0	10	34	90	25.0	4	0.018	291304 0110	118,50
12.0	34.0	10	34	90	25.0	4	0.021	291304 0120	118,50
12.5	41.0	16	44	100	25.0	6	0.021	291304 0125	167,-
13.0	42.0	16	44	100	25.0	6	0.021	291304 0130	167,-
14.0	44.0	16	44	100	25.0	6	0.023	291304 0140	167,-
15.0	46.0	16	44	100	25.0	6	0.023	291304 0150	197,50
16.0	48.0	16	44	100	25.0	6	0.025	291304 0160	191,50
18.0	52.0	16	52	112	32.0	6	0.028	291304 0180	197,50
20.0	56.0	16	52	112	32.0	6	0.03	291304 0200	239,-

2107

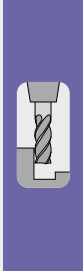
## Overview of solid carbide end milling cutters







Sorting by type and number of cutting edges	End milling cutters				
					
Brand	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>
ISO	<b>P M K S N H</b>	<b>P M K N</b>	<b>P M K S N H</b>	<b>P M K S N H</b>	<b>P M K</b>
Number of cutting edges	2	2	3	3	3
Diameter range / mm	0.3 - 20.0	2.0 - 20.0	0.5 - 20.0	0.5 - 20.0	2.0 - 20.0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Short	Short	Extra-short	Extra-short	Short
Type/profile	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN Ultra	TiAlN	TiAlN Ultra	TiAlN Ultra	TiAlN
Order No.	254050....	250109....	251006....	251009....	251056....
<b>Catalogue page</b>	<b>466</b>	<b>467</b>	<b>468</b>	<b>468</b>	<b>469</b>






Sorting by type and number of cutting edges	End milling cutters					
						
Brand	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>
ISO	<b>P M K N</b>	<b>P M K N H</b>	HPC <b>P M K S N H</b>	HPC <b>P M K S N H</b>	<b>P M K S N H</b>	HSC <b>P M K S N H</b>
Number of cutting edges	3	3	4	4	4	4
Diameter range / mm	3.0 - 20.0	3.0 - 20.0	2.0 - 20.0	3.0 - 16.0	3.0 - 20.0	3.0 - 20.0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Short	Normal	Normal	Extra-long	Short	Long
Type/profile	N	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN Ultra	TiAlN	TiAlN Ultra	TiAlN Ultra	TiAlN	TiAlN
Order No.	254052....	251033....	254054....	254056....	251516....	251517....
<b>Catalogue page</b>	<b>470</b>	<b>469</b>	<b>471</b>	<b>471</b>	<b>472</b>	<b>472</b>






Sorting by type and number of cutting edges	End milling cutters				
					
Brand	<b>SARA</b>	<b>VAN HOORN CARBIDE</b>	<b>VAN HOORN CARBIDE</b>	<b>SARA</b>	<b>SARA</b>
ISO	<b>P M K N</b>	<b>P M K</b>	<b>P M K</b>	HSC <b>P M K S H</b>	HSC <b>P M K S H</b>
Number of cutting edges	4	4	5	6 - 8	6
Diameter range / mm	4.0 - 20.0	2.0 - 25.0	2.0 - 25.0	4 - 20	6 - 25
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	standard	Normal	Normal	Normal	Extra-long
Type/profile	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlCrN	TiAlN	TiAlN	TiAlN Ultra	TiAlN
Order No.	254111....	255100....	255101....	254058....	254109....
<b>Catalogue page</b>	<b>473</b>	<b>473</b>	<b>474</b>	<b>475</b>	<b>475</b>

	Roughing cutter				Torus milling cutters		
Sorting by type and number of cutting edges							
	<b>SARA</b>	<small>VHM HOORN CARBIDE</small>	<b>SARA</b>	<b>ATORN</b>	<b>SARA</b>	<b>SARA</b>	
Brand			HPC			HSC	
ISO	<b>P K H</b>	<b>P N H</b>	<b>P K H</b>	<b>P M K S</b>	<b>P M K S H</b>	<b>P M K S H</b>	<b>P H</b>
Number of cutting edges	3 - 5	3 - 4	2	4	2	4	4 - 5
Diameter range / mm	6 - 20	6 - 20	5 - 20	4 - 20	3 - 20	3 - 20	6 - 12
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Short	Short	Short	Short	Long	Long	Short - Long
Type/profile	HR	NR	N	NR	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN	TiAlN Ultra	AlCrN	TiAlN	TiAlN	TiAlN
Order No.	254018....	254015....	254090....	254030....	254017....	254019....	294248.... 294249....
<b>Catalogue page</b>	<b>476</b>	<b>476</b>	<b>477</b>	<b>477</b>	<b>478</b>	<b>478</b>	<b>479</b>





	Radius milling cutters					
Sorting by type and number of cutting edges						
	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>
Brand						
ISO	<b>P M K N</b>	<b>P M K S H</b>	<b>P M K S H</b>	<b>P M K N</b>	<b>P M K S H</b>	<b>P K H</b>
Number of cutting edges	2	2	2	4	4	2
Diameter range / mm	3 - 20	1 - 20	2 - 20	3 - 20	1 - 20	1 - 16
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Short	Long	Extra-long	Short	Extra-long	Short
Type/profile	N	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	VHM
Coating	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	AlTiN
Order No.	250515....	254011....	254112....	251532....	254013....	250510....
<b>Catalogue page</b>	<b>480</b>	<b>481</b>	<b>481</b>	<b>482</b>	<b>482</b>	<b>483</b>

	Ranges of milling cutters				
Sorting by type and number of cutting edges					
	<b>SARA</b>	<b>ATORN</b>	<b>SARA</b>	<b>ATORN</b>	
Brand	HPC	HPC	Trochoidal	aluminium	Stainless steel and titanium range
ISO	<b>P M K S N H</b>	<b>P M K S N</b>	<b>P M K S N H</b>	<b>N</b>	<b>P M K S</b>
Number of cutting edges	4	3 - 4	3 - 8	1 - 4	2 - 4
Diameter range / mm	3.0 - 25.0	4.0 - 20.0	3 - 20	0.5 - 20.0	0.2 - 20.0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Short - extra-long	Normal	Normal	Short - extra-long	Short - long
Type/profile	N / NA	N	N / H	W / WR	N / H
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN / AlTiN	TiAlN	TiAlSiN	ZrCN	AlCrN
Order No.	From 254130....	From 254503....	From 254155....	From 249001....	From 256011....
<b>Catalogue page</b>	<b>Overview 484</b>	<b>Overview 492</b>	<b>Overview 495</b>	<b>Overview 499</b>	<b>Overview 525</b>

	Ranges of milling cutters				
Sorting by type and number of cutting edges					
	<b>SARA</b>	<b>palbit</b>	<b>ATORN</b>	<b>ATORN</b>	<b>ATORN</b>
Brand	DIA+	PKD	Composite materials	RockTec 52 and 65	RockTec Pro
ISO	<b>N</b>	<b>N</b>	<b>N</b>	<b>P S H</b>	<b>P H</b>
Number of cutting edges	2 - 4	1 - 3		2 - 8	2 - 8
Diameter range / mm	1 - 16	3 - 10	4 - 20	0.1 - 20.0	0,1 - 20
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Short - long	standard - extra-long	long	Short - long	Short - long
Type/profile	N	-	-	N / H	N / H
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	DIA+		DIA HC	TiSi	TiAlSiN
Order No.	From 258005....	253025....	From 250600....	From 257002....	From 257100....
<b>Catalogue page</b>	<b>Overview 534</b>	<b>540</b>	<b>Overview 541</b>	<b>Overview 533</b>	<b>Overview 580</b>

	Sealing surface milling cutter	Ceramics milling cutter	Circle segment milling cutter	Die-sinking cutter	Quadrant milling cutter
Sorting by type and number of cutting edges					
	<b>ATORN</b>	<b>ATORN</b>	<b>ATORN</b>	<b>SARA</b>	<b>SARA</b>
Brand					
ISO	<b>P M K N H</b>	<b>S</b>	<b>P M K N H</b>	<b>P M K N H</b>	<b>P M K S N H</b>
Number of cutting edges	3	4	4	3 - 4	4
Diameter range / mm	3 - 20	6 - 20	2 - 8	2.5 - 8.0	8 - 16
Standard	WN	WN	WN	Factory standard	Factory standard
Version	Short	Normal	Normal	Short / long	Short
Type/profile	N	N	N	N	N
Cutting material	Solid carbide	Ceramics	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN		TiAlN	TiAlN	AlCrN
Order No.	255151/255152	255153	254170 - 254173	253002....	291310....
<b>Catalogue page</b>	<b>597</b>	<b>598</b>	<b>599</b>	<b>600</b>	<b>601</b>

	Form milling cutters	Engraving milling cutter	Multifunction tool	Deburring tools	
Sorting by type and number of cutting edges					
Brand	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	<b>SARA</b>	
ISO	<b>P K</b>	<b>N</b>	<b>P M K S N</b>	<b>P M K S N H</b>	Forward and reverse deburring tool <b>P M K S N H</b>
Number of cutting edges	6 - 10	1	2	3 - 6	3 - 4
Diameter range / mm	10 - 45	3 - 6	0.5 - 20	1 - 16	1.5 - 12
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Short	Short	Normal	Short	Normal
Type/profile	N	N	N	N	N / H
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlCN		TiAlN	TiAlN	TiAlN
Order No.	292004....	251545....	251541/46/49....	251550....	2981320.... 250004/05/06....
Catalogue page	<b>601</b>	<b>602</b>	<b>603</b>	<b>604</b>	<b>605</b>

## End milling cutters HSS and solid carbide

**INFO**

## Solid carbide

Cutting tools that are made entirely of carbide, compared with coated tools or tools composed of various materials, are classified as **solid carbide** or SC.

**Universal**  
primarily for ISO P

**Page 466**

**Stainless steel / superalloys**  
primarily for ISO M

**Page 525**

**Aluminium**  
primarily for ISO N

**Page 499**

**Graphite**  
primarily for ISO N

**Page 534**

**Composites**  
primarily for ISO N

**Page 541**

**Hard materials**  
primarily for ISO H

**Page 553**

## Solid carbide milling cutter range

for modern **milling strategies**.

**HPC**

**Page 484**

**HPC Power**

**Page 492**

**Trochoidal**

**Page 495**

**Form milling cutters and  
deburring tools**

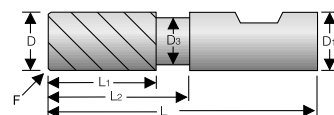
**from Page 601**



# SARA® Slot milling cutter



- **With clearance**
- Straight shank up to Ø 2.5 mm smooth, from Ø 2.8 mm with driving planes in accordance with DIN 6535-HB
- **Optimum chip removal due to extremely smooth surface**
- **For P9 grooves**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		100-120	80-100	60-80	50-65	50-60	40-50	100-130	80-120	40-60	40-50	30-40	300-400	200-300	100-140					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L2	L	D1	D3	F x 45°	Feed fz steel < 1400 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1400 N/mm <sup>2</sup> mm/tooth	art.no.	€
1.0	3	-	50	3.0	-	-	0.006	0.007	254050 0010	31,90
1.1	3	-	50	3.0	-	-	0.006	0.007	254050 0011	31,90
1.2	4	-	50	3.0	-	-	0.006	0.007	254050 0012	31,90
1.4	4	-	50	3.0	-	-	0.006	0.007	254050 0014	31,90
1.5	4	-	50	3.0	-	-	0.006	0.007	254050 0015	31,90
1.6	4	-	50	3.0	-	-	0.006	0.007	254050 0016	31,90
1.8	5	-	50	3.0	-	-	0.006	0.007	254050 0018	31,90
2.0	5	-	50	3.0	-	0.05	0.006	0.007	254050 0020	31,90
2.5	6	-	50	3.0	-	0.05	0.012	0.015	254050 0025	31,90
2.8	8	15	57	6.0	2.6	0.05	0.012	0.015	254050 0028	27,-
3.0	8	15	57	6.0	2.8	0.05	0.012	0.015	254050 0030	27,-
3.8	11	15	57	6.0	3.6	0.1	0.012	0.015	254050 0038	27,-
4.0	11	15	57	6.0	3.8	0.1	0.012	0.015	254050 0040	27,-
4.8	13	21	57	6.0	4.6	0.1	0.024	0.030	254050 0048	28,60
5.0	13	21	57	6.0	4.8	0.1	0.024	0.030	254050 0050	28,60
5.8	13	21	57	6.0	5.6	0.1	0.024	0.030	254050 0058	28,60
6.0	13	21	57	6.0	5.8	0.1	0.024	0.030	254050 0060	28,60
6.8	16	27	63	8.0	6.6	0.1	0.024	0.030	254050 0068	33,40
7.0	16	27	63	8.0	6.8	0.1	0.024	0.030	254050 0070	33,-
7.8	19	27	63	8.0	7.5	0.1	0.024	0.030	254050 0078	32,70
8.0	19	27	63	8.0	7.7	0.1	0.024	0.030	254050 0080	32,40
8.7	19	32	72	10.0	8.5	0.1	0.032	0.040	254050 0087	47,30
9.0	19	32	72	10.0	8.8	0.1	0.032	0.040	254050 0090	47,30
9.7	22	32	72	10.0	9.5	0.1	0.032	0.040	254050 0097	47,30
10.0	22	32	72	10.0	9.8	0.1	0.032	0.040	254050 0100	47,30
10.7	26	38	83	12.0	10.5	0.1	0.032	0.040	254050 0107	68,20
11.0	26	38	83	12.0	10.8	0.1	0.032	0.040	254050 0110	68,20
11.7	26	38	83	12.0	11.5	0.1	0.032	0.040	254050 0117	68,20
12.0	26	38	83	12.0	11.8	0.1	0.032	0.040	254050 0120	68,20
13.7	26	38	83	14.0	13.5	0.1	0.040	0.050	254050 0137	84,-
14.0	26	38	83	14.0	13.8	0.1	0.040	0.050	254050 0140	84,-
15.7	32	44	92	16.0	15.4	0.1	0.040	0.050	254050 0157	109,-
16.0	32	44	92	16.0	15.7	0.1	0.040	0.050	254050 0160	109,-
17.7	32	44	92	18.0	17.4	0.1	0.048	0.060	254050 0177	148,50
18.0	32	44	92	18.0	17.7	0.1	0.048	0.060	254050 0180	131,50
19.7	38	54	104	20.0	19.4	0.1	0.048	0.060	254050 0197	188,50
20.0	38	54	104	20.0	19.7	0.1	0.048	0.060	254050 0200	167,-

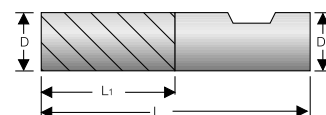


2145

**SARA® Basic-Line longitudinal slot drill**

VHM  30°  e8  h5  DIN 6535 HB  Z 2  TiAlN  Vc/fz **753**

- **2 cutting edges, short**, 30° right-hand cutting
- Eccentric relief grinding
- **Cutting material: superfine grain solid carbide**



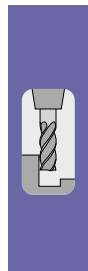
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Co-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		●	●	●	○	○		●	●	○	○		●	●	●					
		180	80	100	80	90		140	100	70	50		270	190	150					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Z	Feed fz		art.no.	€
					steel < 1000 N/mm² mm/tooth	steel < 1000 N/mm² mm/tooth		
2.0	6	50	6.0	2	0.011	0.016	<b>250109 0020</b>	<b>10,15</b>
3.0	6	50	6.0	2	0.011	0.016	250109 0030	10,15
4.0	8	50	6.0	2	0.017	0.026	250109 0040	10,15
5.0	8	50	6.0	2	0.017	0.026	250109 0050	10,15
6.0	16	50	6.0	2	0.021	0.032	250109 0060	10,15
8.0	20	60	8.0	2	0.029	0.044	250109 0080	12,85
10.0	22	70	10.0	2	0.040	0.060	250109 0100	19,25
12.0	22	70	12.0	2	0.040	0.060	250109 0120	27,10
16.0	25	75	16.0	2	0.053	0.080	250109 0160	45,40
20.0	32	100	20.0	2	0.067	0.1	250109 0200	77,30



**Staggered prices in online shop**



2148

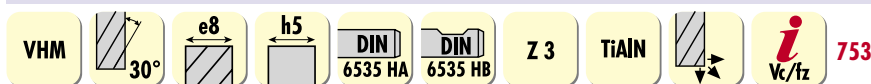
**YOUR DRILL**  
**GIVES UP.** • **WHAT DO YOU DO? YOU REACH**  
**FOR A NEW ONE**

**AND SIMPLY CARRY ON:**  
**SARA®GO TOOL DISPENSING SYSTEM.**

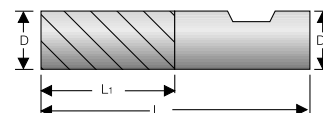
**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
 A BRAND OF SARTORIUS WERKZEUGE

## SARA® Mini end milling cutter



- Straight shank with driving plane, up to  $\varnothing$  1.8 mm smooth
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**
- **Note:** This milling cutter is not cost-effective to re-sharpen. It is more economical to use the cutters up to their wear limit and replace them with brand new tools.



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
251006....	●	●	●	●	●	○	●	●	●	●	●	●	●	●				
251009....	●	●	●	●	●	○	●	●	●	●	●	●	●	●				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Feed fz		art.no.	€	TiAlN	
				steel < 1000 N/mm <sup>2</sup> mm/tooth	steel < 1000 N/mm <sup>2</sup> mm/tooth			art.no.	€
0.5	2.0	38.0	3.0	0.012	0.015	251006 0005	12,45	251009 0005	18,75
0.6	2.0	38.0	3.0	0.012	0.015	251006 0006	12,45	251009 0006	18,75
0.8	2.0	38.0	3.0	0.012	0.015	251006 0008	12,45	251009 0008	18,75
1.0	2.0	38.0	3.0	0.012	0.015	251006 0010	12,45	251009 0010	18,75
1.2	2.0	38.0	3.0	0.012	0.015	251006 0012	12,45	251009 0012	18,75
1.5	2.0	38.0	3.0	0.012	0.015	251006 0015	12,45	251009 0015	18,75
1.8	2.0	38.0	3.0	0.012	0.015	251006 0018	12,45	251009 0018	18,75
2.0	4.0	35.0	6.0	0.012	0.015	251006 0020	12,40	251009 0020	18,75
2.5	4.0	35.0	6.0	0.023	0.03	251006 0025	13,10	251009 0025	18,75
3.0	5.0	36.0	6.0	0.031	0.038	251006 0030	12,40	251009 0030	18,75
3.5	5.0	36.0	6.0	0.040	0.045	251006 0035	13,10	251009 0035	20,30
4.0	7.0	38.0	6.0	0.048	0.052	251006 0040	12,40	251009 0040	19,05
4.5	7.0	38.0	6.0	0.050	0.056	251006 0045	13,10	251009 0045	20,30
5.0	8.0	39.0	6.0	0.051	0.057	251006 0050	12,40	251009 0050	18,75
5.5	8.0	39.0	6.0	0.053	0.06	251006 0055	13,10	251009 0055	20,30
5.75	8.0	39.0	6.0	0.053	0.06	251006 0057	13,10	251009 0057	20,30
6.0	8.0	39.0	6.0	0.054	0.06	251006 0060	12,40	251009 0060	18,75
6.75	11.0	43.0	8.0	0.056	0.062	251006 0067	17,30	251009 0067	25,-
7.0	11.0	43.0	8.0	0.057	0.062	251006 0070	16,50	251009 0070	23,10
7.75	11.0	43.0	8.0	0.059	0.066	251006 0077	17,40	251009 0077	25,10
8.0	11.0	43.0	8.0	0.060	0.066	251006 0080	19,25	251009 0080	24,80
8.7	13.0	50.0	10.0	0.061	0.067	251006 0087	27,-	251009 0087	37,40
9.0	13.0	50.0	10.0	0.062	0.067	251006 0090	24,80	251009 0090	34,-
9.7	13.0	50.0	10.0	0.063	0.068	251006 0097	27,-	251009 0097	37,40
10.0	13.0	50.0	10.0	0.063	0.068	251006 0100	27,70	251009 0100	35,60
12.0	15.0	55.0	12.0	0.063	0.068	251006 0120	35,10	251009 0120	46,-



Over 200,000 tools available online!  
Register online now!

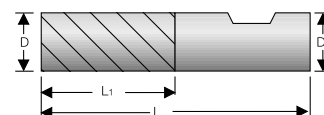


www.saratools.com

## SARA® Basic-Line end milling cutter

VHM 30° 753

- 3 cutting edges, short, 30° right-hand cutting
- Eccentric relief grinding
- Cutting material: superfine grain solid carbide



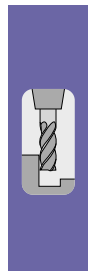
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	●	●		●	●		○	○	●	●	●					
		110	90	70	80	60		180	100		80	60	270	190	150					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L	D1	Z	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm		steel < 1000 N/mm²	steel < 1000 N/mm²		
					mm/tooth	mm/tooth		
3.0	6	50	6.0	3	0.012	0.016	251056 0030	10,20
4.0	8	50	6.0	3	0.019	0.026	251056 0040	10,20
5.0	8	50	6.0	3	0.019	0.026	251056 0050	10,20
6.0	16	50	6.0	3	0.024	0.032	251056 0060	10,20
8.0	20	60	8.0	3	0.033	0.044	251056 0080	12,90
10.0	22	70	10.0	3	0.044	0.060	251056 0100	19,30
12.0	22	70	12.0	3	0.044	0.060	251056 0120	27,20
16.0	25	75	16.0	3	0.059	0.080	251056 0160	45,50
20.0	32	100	20.0	3	0.074	0.100	251056 0200	77,50



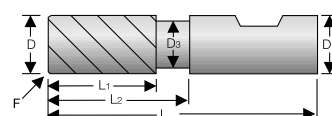
Staggered prices in online shop



## SARA® End milling cutters

VHM 45° 755

- With clearance
- First-rate chip removal due to extremely smooth surface
- Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	●	●	○	●	●	●	●	●	●	●	●					
		100-120	80-100	60-80	50-65	50-60	40-50	100-130	80-120	40-60	40-50	30-40	300-400	200-300	100-140					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L2	L	D1	D3	F x 45°	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	steel < 1400 N/mm²	steel < 1400 N/mm²		
							mm/tooth	mm/tooth		
3.0	8	15	57	6.0	2.8	0.1	0.012	0.015	254052 0030	30,20
3.5	11	15	57	6.0	3.3	0.1	0.012	0.015	254052 0035	31,90
4.0	11	15	57	6.0	3.8	0.1	0.012	0.015	254052 0040	29,40
4.5	13	21	57	6.0	4.3	0.1	0.024	0.03	254052 0045	31,90
5.0	13	21	57	6.0	4.8	0.1	0.024	0.03	254052 0050	29,40
5.5	13	21	57	6.0	5.3	0.1	0.024	0.03	254052 0055	31,90
6.0	13	21	57	6.0	5.8	0.1	0.024	0.03	254052 0060	29,40
6.5	16	27	63	8.0	6.3	0.1	0.024	0.03	254052 0065	39,30
7.0	16	27	63	8.0	6.8	0.1	0.024	0.03	254052 0070	38,60
7.5	19	27	63	8.0	7.3	0.1	0.024	0.03	254052 0075	37,-
8.0	21	27	63	8.0	7.7	0.1	0.024	0.03	254052 0080	37,60
8.5	21	32	72	10.0	8.3	0.1	0.032	0.04	254052 0085	59,-
9.0	21	32	72	10.0	8.8	0.1	0.032	0.04	254052 0090	57,50
9.5	22	32	72	10.0	9.3	0.1	0.032	0.04	254052 0095	63,60
10.0	22	32	72	10.0	9.8	0.1	0.032	0.04	254052 0100	55,-
11.0	26	32	83	12.0	10.8	0.1	0.032	0.04	254052 0110	88,50
12.0	26	38	83	12.0	11.8	0.1	0.032	0.04	254052 0120	81,90
14.0	26	38	83	14.0	13.8	0.1	0.04	0.05	254052 0140	103,-
16.0	36	44	92	16.0	15.7	0.1	0.04	0.05	254052 0160	139,50
18.0	36	44	92	18.0	17.7	0.1	0.048	0.06	254052 0180	171,-
20.0	41	54	104	20.0	19.7	0.1	0.048	0.06	254052 0200	219,-

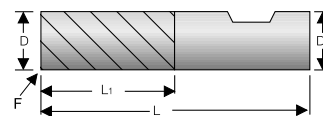


**SARA® End milling cutters**

VHM         **755**

- **38°/40°/42° right-hand helix**
- For universal applications
- **For roughing and finishing**
- For large cutting depths
- **Very high degree of smoothness**
- Protective chamfer for increased service life

**Universal**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●	●	●	●										
		240	160	85	75	220	110	180	140										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	F mm	Feed fz		art.no.	€
					steel < 1000 N/mm² mm/tooth	steel < 1000 N/mm² mm/tooth		
3	8	57	6	0.1	0.01	0.012	<b>251033 0030</b>	<b>29,50</b>
4	11	57	6	0.1	0.017	0.02	251033 0040	<b>28,50</b>
5	13	57	6	0.15	0.029	0.035	251033 0050	<b>32,40</b>
6	13	57	6	0.2	0.029	0.035	251033 0060	<b>32,60</b>
8	19	63	8	0.2	0.038	0.045	251033 0080	<b>43,80</b>
10	22	72	10	0.2	0.038	0.045	251033 0100	<b>57,50</b>
12	26	83	12	0.3	0.063	0.075	251033 0120	<b>80,90</b>
16	32	92	16	0.3	0.084	0.1	251033 0160	<b>126,50</b>
20	38	104	20	0.4	0.101	0.12	251033 0200	<b>194,50</b>



2145



Tangential is...

... highly economical.

**ATORN®**  
Performance demands quality

**SARA® End milling cutters**



- **With clearance**
- Straight shank in accordance with DIN 6535 HA and with driving plane in accordance with DIN 6535 HB
- **First-rate chip removal due to extremely smooth surface**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**

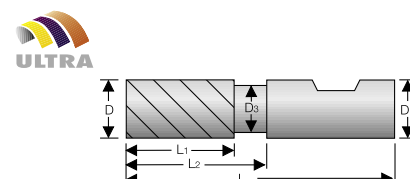
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc
		100-120	80-100	60-80	50-65	50-60	40-50	100-130	80-120	40-60	40-50	30-40	300-400	200-300	100-140			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Standard version**

- Smooth shank
- up to Ø 6 mm with driving planes in accordance with DIN 6535 HB

D mm	L1 mm	L2 mm	L mm	D1 mm	D3 mm	Feed fz		art.no.	€
						steel < 1400 N/mm² mm/tooth	steel < 1400 N/mm² mm/tooth		
2.0	8	-	32	2.0	-	0.0056	0.007	254054 0020	24,10
3.0	12	-	38	3.0	-	0.012	0.015	254054 0030	25,90
4.0	12	-	40	4.0	-	0.012	0.015	254054 0040	27,80
5.0	15	20	50	5.0	4.8	0.024	0.03	254054 0050	29,50
6.0	16	20	58	6.0	5.8	0.024	0.03	254054 0060	40,60
8.0	22	32	70	8.0	7.7	0.024	0.03	254054 0080	44,40
10.0	25	31	73	10.0	9.6	0.032	0.04	254054 0100	66,20
12.0	28	37	84	12.0	11.6	0.032	0.04	254054 0120	96,20
16.0	35	43	93	16.0	15.5	0.04	0.05	254054 0160	155,-
20.0	40	52	104	20.0	19.5	0.048	0.06	254054 0200	229,-

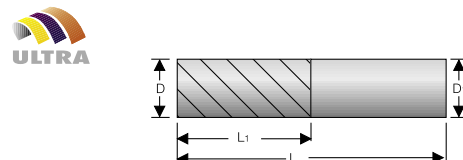


2145

**Extra-long without clearance**

- Smooth shank

D mm	L1 mm	L mm	D1 mm	Feed fz		art.no.	€
				steel < 1400 N/mm² mm/tooth	steel < 1400 N/mm² mm/tooth		
3.0	30	60	3.0	0.012	0.015	254056 0030	29,50
4.0	30	75	4.0	0.012	0.015	254056 0040	31,50
5.0	35	75	5.0	0.024	0.03	254056 0050	35,-
6.0	40	100	6.0	0.024	0.03	254056 0060	55,50
8.0	40	100	8.0	0.024	0.03	254056 0080	70,20
10.0	40	100	10.0	0.032	0.04	254056 0100	107,-
12.0	45	100	12.0	0.032	0.04	254056 0120	180,50
14.0	45	100	14.0	0.04	0.05	254056 0140	214,-
16.0	75	150	16.0	0.04	0.05	254056 0160	295,-



2145

**DRILLING  
THREADING  
MILLING**



**OSG**  
Catalogue VI  
1024 pages  
Art.no. 019900 0208

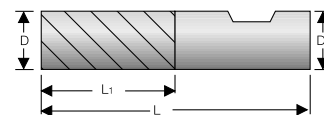
Overview of all free manufacturers' catalogues on page 16/17



### SARA® Basic-Line end milling cutter



- 4 cutting edges, long, 30° right-hand cutting
- Eccentric relief grinding
- Cutting material: superfine grain solid carbide



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Co-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		●	●	●	●	●		●	●		○	○	●	●	●					
		110	90	70	80	60		180	100		80	60	270	190	150					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Z	Feed fz		art.no.	€
					steel < 1000 N/mm² mm/tooth	steel < 1000 N/mm² mm/tooth		
3.0	8	57	6.0	4	0.012	0.015	251516 0030	13,45
4.0	11	57	6.0	4	0.012	0.015	251516 0040	13,45
5.0	13	57	6.0	4	0.024	0.030	251516 0050	13,45
6.0	13	57	6.0	4	0.024	0.030	251516 0060	13,45
8.0	19	63	8.0	4	0.024	0.030	251516 0080	15,05
10.0	22	72	10.0	4	0.032	0.040	251516 0100	24,40
12.0	26	83	12.0	4	0.032	0.040	251516 0120	34,80
14.0	26	83	14.0	4	0.038	0.042	251516 0140	54,-
16.0	32	92	16.0	4	0.040	0.050	251516 0160	58,50
20.0	38	104	20.0	4	0.048	0.060	251516 0200	100,50



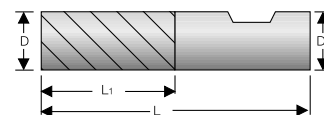
Staggered prices in online shop

2148

### SARA® Basic-Line end milling cutter



- 4 cutting edges, extra-long, 30° right-hand cutting
- Eccentric relief grinding
- Cutting material: fine grain solid carbide



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8% Si	≥8% Si	Co-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		●	●	●	●	●		●	●		○	○	●	●	●					
		110	90	70	80	60		180	100		80	60	270	190	150					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Z	Feed fz		art.no.	€
					steel < 1000 N/mm² mm/tooth	steel < 1000 N/mm² mm/tooth		
3.0	12	50	6.0	4	0.012	0.015	251517 0030	23,60
4.0	15	50	6.0	4	0.012	0.015	251517 0040	23,60
5.0	20	60	6.0	4	0.024	0.030	251517 0050	23,60
6.0	20	60	6.0	4	0.024	0.030	251517 0060	23,60
8.0	25	70	8.0	4	0.024	0.030	251517 0080	30,20
10.0	30	90	10.0	4	0.032	0.040	251517 0100	44,40
12.0	30	90	12.0	4	0.032	0.040	251517 0120	61,60
16.0	50	110	16.0	4	0.040	0.050	251517 0160	115,-
20.0	55	110	20.0	4	0.048	0.060	251517 0200	190,50



Staggered prices in online shop

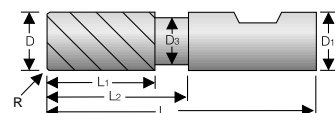
2148

## SARA® Steel end milling cutter

NEW

VHM **759**

- Unequal pitch for vibration-free milling
- With corner protection radius R for improved service life

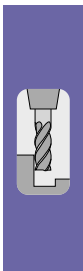


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc	
		200	160	150	80	120	80	170	110	60	30	30	330	300	280					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L2	L	D1	D3	R	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	steel < 1000 N/mm²	steel < 1000 N/mm²		
4	11	20	57	6	3.7	0.1	0.012	0.02	254111 0040	23,50
5	13	20	57	6	4.6	0.1	0.016	0.025	254111 0050	23,50
6	20	25	60	6	5.5	0.1	0.019	0.031	254111 0060	23,50
8	20	26	64	8	7.4	0.2	0.026	0.043	254111 0080	31,80
10	22	32	72	10	9.2	0.2	0.034	0.056	254111 0100	43,10
12	26	37	83	12	11	0.2	0.041	0.070	254111 0120	58,80
14	26	37	83	14	13	0.2	0.047	0.079	254111 0140	83,40
16	32	42	92	16	15	0.2	0.053	0.087	254111 0160	99,70
18	32	42	92	18	17	0.2	0.058	0.092	254111 0180	135,50
20	38	50	104	20	19	0.2	0.064	0.098	254111 0200	159,50

Steel professional

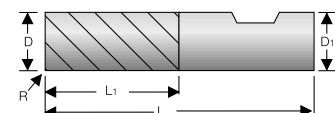


2179

## VAN HOORN CARBIDE VHRS end milling cutter

VHM **756**

- Cutting material, solid carbide ultra-fine grain TiAlN-coated
- Special pre-treatment and finishing treatment due to micro radiation
- Version with 4 or 5 cutting edges
- For wet and dry machining, extremely high chip removal rates and service life



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc	
		140-220	100-180	70-160	80-130	60-100		100-160	90-140											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Standard, 4 cutting edges

D	R	D1	L	L1	Z	Feed fz	Feed fz	DIN 6535-HB	€
mm	mm	mm	mm	mm		steel < 1000 N/mm²	steel < 1000 N/mm²	art.no.	
3	0.2	6	51	7	4	0.01	0.015	255100 0302	40,-
4	0.2	6	51	9	4	0.012	0.02	255100 0402	43,90
5	0.2	6	51	11	4	0.02	0.03	255100 0502	47,40
6	0.1	6	64	13	4	0.025	0.035	255100 0601	51,40
6	0.3	6	64	13	4	0.025	0.035	255100 0603	51,40
6	0.5	6	64	13	4	0.025	0.035	255100 0605	51,40
6	1	6	64	13	4	0.025	0.035	255100 0610	51,40
8	0.1	8	64	18	4	0.035	0.045	255100 0801	67,70
8	0.3	8	64	18	4	0.035	0.045	255100 0803	67,70
8	0.5	8	64	18	4	0.035	0.045	255100 0805	67,70
8	1	8	64	18	4	0.035	0.045	255100 0810	67,70
10	0.1	10	70	22	4	0.04	0.055	255100 1001	88,50



The specialist in steel

2113

Continued on next page >>>

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth		DIN 6535-HB art.no. €	
10	0.3	10	70	22	4	0.04	0.055	255100 1003	88,50
10	0.5	10	70	22	4	0.04	0.055	255100 1005	88,50
10	1	10	70	22	4	0.04	0.055	255100 1010	88,50
12	0.1	12	78	25	4	0.05	0.065	255100 1201	124,50
12	0.3	12	78	25	4	0.05	0.065	255100 1203	124,50
12	0.5	12	78	25	4	0.05	0.065	255100 1205	124,50
12	1	12	78	25	4	0.05	0.065	255100 1210	124,50
14	0.5	14	89	30	4	0.055	0.08	255100 1405	184,50
14	1	14	89	30	4	0.055	0.08	255100 1410	184,50
16	0.1	16	89	35	4	0.06	0.08	255100 1601	181,50
16	0.5	16	89	35	4	0.06	0.08	255100 1605	181,50
16	1	16	89	35	4	0.06	0.08	255100 1610	181,50
20	0.5	20	102	42	4	0.08	0.1	255100 2005	290,-
20	1	20	102	42	4	0.08	0.1	255100 2010	290,-
25	0.5	25	120	45	4	0.11	0.12	255100 2505	405,-
25	1	25	120	45	4	0.11	0.12	255100 2510	405,-

2113

## Standard, 5 cutting edges

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth		DIN 6535-HB art.no. €	
3	0.2	6	51	7	5	0.015		255101 0302	40,-
4	0.2	6	51	9	5	0.02		255101 0402	43,90
5	0.2	6	51	11	5	0.03		255101 0502	47,40
6	0.1	6	64	13	5	0.035		255101 0601	51,40
6	0.3	6	64	13	5	0.035		255101 0603	51,40
6	0.5	6	64	13	5	0.035		255101 0605	51,40
6	1	6	64	13	5	0.035		255101 0610	51,40
8	0.1	8	64	18	5	0.045		255101 0801	67,70
8	0.3	8	64	18	5	0.045		255101 0803	67,70
8	0.5	8	64	18	5	0.045		255101 0805	67,70
8	1	8	64	18	5	0.045		255101 0810	67,70
10	0.1	10	70	22	5	0.055		255101 1001	88,50
10	0.3	10	70	22	5	0.055		255101 1003	88,50
10	0.5	10	70	22	5	0.055		255101 1005	88,50
10	1	10	70	22	5	0.055		255101 1010	88,50
12	0.1	12	78	25	5	0.065		255101 1201	124,50
12	0.3	12	78	25	5	0.065		255101 1203	124,50
12	0.5	12	78	25	5	0.065		255101 1205	124,50
12	1	12	78	25	5	0.065		255101 1210	124,50
14	0.5	14	89	30	5	0.08		255101 1405	184,50
14	1	14	89	30	5	0.08		255101 1410	184,50
16	0.1	16	89	35	5	0.08		255101 1601	181,50
16	0.5	16	92	35	5	0.08		255101 1605	181,50
16	1	16	92	35	5	0.08		255101 1610	181,50
20	0.5	20	102	42	5	0.1		255101 2005	290,-
20	1	20	102	42	5	0.1		255101 2010	290,-
25	0.5	25	120	45	5	0.12		255101 2505	405,-
25	1	25	120	45	5	0.12		255101 2510	405,-

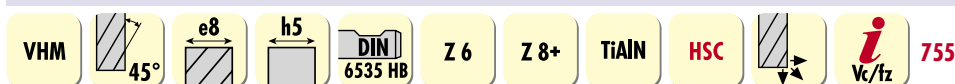
2113



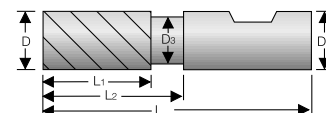
for trochoid milling

Other tools with  
clearance in the van Horn  
manufacturer catalogue

## SARA® End milling cutters



- With clearance
- First-rate chip removal due to extremely smooth surface
- Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	≥ 60 HRC	≥ 60 HRC
		140-160	120-140	100-140	70-90	80-100		180-200	170-190								40-50		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Standard version

- Shank with driving planes in accordance with DIN 6535 HB

D	L1	L2	L	D1	D3	Z	Feed fz	Feed fz	DIN 6535-HB	€
mm	mm	mm	mm	mm	mm		steel < 1400 N/mm <sup>2</sup>	steel < 1400 N/mm <sup>2</sup>	art.no.	
4.0	11	19	57	6.0	3.7	6	0.015	0.020	254058 0040	38,20
5.0	13	19	57	6.0	4.7	6	0.150	0.020	254058 0050	35,30
6.0	13	19	57	6.0	5.7	6	0.020	0.030	254058 0060	34,70
8.0	19	25	63	8.0	7.7	6	0.020	0.030	254058 0080	40,50
10.0	22	30	72	10.0	9.7	6	0.030	0.040	254058 0100	64,10
12.0	26	36	83	12.0	11.5	6	0.050	0.060	254058 0120	84,50
14.0	26	36	83	14.0	13.5	6	0.050	0.060	254058 0140	121,50
16.0	32	42	92	16.0	15.5	6	0.070	0.080	254058 0160	151,-
18.0	32	42	92	18.0	17.5	8	0.090	0.100	254058 0180	187,50
20.0	38	52	104	20.0	19.5	8	0.100	0.120	254058 0200	214,-

2145

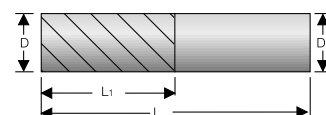


## SARA® End milling cutters



- Extra-long version
- Cutting material: ultra-fine grain solid carbide, TiAlN-coated

**Up to 55 HRC**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	≥ 60 HRC	≥ 60 HRC
		140-160	120-140	100-140	70-90	80-100		180-200	170-190								40-50	30-40	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L	D1	Feed fz	art.no.	€
mm	mm	mm	mm	steel < 1000 N/mm <sup>2</sup>		
6.0	26	70	6.0	0.030	254109 0060	56,50
8.0	36	90	8.0	0.040	254109 0080	73,80
10.0	46	100	10.0	0.060	254109 0100	116,-
12.0	56	110	12.0	0.060	254109 0120	165,-
16.0	66	130	16.0	0.080	254109 0160	285,-
20.0	76	140	20.0	0.100	254109 0200	445,-
25.0	92	180	25.0	0.150	254109 0250	849,-

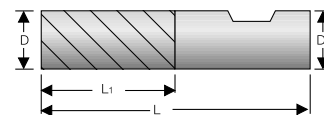
2109



## SARA® Basic-Line roughing cutter



- 3/4 cutting edges, long, 20° right-hand cutting
- Eccentric relief grinding
- Cutting material: fine grain solid carbide



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●							○			
		140	90	70				140	130							70			

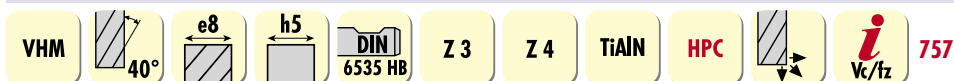
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
6.0	16	57	6.0	3	0.024	0.030	254018 0060	25,80
8.0	16	63	8.0	3	0.024	0.030	254018 0080	29,-
10.0	22	72	10.0	4	0.032	0.040	254018 0100	43,20
12.0	26	83	12.0	4	0.032	0.040	254018 0120	54,-
16.0	32	92	16.0	4	0.040	0.050	254018 0160	88,50
20.0	38	104	20.0	4	0.048	0.060	254018 0200	137,50



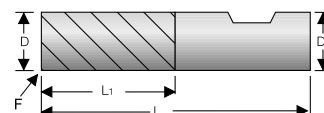
2148

## VAN HOORN CARBIDE VHRFFW roughing cutter



- Cutting material: ultra-fine grain solid carbide, TiAlN-coated
- Special microwave pre-treatment and finishing treatment
- New chip flute geometry for enhanced cooling and chip flow
- For wet and dry machining, extremely high chip removal rates and long service life

**Feed rate up to 3 m/min.**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo.	hardened steel		
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●										
		250-300	150-200	110-150				110-170	100-150										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



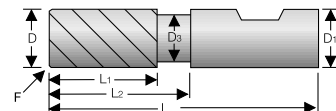
D mm	F mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
6.0	0.25	16	64	6.0	3	0.035	0.050	254015 0060	55,50
8.0	0.50	20	64	8.0	3	0.045	0.060	254015 0080	72,80
10.0	0.50	22	70	10.0	3	0.050	0.070	254015 0100	99,70
12.0	0.50	25	78	12.0	3	0.060	0.080	254015 0120	128,50
14.0	1.00	25	89	14.0	3	0.070	0.090	254015 0140	143,50
16.0	1.00	35	89	16.0	3	0.080	0.10	254015 0160	184,50
20.0	1.00	40	102	20.0	4	0.10	0.12	254015 0200	250,-

2113

## SARA® Roughing cutter



- With clearance
- First-rate chip removal due to extremely smooth surface
- Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●										
		90-160	80-110	60-80				130-160	130-150										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L2	L	D1	D3	F x 45°	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	steel < 1400 N/mm <sup>2</sup>	steel < 1400 N/mm <sup>2</sup>		
5.0	13	19	57	6.0	4.8	0.5	0.024	0.030	254090 0050	95,60
6.0	13	19	57	6.0	5.8	0.5	0.024	0.030	254090 0060	95,60
8.0	19	25	63	8.0	7.7	0.5	0.024	0.030	254090 0080	109,-
10.0	22	30	72	10.0	9.8	0.5	0.032	0.040	254090 0100	120,50
12.0	26	36	83	12.0	11.8	0.5	0.032	0.040	254090 0120	143,50
14.0	26	36	83	14.0	13.8	0.5	0.040	0.050	254090 0140	198,50
16.0	32	42	92	16.0	15.7	0.5	0.040	0.050	254090 0160	224,-
18.0	32	42	92	18.0	17.7	0.5	0.048	0.060	254090 0180	301,-
20.0	38	52	104	20.0	19.7	0.5	0.048	0.060	254090 0200	336,-



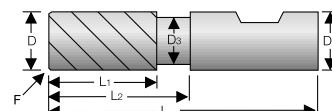
2145

## ATORN® Roughing / finishing cutter

NEW



- Unequal pitch for low-vibration milling
- two roughing cutters Type NF and two smoothing cutters Type N
- smooth surface



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●	○	●	●	○	○	○							
		160	150	140	90	95	45	160	115	100	45	40							

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L2	L	D1	D3	F x 45°	Z	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm		steel < 1000 N/mm <sup>2</sup>	steel < 1000 N/mm <sup>2</sup>		
6	14	20	62	6	5.5	0.2	4	0.052	0.057	254030 0060	77,90
8	18	26	68	8	7.4	0.2	4	0.073	0.081	254030 0080	95,10
10	22	32	80	10	9.2	0.2	4	0.094	0.107	254030 0100	121,50
12	26	38	83	12	11	0.2	4	0.117	0.136	254030 0120	144,50
16	34	44	92	16	15	0.3	4	0.168	0.202	254030 0160	229,-
20	42	60	110	20	19	0.3	4	0.224	0.277	254030 0200	341,-



2153

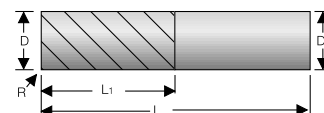


## SARA® Torus milling cutter



- Long version
- Cutting material: ultra-fine grain solid carbide, TiAlN-coated

**Up to 60 HRC**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRC	≥ 30 HRC	<8 % Si	≥ 8 % Si			<55 HRC	<60 HRC	≥ 60 HRC
		70-85	60-70	50-70	40-50	40-50		55-85	50-60								20-30	15-20	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	R mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	0.3	12	50	6.0	0.152	254017 0001	40,70
4.0	0.3	15	50	6.0	0.151	254017 0002	40,70
4.0	0.5	15	50	6.0	0.151	254017 0003	40,70
5.0	0.3	20	60	6.0	0.149	254017 0004	40,70
5.0	0.5	20	60	6.0	0.149	254017 0005	40,70
6.0	0.3	20	60	6.0	0.149	254017 0006	40,70
6.0	0.5	20	60	6.0	0.149	254017 0060	40,70
6.0	1.0	20	60	6.0	0.149	254017 1060	40,70
8.0	0.3	25	70	8.0	0.149	254017 0010	49,20
8.0	0.5	25	70	8.0	0.149	254017 0080	49,20
8.0	1.0	25	70	8.0	0.149	254017 1080	49,20
8.0	1.5	25	70	8.0	0.149	254017 1580	49,20
8.0	2.0	25	70	8.0	0.149	254017 2080	49,20
10.0	0.3	30	90	10.0	0.157	254017 0015	70,70
10.0	0.5	30	90	10.0	0.157	254017 0100	70,70
10.0	1.0	30	90	10.0	0.157	254017 1100	70,70
10.0	1.5	30	90	10.0	0.157	254017 1105	70,70
10.0	2.0	30	90	10.0	0.157	254017 2100	70,70
12.0	0.5	30	90	12.0	0.157	254017 0120	104,-
12.0	1.0	30	90	12.0	0.157	254017 1120	104,-
12.0	1.5	30	90	12.0	0.157	254017 1125	104,-
12.0	2.0	30	90	12.0	0.157	254017 2120	104,-
16.0	0.5	50	110	16.0	0.161	254017 0024	183,50
16.0	1.0	50	110	16.0	0.161	254017 0025	183,50
16.0	1.5	50	110	16.0	0.161	254017 0026	183,50
16.0	2.0	50	110	16.0	0.161	254017 0027	183,50
20.0	0.5	50	110	20.0	0.167	254017 0028	318,-
20.0	1.0	50	110	20.0	0.167	254017 0029	318,-
20.0	1.5	50	110	20.0	0.167	254017 0030	318,-
20.0	2.0	50	110	20.0	0.167	254017 0031	318,-

2109



### SOLID CARBIDE MILLING CUTTERS

# AT THEIR BEST



**VAN HOORN**  
End milling cutters  
189 pages  
Art.no. 019900 0079

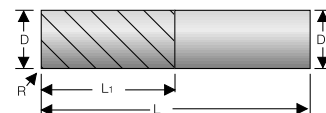
Overview of all free manufacturers' catalogues on page 16/17

## SARA® Torus milling cutter



- Long version
- Cutting material: ultra-fine grain solid carbide, TiAlN-coated

**Up to 60 HRC**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		● 70-85	● 60-70	● 50-70	○ 40-50	○ 40-50		● 55-85	● 50-60								● 20-30	● 15-20	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	R mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
3.0	0.3	12	50	6.0	0.041	<b>254019 0001</b>	<b>40,70</b>
4.0	0.3	15	50	6.0	0.041	254019 0002	<b>40,70</b>
4.0	0.5	15	50	6.0	0.041	254019 0003	<b>40,70</b>
5.0	0.3	20	60	6.0	0.041	254019 0004	<b>40,70</b>
5.0	0.5	20	60	6.0	0.041	254019 0005	<b>40,70</b>
6.0	0.3	20	60	6.0	0.041	254019 0006	<b>40,70</b>
6.0	0.5	20	60	6.0	0.041	254019 0060	<b>40,70</b>
6.0	1.0	20	60	6.0	0.041	254019 1060	<b>40,70</b>
8.0	0.3	25	70	8.0	0.041	254019 0010	<b>49,20</b>
8.0	0.5	25	70	8.0	0.041	254019 0080	<b>49,20</b>
8.0	1.0	25	70	8.0	0.041	254019 1080	<b>49,20</b>
8.0	1.5	25	70	8.0	0.041	254019 1580	<b>49,20</b>
8.0	2.0	25	70	8.0	0.041	254019 2080	<b>49,20</b>
10.0	0.3	30	90	10.0	0.042	254019 0015	<b>70,70</b>
10.0	0.5	30	90	10.0	0.042	254019 0100	<b>70,70</b>
10.0	1.0	30	90	10.0	0.042	254019 1100	<b>70,70</b>
10.0	1.5	30	90	10.0	0.042	254019 1105	<b>70,70</b>
10.0	2.0	30	90	10.0	0.042	254019 2100	<b>70,70</b>
12.0	0.5	30	90	12.0	0.042	254019 0120	<b>104,-</b>
12.0	1.0	30	90	12.0	0.042	254019 1120	<b>104,-</b>
12.0	1.5	30	90	12.0	0.042	254019 1125	<b>104,-</b>
12.0	2.0	30	90	12.0	0.042	254019 2120	<b>104,-</b>
16.0	0.5	50	110	16.0	0.043	254019 0024	<b>183,50</b>
16.0	1.0	50	110	16.0	0.043	254019 1160	<b>183,50</b>
16.0	1.5	50	110	16.0	0.043	254019 1165	<b>183,50</b>
16.0	2.0	50	110	16.0	0.043	254019 2160	<b>183,50</b>
20.0	0.5	50	110	20.0	0.044	254019 0028	<b>318,-</b>
20.0	1.0	50	110	20.0	0.044	254019 1200	<b>318,-</b>
20.0	1.5	50	110	20.0	0.044	254019 1205	<b>318,-</b>
20.0	2.0	50	110	20.0	0.044	254019 2200	<b>318,-</b>



2109

# Hydraulic expansion chucks



- Reduced-vibration tool clamping
- Increased tool endurance
- Reduced micro-nicks on the tool cutting edge
- High torque transfer
- High level of positioning accuracy and precision

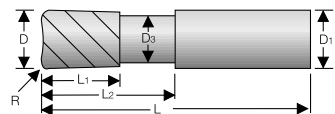
# Torus milling cutter WXS-CRE HPC-Turbomill

NEW

VHM Z 5 Z 4 TiAlN HPC HSC 794

**Twisted cutting edge, quiet operation up to 65 HRC, finishing geometry, feed rates up to 20,000 mm/min**

- 5 cutting edges, face cutter geometry for plunge milling
- Straight shank, suitable for use in shrink fit holders
- Thanks to a **newly developed cutting edge geometry**, this milling cutter is especially suitable for **extremely high feed rates** with normal-strength and **hardened materials**
- New, extremely ductile and fracture-proof ultra-fine grain quality with enhanced multi-layer coating (Ultra-WXS)
- **Cutting material: ultra-fine grain solid carbide, TiAlN-coated**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●									●	●			●	●	●



## Short (WXS-HS-CRE)

D mm	R mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	art.no.	€
6.0	1.5	6	5.4	50	2.5	24	5	294248 0615	108,80
8.0	2.0	8	7.2	60	3.5	32	5	294248 0820	131,40
10.0	2.0	10	9.0	70	4.0	40	5	294248 1020	168,60
12.0	3.0	12	11.0	80	5.0	48	5	294248 1230	200,10

2110



## long (WXS-CRE)

D mm	R mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	art.no.	€
2	0.5	6	2	50	0.8	8	4	294249 0020	87,40
3	0.75	6	2.7	55	1.2	12	5	294249 0030	98,40
4	1	6	3.6	55	1.6	12	5	294249 0040	102,40
6	1.5	6	5.4	90	2.5	12	5	294249 0060	122,80
8	2	8	7.2	100	3.5	16	5	294249 0080	148,20
10	2	10	9	100	4	20	5	294249 0100	190,30
12	3	12	11	110	5	24	5	294249 0120	225,70

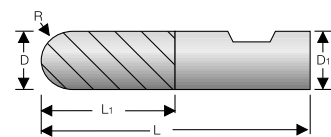
2110



# SARA® Basic-Line radius milling cutter

VHM Z 2 TiAlN 772

- 2 cutting edges, long, 30° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●				●	●	●				
		130	90	65				110	80				300	210	250				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	7	57	6.0	2	0.011	250515 0030	15,40
4.0	8	57	6.0	2	0.035	250515 0040	15,40
5.0	10	57	6.0	2	0.035	250515 0050	15,40
6.0	10	57	6.0	2	0.045	250515 0060	15,40
8.0	16	63	8.0	2	0.055	250515 0080	26,80
10.0	19	72	10.0	2	0.065	250515 0100	42,30
12.0	22	83	12.0	2	0.065	250515 0120	52,90
16.0	26	92	16.0	2	0.090	250515 0160	85,50
20.0	32	104	20.0	2	0.120	250515 0200	128,50

2148



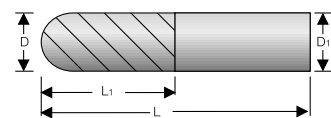
**Staggered prices in online shop**

# SARA® Radius milling cutter

VHM
 30°
 e8
 h5
 DIN 6535 HA
Z 2
TiAlN
HSC
 Vc/fz
772

- Long and extra-long versions
- Cutting material: ultra-fine grain solid carbide, TiAlN-coated

**Up to 60 HRC**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si			< 55 HRC	< 60 HRC	≥ 60 HRC
254011....	●	150-170	120-150	100-140	●	●		●	●								●	●	
254112....	●	120-150	100-130	90-130	●	●											●	●	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Long

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
1.0	2.5	50	4.0	0.082	<b>254011 0010</b>	<b>34,70</b>
1.5	4	50	4.0	0.082	254011 0015	34,70
2.0	5	50	6.0	0.082	254011 0020	32,10
3.0	8	60	6.0	0.081	254011 0030	32,10
4.0	8	70	6.0	0.081	254011 0040	34,70
5.0	10	80	6.0	0.078	254011 0050	36,20
6.0	12	90	6.0	0.078	254011 0060	38,-
7.0	14	90	8.0	0.078	254011 0070	59,50
8.0	14	100	8.0	0.066	254011 0080	59,50
10.0	18	100	10.0	0.066	254011 0100	95,10
12.0	22	110	12.0	0.074	254011 0120	122,-
16.0	30	140	16.0	0.081	254011 0160	207,-
20.0	38	160	20.0	0.089	254011 0200	326,-

2109



## Extra-long

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
2.0	6	80	3.0	0.082	<b>254112 0020</b>	<b>46,50</b>
3.0	8	100	3.0	0.081	254112 0030	46,50
4.0	8	100	4.0	0.081	254112 0040	46,50
5.0	10	120	6.0	0.078	254112 0050	46,50
6.0	10	120	6.0	0.078	254112 0060	46,50
8.0	14	140	8.0	0.066	254112 0080	82,90
10.0	18	180	10.0	0.066	254112 0100	155,-
12.0	22	200	12.0	0.074	254112 0120	202,-
16.0	30	250	16.0	0.081	254112 0160	344,-
20.0	38	250	20.0	0.089	254112 0200	539,-

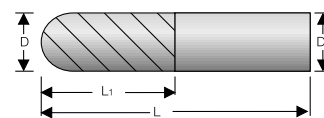
2109



## SARA® Radius milling cutter



- Short version
- Eccentric relief grinding



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		100-120	80-100	40-80	60-90	60-90		90-120	60-120			200-400	100-200	100-300				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	TiAlN gecoat art.no.	€
3.0	10	40	3.0	0.009	251532 0030	29,90
4.0	15	50	4.0	0.030	251532 0040	30,80
5.0	15	50	5.0	0.030	251532 0050	31,90
6.0	20	65	6.0	0.041	251532 0060	33,50
8.0	20	65	8.0	0.050	251532 0080	47,-
10.0	22	70	10.0	0.058	251532 0100	68,70
12.0	25	78	12.0	0.680	251532 0120	87,50
14.0	30	89	14.0	0.095	251532 0140	103,-
16.0	32	89	16.0	0.095	251532 0160	136,50
20.0	38	102	20.0	0.115	251532 0200	219,-

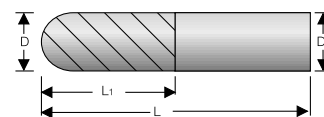
2109



## SARA® Radius milling cutter



- Long version
- Cutting material: ultra-fine grain solid carbide, TiAlN-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		150-170	120-150	100-140	60-100	60-100		180-220	160-200							60-80		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
1.0	2.5	50	4.0	0.020	254013 0010	48,50
1.5	4	50	4.0	0.025	254013 0015	48,50
2.0	5	50	6.0	0.025	254013 0020	44,90
3.0	8	60	6.0	0.025	254013 0030	44,90
5.0	10	80	6.0	0.030	254013 0050	44,10
6.0	12	90	6.0	0.040	254013 0060	46,80
7.0	14	90	8.0	0.050	254013 0070	68,70
8.0	14	100	8.0	0.058	254013 0080	68,70
10.0	18	100	10.0	0.068	254013 0100	103,-
12.0	22	110	12.0	0.095	254013 0120	135,50
16.0	30	140	16.0	0.095	254013 0160	222,-
20.0	38	160	20.0	0.115	254013 0200	375,-

2109

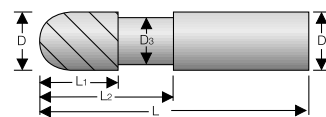


**SARA® Radius milling cutter 220°**

**NEW**

VHM **775**

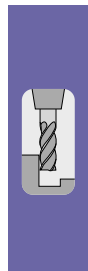
- with clearance
- Enclosing angle 220°
- Cutting material: ultra micro-grain SC, TiAlN-Ultra-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●								○	○	○
		350	250	170				450	410								120	90	70

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.









D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
1.00	6.00	0.90	80	0.72	5	0.5	0.007	<b>250510 0010</b>	<b>92,60</b>
2.0	6.0	1.80	80	1.44	10	1.0	0.011	250510 0020	92,60
3.0	6.0	2.80	80	2.04	15	1.5	0.011	250510 0030	92,60
4.0	6.0	3.80	80	2.62	20	2.0	0.035	250510 0040	92,60
5.0	6.0	4.70	90	3.35	25	2.5	0.035	250510 0050	92,60
6.0	6.0	5.70	70	3.94	30	3.0	0.045	250510 0060	92,60
6.0	6.0	5.70	100	3.94	30	3.0	0.045	250510 1060	91,60
8.0	8.0	7.50	100	5.39	50	4.0	0.055	250510 0080	119,-
10.0	10.0	9.40	120	6.71	50	5.0	0.065	250510 0100	166,50
12.0	12.0	11.20	120	8.15	50	6.0	0.065	250510 0120	213,-
16.0	16.0	15.0	150	10.78	60	8.0	0.09	250510 0160	227,-



2109



## Overview of the 35 - 38 ° HPC series

Sorting by type and number of cutting edges	End milling cutters				Drilling and plunge milling cutters		End milling cutters	
								
Brand	SARA®	SARA®	SARA®	SARA®	SARA®	SARA®	SARA®	SARA®
ISO	P M K	P M K	P M K	P M K	P M K S	P M K S	P M K	P M K S
Number of cutting edges	4	4	4	4	4	4	4	4
Diameter range / mm	3.0 - 25.0	3.0 - 25.0	5.0 - 20.0	3.0 - 25.0	5.7 - 20.0	5.7 - 20.0	6.0 - 20.0	3.0 - 25.0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Short	Long	Extra-long	Long	HA shank	HB shank	Long	Short
Type/profile	N / H	N / H	N / H	N / H			N / H	N / H
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN	TiAlN	TiAlN	AlTiN	AlTiN	AlTiN	AlTiN
Order No.	254130....	254131....	254132....	254133....	254144....	254145....	254140....	254134....
Catalogue page	485	485	486	486	487	487	488	488

Sorting by type and number of cutting edges	End milling cutters		Roughing cutter			Torus milling cutters	Radius milling cutters
							
Brand	SARA®	SARA®	SARA®	SARA®	SARA®	SARA®	SARA®
ISO	P M K S	P M K S	P M K	P M K	P M K	P M K	P K
Number of cutting edges	4	4	4	4	4	4	4
Diameter range / mm	3.0 - 25.0	3.0 - 25.0	4.0 - 20.0	4.0 - 20.0	6.0 - 20.0	4.0 - 20.0	3.0 - 20.0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Long	Long	Short	Standard	Long		
Type/profile	N / H	N / H	NF	NF	NF	NH	
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlTiN	AlTiN	AlTiN	AlTiN	AlTiN	TiAlN	TiAlN
Order No.	254135....	254136....	254141....	254137....	254142....	254139....	254138....
Catalogue page	489	489	490	490	490	491	491

### SARA® The 35 - 38 ° HPC series

**With irregular helix angle and an extremely high material removal rate**

- Minimisation of vibration
- Better surface finish
- Protective chamfer F for increased service life
- Optional shank for greater cutting depths
- High-performance layer for high hot hardness and oxidation resistance
- Ideally suited for high performance cutting
- Short and long designs for machining steel, cast iron, stainless steel and titanium alloys

**The universal tool for all roughing and finishing work**

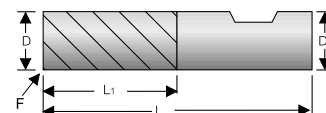


**INFO**

# SARA® End milling cutters



- Irregular helix angle and pitch for low-vibration milling
- With protective chamfer F for improved service life
- Also suitable for dry machining



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CF/thermo.	hardened steel			
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
254130....	●	●	●	●	○	○		○	○											
254131....	●	●	●	●	○	○		○	○											
254132....	●	●	●	●	○	○		○	○											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	6	54	6	0.10	0.008	0.009	<b>254130 0030</b>	28,-
4.0	8	54	6	0.13	0.013	0.015	254130 0040	28,-
5.0	9	54	6	0.18	0.021	0.025	254130 0050	28,-
6.0	10	54	6	0.20	0.021	0.025	254130 0060	28,-
7.0	12	58	8	0.20	0.027	0.032	254130 0070	36,50
8.0	12	58	8	0.20	0.027	0.032	254130 0080	36,50
9.0	14	66	10	0.30	0.027	0.032	254130 0090	51,10
10.0	14	66	10	0.30	0.044	0.052	254130 0100	51,10
11.0	16	73	12	0.30	0.044	0.052	254130 0110	65,70
12.0	16	73	12	0.30	0.044	0.052	254130 0120	65,70
13.0	18	75	14	0.30	0.044	0.052	254130 0130	81,70
14.0	18	75	14	0.30	0.059	0.07	254130 0140	81,70
16.0	22	82	16	0.40	0.059	0.07	254130 0160	106,-
18.0	24	84	18	0.40	0.071	0.084	254130 0180	156,-
20.0	26	92	20	0.50	0.071	0.084	254130 0200	163,50
25.0	32	92	25	0.50	0.077	0.091	254130 0250	380,-

2156



## Long

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	57	6	0.10	0.008	0.009	<b>254131 0030</b>	31,70
4.0	11	57	6	0.13	0.013	0.015	254131 0040	31,70
5.0	13	57	6	0.18	0.021	0.025	254131 0050	31,70
6.0	13	57	6	0.20	0.021	0.025	254131 0060	31,70
7.0	19	63	8	0.20	0.027	0.032	254131 0070	42,70
8.0	19	63	8	0.20	0.027	0.032	254131 0080	42,70
9.0	22	72	10	0.30	0.027	0.032	254131 0090	61,70
10.0	22	72	10	0.30	0.044	0.052	254131 0100	61,70
11.0	26	83	12	0.30	0.044	0.052	254131 0110	78,20
12.0	26	83	12	0.30	0.044	0.052	254131 0120	78,20
13.0	26	83	14	0.30	0.059	0.07	254131 0130	105,-
14.0	26	83	14	0.30	0.059	0.07	254131 0140	105,-
16.0	32	92	16	0.40	0.059	0.07	254131 0160	136,50
18.0	32	92	18	0.40	0.071	0.084	254131 0180	189,-
20.0	38	104	20	0.50	0.071	0.084	254131 0200	207,-
25.0	38	104	25	0.50	0.077	0.091	254131 0250	430,-

2156



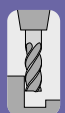
Continued on next page >>>

Extra-long

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
5.0	21	63	6	0.18	0.021	0.025	254132 0050	48,80
6.0	22	63	6	0.20	0.021	0.025	254132 0060	48,80
8.0	28	80	8	0.20	0.027	0.032	254132 0080	60,90
10.0	33	100	10	0.30	0.044	0.052	254132 0100	78,20
12.0	42	100	12	0.30	0.044	0.052	254132 0120	101,50
14.0	48	100	14	0.30	0.059	0.07	254132 0140	124,50
16.0	53	150	16	0.40	0.059	0.07	254132 0160	185,50
20.0	68	150	20	0.50	0.071	0.084	254132 0200	267,-



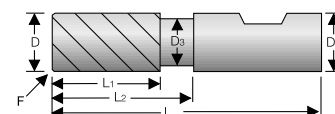
2156



SARA® End milling cutters

VHM NH 35°/38° h10 h6 DIN 6535 HB Z 4 TiAlN HPC i Vc/fz 761

- With clearance
- Irregular helix angle and pitch for low-vibration milling
- With protective chamfer F for improved service life
- Also suitable for dry machining



material	● very well suited	steel			stainless steel		cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium	copper	graphite	hardened steel				
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		115-135	100-120	60-80	50-75	50-75	100-140	100-140										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
3.0	8	18	57	2.8	6	0.13	0.008	0.009	254133 0030	35,30
4.0	11	21	57	3.6	6	0.18	0.013	0.015	254133 0040	35,30
5.0	13	21	57	4.6	6	0.20	0.021	0.025	254133 0050	35,30
6.0	13	21	57	5.5	6	0.20	0.021	0.025	254133 0060	35,30
7.0	19	27	63	6.5	8	0.20	0.027	0.032	254133 0070	47,50
8.0	19	27	63	7.5	8	0.20	0.027	0.032	254133 0080	47,50
9.0	22	32	72	8.5	10	0.30	0.027	0.032	254133 0090	67,40
10.0	22	32	72	9.5	10	0.30	0.044	0.052	254133 0100	67,40
11.0	26	38	83	10.5	12	0.30	0.044	0.052	254133 0110	82,70
12.0	26	38	83	11.5	12	0.30	0.044	0.052	254133 0120	82,70
13.0	26	42	83	12.5	14	0.30	0.059	0.07	254133 0130	108,50
14.0	26	42	83	13.5	14	0.30	0.059	0.07	254133 0140	108,50
16.0	32	44	92	15.5	16	0.40	0.059	0.07	254133 0160	141,50
18.0	32	50	100	17.5	18	0.40	0.071	0.084	254133 0180	194,-
20.0	38	54	104	19.5	20	0.50	0.071	0.084	254133 0200	214,-
25.0	42	65	121	24.0	25	0.50	0.077	0.091	254133 0250	435,-



2156

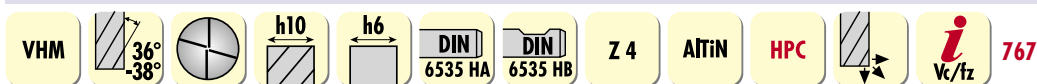
End milling cutter set, 5 pcs

Contents	art.no.	€
Set, solid carbide 35°/38° Ø 6/8/10/12/16 mm, 4 cutting edges, TiAlN	254133 1005	375,-

2156

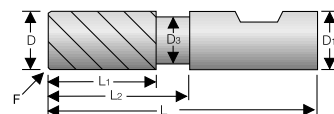


# SARA® Drilling and plunge milling cutter



- Face geometry for drilling and ramping
- With clearance
- Irregular pitch to minimise vibrations
- High material removal rate
- High feed rates for plunge milling and groove milling
- Up to 45° plunge angle
- Undersized for precise fitting grooves

**Drilling and milling with one tool**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		210	175	120	110	110	90	150	110		60-70	20-35	15-30							

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



## Standard

D	L1	L2	D1	L	D3	F x 45°	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	DIN 6535-HA art.no.	€
5.7	13	19	6	57	5.4	0.1	0.03	0.04	254144 0057	36,80
6	13	19	6	57	5.7	0.1	0.03	0.04	254144 0060	36,80
7.7	19	25	8	63	7.3	0.2	0.045	0.055	254144 0077	49,70
8	19	25	8	63	7.6	0.2	0.045	0.055	254144 0080	49,70
10	22	30	10	72	9.5	0.25	0.055	0.065	254144 0100	74,30
12	26	36	12	83	11.5	0.3	0.06	0.08	254144 0120	95,10
14	26	36	14	83	13.5	0.35	0.07	0.09	254144 0140	125,50
16	32	42	16	92	15.5	0.4	0.085	0.1	254144 0160	164,-
20	38	52	20	104	19.5	0.5	0.1	0.12	254144 0200	250,-



2156

## Standard with driving plane

D	L1	L2	D1	L	D3	F x 45°	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	DIN 6535-HB art.no.	€
5.7	13	19	6	57	5.4	0.1	0.03	0.04	254145 0057	36,80
6	13	19	6	57	5.7	0.1	0.03	0.04	254145 0060	36,80
7.7	19	25	8	63	7.3	0.2	0.045	0.055	254145 0077	49,70
8	19	25	8	63	7.6	0.2	0.045	0.055	254145 0080	49,70
10	22	30	10	72	9.5	0.25	0.055	0.065	254145 0100	74,30
12	26	36	12	83	11.5	0.3	0.06	0.08	254145 0120	95,10
14	26	36	14	83	13.5	0.35	0.07	0.09	254145 0140	125,50
16	32	42	16	92	15.5	0.4	0.085	0.1	254145 0160	164,-
20	38	52	20	104	19.5	0.5	0.1	0.12	254145 0200	250,-

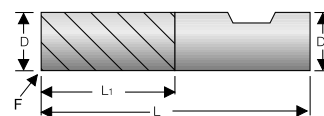


2156

## SARA® End milling cutters

VHM NH Z 4 HPC 761

- With internal coolant supply
- Irregular helix angle and pitch for low-vibration milling
- With protective chamfer F for improved service life



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	●	●	●	●	●											
		120-140	100-125	60-80	50-85	50-85	40-60	100-140	80-100											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L	D1	F x 45°	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	steel < 1000 N/mm <sup>2</sup> mm/tooth	steel < 1000 N/mm <sup>2</sup> mm/tooth		
6.0	13	57	6	0.20	0.021	0.025	254140 0060	77,90
8.0	19	63	8	0.20	0.027	0.032	254140 0080	84,-
10.0	22	72	10	0.30	0.044	0.052	254140 0100	91,50
12.0	26	83	12	0.30	0.044	0.052	254140 0120	112,-
16.0	32	92	16	0.40	0.059	0.07	254140 0160	170,50
20.0	38	104	20	0.50	0.071	0.084	254140 0200	250,-

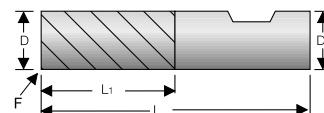
2156



## SARA® Stainless steel end milling cutter

VHM Typ N Z 4 HPC 764

- Irregular helix angle and pitch for low-vibration milling
- With protective chamfer F for improved service life
- Specially designed for stainless steel machining



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●		●	●	●	○	○	●	●	●								
		120-150	80-110		40-65	40-65	30-50	100-140	80-100	30-45	30-45	25-40								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Short

D	L1	L	D1	F x 45°	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	stainless steel austenitic mm/tooth	stainless steel austenitic mm/tooth		
3.0	6	54	6	0.10	0.008	0.009	254134 0030	28,-
4.0	8	54	6	0.13	0.013	0.015	254134 0040	28,-
5.0	9	54	6	0.18	0.021	0.025	254134 0050	28,-
6.0	10	54	6	0.20	0.021	0.025	254134 0060	28,-
7.0	12	58	8	0.20	0.027	0.032	254134 0070	36,60
8.0	12	58	8	0.20	0.027	0.032	254134 0080	36,60
9.0	14	66	10	0.30	0.027	0.032	254134 0090	51,10
10.0	14	66	10	0.30	0.044	0.052	254134 0100	51,10
11.0	16	73	12	0.30	0.044	0.052	254134 0110	65,70
12.0	16	73	12	0.30	0.044	0.052	254134 0120	65,70
13.0	18	75	14	0.30	0.059	0.07	254134 0130	81,70
14.0	18	75	14	0.30	0.059	0.07	254134 0140	81,70
16.0	22	82	16	0.40	0.059	0.07	254134 0160	106,-
18.0	24	84	18	0.40	0.071	0.084	254134 0180	156,-
20.0	26	92	20	0.50	0.071	0.084	254134 0200	163,-
25.0	32	92	25	0.50	0.077	0.091	254134 0250	380,-

2156

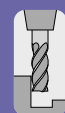


Long

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz		art.no.	€
					stainless steel	austenitic		
3.0	8	57	6	0.13	0.009	0.009	254135 0030	31,70
4.0	11	57	6	0.13	0.013	0.015	254135 0040	31,70
5.0	13	57	6	0.18	0.021	0.025	254135 0050	31,70
6.0	13	57	6	0.2	0.021	0.025	254135 0060	31,70
7.0	19	63	8	0.2	0.027	0.032	254135 0070	42,70
8.0	19	63	8	0.2	0.027	0.032	254135 0080	42,70
9.0	22	72	10	0.3	0.027	0.032	254135 0090	62,20
10.0	22	72	10	0.3	0.044	0.052	254135 0100	62,20
11.0	26	83	12	0.3	0.044	0.052	254135 0110	78,20
12.0	26	83	12	0.3	0.044	0.052	254135 0120	78,20
14.0	26	83	14	0.3	0.059	0.07	254135 0140	105,-
16.0	32	92	16	0.4	0.059	0.07	254135 0160	136,50
18.0	32	92	18	0.4	0.071	0.084	254135 0180	189,-
20.0	38	104	20	0.5	0.071	0.084	254135 0200	208,-
25.0	42	104	25	0.5	0.077	0.091	254135 0250	430,-



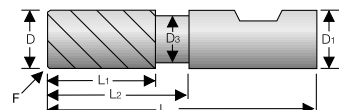
2156



**SARA® End milling cutters Stainless steel**

VHM Typ N 35°-38° h10 h6 DIN 6535 HB Z 4 AlTiN HPC Vc/fz 764

- With clearance
- Irregular helix angle and pitch for low-vibration milling
- With protective chamfer F for improved service life
- Specially designed for stainless steel machining



material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/Ni/Co-based		aluminium		copper	graphite	hardened steel			
			<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
			●	●		●	●	●	○	○	●	●	●								
			120-150	80-110		40-65	40-65	30-50	100-140	80-100	30-45	30-45	25-40								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Feed fz		art.no.	€
							stainless steel	austenitic		
3.0	8	18	57	2.8	6	0.13	0.008	0.009	254136 0030	35,30
4.0	11	21	57	3.6	6	0.18	0.013	0.015	254136 0040	35,30
5.0	13	21	57	4.6	6	0.20	0.021	0.025	254136 0050	35,30
6.0	13	21	57	5.5	6	0.20	0.021	0.025	254136 0060	35,30
7.0	19	27	63	6.5	8	0.20	0.027	0.032	254136 0070	47,50
8.0	19	27	63	7.5	8	0.20	0.027	0.032	254136 0080	47,50
9.0	22	32	72	8.5	10	0.30	0.027	0.032	254136 0090	67,10
10.0	22	32	72	9.5	10	0.30	0.044	0.052	254136 0100	67,10
11.0	26	38	83	10.5	12	0.30	0.044	0.052	254136 0110	82,70
12.0	26	38	83	11.5	12	0.30	0.044	0.052	254136 0120	82,70
13.0	26	42	83	12.5	14	0.30	0.059	0.07	254136 0130	108,50
14.0	26	42	83	13.5	14	0.30	0.059	0.07	254136 0140	108,50
16.0	32	44	92	15.5	16	0.40	0.059	0.07	254136 0160	141,50
18.0	32	50	100	17.5	18	0.40	0.071	0.084	254136 0180	192,50
20.0	38	54	104	19.5	20	0.50	0.071	0.084	254136 0200	213,-
25.0	42	65	121	24.0	25	0.50	0.077	0.091	254136 0250	430,-



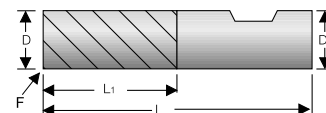
2156



# SARA® Roughing cutter



- Irregular helix angle for low-vibration milling
- With protective chamfer F for improved service life
- Also suitable for dry machining
- High material removal rate



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
		< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		130-150	80-100	40-70	50-60	50-60	30-50	100-120	50-70										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
4.0	6	54	6	0.13	0.013	0.015	<b>254141 0040</b>	28,70
5.0	8	54	6	0.15	0.021	0.025	254141 0050	28,70
6.0	10	54	6	0.20	0.021	0.025	254141 0060	28,70
8.0	12	58	8	0.20	0.027	0.032	254141 0080	40,20
10.0	14	66	10	0.30	0.044	0.052	254141 0100	57,20
12.0	16	73	12	0.30	0.044	0.052	254141 0120	71,20
14.0	18	75	14	0.30	0.059	0.07	254141 0140	98,70
16.0	22	82	16	0.40	0.059	0.07	254141 0160	125,50
20.0	26	92	20	0.50	0.071	0.084	254141 0200	267,-

2156



## Standard

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
4.0	11	57	6	0.13	0.044	0.015	<b>254137 0040</b>	34,10
5.0	13	57	6	0.18	0.044	0.025	254137 0050	34,10
6.0	13	57	6	0.20	0.059	0.025	254137 0060	34,10
8.0	19	63	8	0.20	0.059	0.032	254137 0080	46,20
10.0	22	72	10	0.30	0.071	0.052	254137 0100	68,20
12.0	26	83	12	0.30	0.021	0.052	254137 0120	85,30
14.0	26	83	14	0.30	0.027	0.070	254137 0140	112,-
16.0	32	92	16	0.40	0.044	0.070	254137 0160	148,50
20.0	38	104	20	0.50	0.044	0.084	254137 0200	311,-

2156



## Extra-long

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
6.0	24	68	6	0.3	0.021	0.025	<b>254142 0060</b>	53,50
8.0	38	88	8	0.3	0.027	0.032	254142 0080	73,10
10.0	45	95	10	0.4	0.044	0.052	254142 0100	99,80
12.0	53	110	12	0.5	0.044	0.052	254142 0120	133,-
16.0	63	123	16	0.6	0.059	0.07	254142 0160	225,-
20.0	75	141	20	0.6	0.071	0.084	254142 0200	380,-

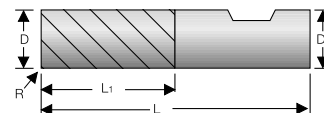
2156



## SARA® Torus milling cutter



- Irregular helix angle for low-vibration milling
- Also suitable for dry machining



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●		●		●	●								●	●	
		120-130	100-120	50-75	30-60	30-60		100-130	70-100								40-60	30-40	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D	L1	L	D1	R	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	steel < 1000 N/mm² mm/tooth	steel < 1000 N/mm² mm/tooth		
4.0	11	57	6	0.25	0.013	0.015	254139 0402	32,90
4.0	11	57	6	0.50	0.013	0.015	254139 0405	32,90
4.0	11	57	6	1.00	0.013	0.015	254139 0410	32,90
5.0	13	57	6	0.50	0.021	0.025	254139 0505	32,90
5.0	13	57	6	1.00	0.021	0.025	254139 0510	32,90
5.0	13	57	6	1.50	0.021	0.025	254139 0515	32,90
6.0	13	57	6	0.50	0.021	0.025	254139 0605	32,90
6.0	13	57	6	1.00	0.021	0.025	254139 0610	32,90
6.0	13	57	6	1.50	0.021	0.025	254139 0615	32,90
6.0	13	57	6	2.00	0.021	0.025	254139 0620	32,90
8.0	19	63	8	0.50	0.027	0.032	254139 0805	45,-
8.0	19	63	8	1.00	0.027	0.032	254139 0810	45,-
8.0	19	63	8	1.50	0.027	0.032	254139 0815	45,-
8.0	19	63	8	2.00	0.027	0.032	254139 0820	45,-
10.0	22	72	10	0.50	0.044	0.052	254139 1005	65,70
10.0	22	72	10	1.00	0.044	0.052	254139 1010	65,70
10.0	22	72	10	1.50	0.044	0.052	254139 1015	65,70
10.0	22	72	10	2.00	0.044	0.052	254139 1020	65,70
12.0	26	83	12	0.50	0.044	0.052	254139 1205	82,70

2156

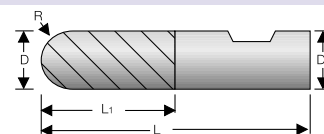
D	L1	L	D1	R	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	steel < 1000 N/mm² mm/tooth	steel < 1000 N/mm² mm/tooth		
12.0	26	83	12	1.00	0.044	0.052	254139 1210	82,70
12.0	26	83	12	1.50	0.044	0.052	254139 1215	82,70
12.0	26	83	12	2.00	0.044	0.052	254139 1220	82,70
14.0	26	83	14	1.00	0.059	0.07	254139 1410	111,-
14.0	26	83	14	2.00	0.059	0.07	254139 1420	111,-
16.0	32	92	16	1.00	0.059	0.07	254139 1610	144,50
16.0	32	92	16	1.50	0.059	0.07	254139 1615	144,50
16.0	32	92	16	2.00	0.059	0.07	254139 1620	144,50
16.0	32	92	16	2.50	0.059	0.07	254139 1625	144,50
18.0	32	92	18	1.50	0.071	0.084	254139 1815	199,50
18.0	32	92	18	2.50	0.071	0.084	254139 1825	199,50
20.0	38	104	20	1.00	0.071	0.084	254139 2010	220,-
20.0	38	104	20	1.50	0.071	0.084	254139 2015	220,-
20.0	38	104	20	2.00	0.071	0.084	254139 2020	220,-
20.0	38	104	20	2.50	0.071	0.084	254139 2025	220,-
20.0	38	104	20	3.00	0.071	0.084	254139 2030	220,-
20.0	38	104	20	4.00	0.071	0.084	254139 2040	220,-
20.0	38	104	20	5.00	0.071	0.084	254139 2050	220,-

2156

## SARA® Radius milling cutter



- Irregular helix angle for low-vibration milling
- Also suitable for dry machining



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●								●		
		450-550	250-350	200-250				450-550	400-500								100-140		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D	L1	L	D1	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	steel < 1000 N/mm² mm/tooth		
3.0	8	57	6	1.50	0.011	254138 0030	34,10
4.0	10	57	6	2.00	0.035	254138 0040	34,10
5.0	13	57	6	2.50	0.035	254138 0050	34,10
6.0	13	57	6	3.0	0.045	254138 0060	34,10
8.0	16	63	8	4.0	0.055	254138 0080	46,20

2156

D	L1	L	D1	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	steel < 1000 N/mm² mm/tooth		
10.0	22	72	10	5.0	0.065	254138 0100	68,20
12.0	26	83	12	6.0	0.065	254138 0120	85,30
14.0	26	83	14	7.0	0.09	254138 0140	113,-
16.0	32	92	16	8.0	0.09	254138 0160	148,50
20.0	38	104	20	10.0	0.12	254138 0200	226,-

2156

**Tough on everything!**

The performance of the low-vibration premium tools was significantly increased with the new ATORN HPC POWER high-performance range. It offers a milling range with innovative HPC geometry designed for efficient and universal machining of steel, stainless steel, non-ferrous metal, cast iron and special alloys.

Significantly higher material removal rates in machining are the result of various spiral angles in conjunction with newly developed, robust face and surface cutting edges. Even with extreme cutting data, the tools impress with their ultra-smooth operation, high process safety and low machine loads. Plunge milling and ramping processes are enhanced by the optimised face geometries. The new solid carbide with an innovative PVD high-performance coating also contributes to improved service life and safer chip removal.

**Advantages:**

- Increased productivity – roughing and finishing with the same tool
- Excellent surface quality even with high feed rates
- Long service life thanks to optimised cutting edge geometries and high-performance coatings
- Machining methods such as plunge milling/drilling or ramping possible
- Low machine load thanks to smooth operation, long service life
- Comprehensive possible uses and efficient machining of tough materials
- Suitable for all modern milling strategies e.g. trochoidal milling

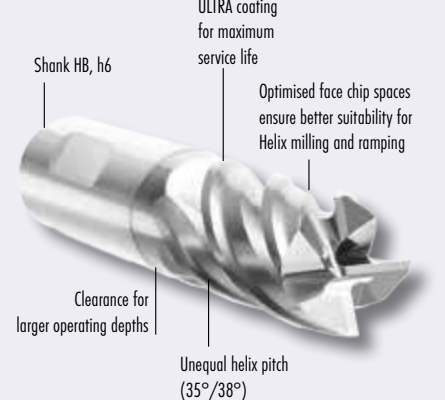
**UNIVERSAL**
**P M K N S**


Dual cutting edge protection with edge protection chamfer and robust face-cutter  
 Optimised face-cutter geometry with large chip spaces  
 Long design with axial internal cooling available

The HPC POWER groove milling cutter is a 3-edge high-performance tool. With its large chip spaces and excellent chip removal, it is ideal for groove milling. Each cutting edge has another helix angle (33°/35°/37°). In addition to the entire range of stainless and acid-resistant steels, it can also be used in all aspects of steel machining.

**Features:**

- Ø range 4 - 20 mm
- Long version
- Each cutting edge has another helix angle (33°/35°/37°)

**STEEL**
**P K**


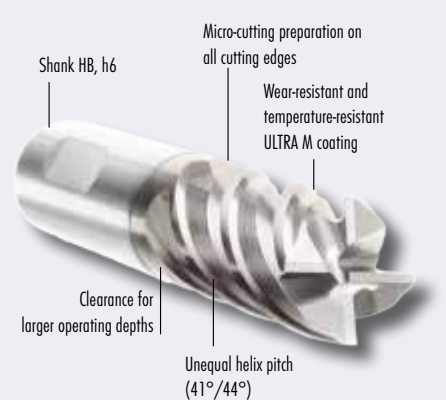
Dual cutting edge protection with edge protection chamfer and robust face-cutter  
 Defined cutting edge honing increases the service life and process safety  
 Radius-shaped gashing for improved chip removal

The performance of the low-vibration premium tools was considerably increased with the HPC POWER solid carbide end milling cutter for steel and cast iron: significantly higher material removal rates in machining are the result of various spiral angles in conjunction with newly developed, robust face and surface cutting edges.

A feature of the ATORN HPC POWER milling cutter is its multi-functional application: Roughing and finishing can be achieved with the same tool. Similarly, narrow bridges and grooves up to 2xD with outstanding surface quality can be produced.

**Features:**

- Ø range 4 - 20 mm
- Long version
- Unequal helix pitch (35°/38°)
- Low power consumption
- Stable cutting edge and edge protection chamfer
- Optimised face-cutter design

**Stainless steel**
**M N S**


New edge protection in the form multi-chamfer grinding  
 Optimised gashing in the centre  
 Long version with radial internal cooling available

The 4-edge high-speed milling cutter was specially developed for cutting stainless and acid-resistant steels, titanium and nickel-based alloys, as well as short-chipping aluminium.

Special cutting geometries combined with the optimum carbide quality and multi-layer, fine-crystal PVD coating set new standards in machining demanding materials. Chip formation, chip removal and temperature resistance were optimised and guarantee high-performance with demanding cutting data.

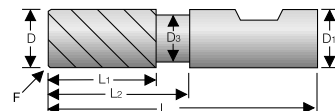
**Features:**

- Ø range 4 - 20 mm
- Unequal helix pitch (41°/44°)
- Optimised cutting edge design (multi-chamfer grinding)
- Perfect for modern milling strategies

## ATORN® HPC Power end milling cutter, universal



- Irregular helix angle and pitch for low-vibration milling
- With protective chamfer F for improved tool life and stable face milling, double protected
- Optimised face-cutter geometry with large chip spaces
- With clearance
- ULTRA coated for maximum service life



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		180-220	140-180	100-150	100-130	100-120	80-100	150-170	150-170	50-80	30-50	30-50	280-320	240-280	180-220					

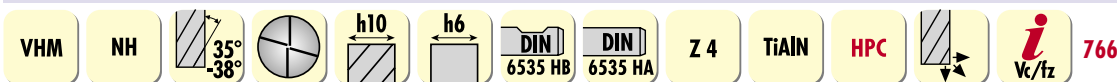
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4	8	12	54	3.8	6	0.1	0.04	0.06	254503 0040	40,60
5	10	15	54	4.8	6	0.15	0.05	0.08	254503 0050	40,60
6	13	21	57	5.7	6	0.2	0.06	0.1	254503 0060	40,60
8	19	27	63	7.7	8	0.2	0.08	0.12	254503 0080	48,-
10	22	32	72	9.7	10	0.2	0.1	0.14	254503 0100	65,60
12	26	38	83	11.6	12	0.2	0.12	0.18	254503 0120	98,70
14	26	38	83	13.6	14	0.3	0.16	0.2	254503 0140	133,50
16	32	44	92	15.6	16	0.3	0.16	0.2	254503 0160	150,50
18	32	44	92	17.6	18	0.3	0.2	0.26	254503 0180	190,-
20	38	54	104	19.6	20	0.3	0.2	0.26	254503 0200	224,-

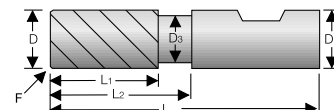


2119

## ATORN® HPC Power end milling cutter, steel



- Irregular helix angle and pitch for low-vibration milling
- With protective chamfer F for improved tool life and stable face milling, double protected
- Optimised face-cutter geometry with large chip spaces
- Radius-shaped face gashing for improved chip removal
- Defined cutting-edge rounding
- With clearance
- ULTRA coated for maximum service life



material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
			< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
			220-270	180-220	140-180				150-180	130-170											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	DIN 6535-HB art.no.	€	DIN 6535-HA art.no.	€
1	2.5	3	40	0.9	4	0.025	0.008	0.012			254510 0010	41,50
2	4	6	40	1.8	4	0.05	0.014	0.014			254510 0020	41,50
3	6	9	40	2.8	4	0.075	0.02	0.03			254510 0030	41,50
4	8	12	54	3.8	6	0.1	0.04	0.06	254511 0040	41,50	254510 0040	41,50
5	10	15	54	4.8	6	0.15	0.06	0.08	254511 0050	41,50	254510 0050	41,50
6	13	21	57	5.7	6	0.2	0.07	0.1	254511 0060	41,50	254510 0060	41,50
8	19	27	63	7.7	8	0.2	0.09	0.12	254511 0080	46,10	254510 0080	46,10
10	22	32	72	9.7	10	0.2	0.11	0.14	254511 0100	65,60	254510 0100	65,60
12	26	38	83	11.6	12	0.2	0.13	0.18	254511 0120	96,20	254510 0120	96,20
14	26	38	83	13.6	14	0.3	0.18	0.2	254511 0140	137,50	254510 0140	137,50
16	32	44	92	15.6	16	0.3	0.18	0.2	254511 0160	150,50	254510 0160	150,50
18	32	44	92	17.6	18	0.3	0.22	0.26	254511 0180	194,50	254510 0180	194,50
20	38	54	104	19.6	20	0.3	0.22	0.26	254511 0200	231,-	254510 0200	231,-

2119

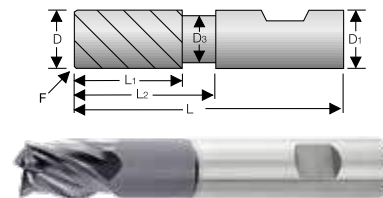
2119

Continued on next page >>>

Extra-long

D	L1	L2	L	D3	D1	F x 45°	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	DIN 6535-HB art.no.	€
6	9	29	65	5.7	6	0.2	0.07	0.1	254513 0060	48,-
8	12	39	75	7.7	8	0.2	0.09	0.12	254513 0080	58,50
10	15	40	80	9.6	10	0.2	0.11	0.14	254513 0100	77,30
12	18	48	93	11	12	0.2	0.13	0.18	254513 0120	119,-
16	24	60	108	15	16	0.3	0.18	0.2	254513 0160	171,-
20	30	76	126	19	20	0.3	0.22	0.26	254513 0200	263,-

2119

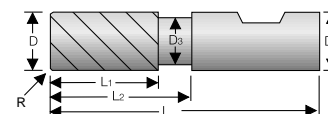


ATORN® HPC Power end milling cutter, stainless steel

VHM NH Z 4 TiAlN HPC

• Irregular helix angle and pitch for low-vibration milling

- New edge protection in the form of multi-chamfer grinding
- Optimised gashing in the centre
- Micro-cutting preparation on all cutting edges
- With clearance
- Wear-resistant and temperature-resistant **Ultra-M** coating



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
					●	●	●			●	●	●	●	●	●				
					115-135	100-120	90-110			60-80	40-60	40-60	280-320	260-300	260-300				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L2	L	D3	D1	R	Z	Feed fz stainless steel mm/tooth	Feed fz stainless steel austenitic mm/tooth	DIN 6535-HA art.no.	€	DIN 6535-HB art.no.	€
4	8	12	54	3.8	6	0.15	4	0.03	0.05	254516 0040	46,10	254517 0040	46,10
5	10	15	54	4.8	6	0.2	4	0.04	0.06	254516 0050	46,10	254517 0050	46,10
6	13	21	57	5.7	6	0.3	4	0.04	0.06	254516 0060	46,10	254517 0060	46,10
8	19	27	63	7.7	8	0.3	4	0.06	0.08	254516 0080	50,30	254517 0080	50,30
10	22	32	72	9.7	10	0.3	4	0.07	0.09	254516 0100	70,70	254517 0100	70,70
12	26	38	83	11.6	12	0.3	4	0.09	0.11	254516 0120	104,-	254517 0120	104,-
16	32	44	92	15.6	16	0.4	4	0.11	0.13	254516 0160	161,-	254517 0160	161,-
20	38	54	104	19.6	20	0.4	4	0.14	0.16	254516 0200	253,-	254517 0200	253,-

2119

2119



WHEN  
**ADDITIVE**  
IS A FAMILIAR WORD IN  
**MANUFACTURING.**

THAT'S POWER TO PRODUCE

**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE





## Trochoidal milling

INFO

				
Brand	<b>ATORN®</b>	<b>ATORN®</b>	<b>HPMT</b>	<b>ATORN®</b>
ISO	<b>P</b>	<b>M</b>	<b>P M K S</b>	<b>N</b>
Number of cutting edges	5	5	5	4
Diameter range / mm	6-20	6-20	4-20	4-20
Standard	WN	WN	WN	WN
Version	N	N	N	WN
Type/profile	TVC	TVC	TVC	TVC
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlTiN	TiAlSiN	AlCRN	
Item number	254155	254157	254235	254159
<b>Page</b>	<b>496</b>	<b>497</b>	<b>498</b>	<b>498</b>



YOUR DRILL

# GIVES UP. • WHAT DO YOU DO? YOU REACH FOR A NEW ONE

AND SIMPLY CARRY ON:  
SARA®GO TOOL DISPENSING SYSTEM.

THAT'S POWER TO PRODUCE

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE



# ATORN® Trochoidal end milling cutter (steel)

VHM
Typ N





Z 5
Z 4
AlTiN
TVC

Vc/fz
800

- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- Rounded chip space for improved chip removal
- **ae max. 20 %**

**Trochoidal**

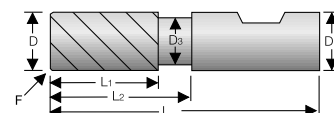


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●																
		250	180	140																

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### 3 x D

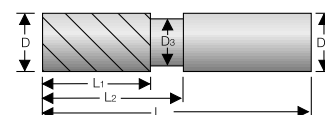
D	L1	L2	L	D3	D1	F	Z	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm		steel < 1000 N/mm <sup>2</sup> mm/tooth		
6.0	19.0	21.0	62	5.8	6	0.12	5	0.050	254155 0060	58,-
8.0	26.0	28.0	68	7.8	8	0.16	5	0.065	254155 0080	75,30
10.0	32.0	32.0	80	9.8	10	0.20	5	0.080	254155 0100	95,60
12.0	38.0	42.0	93	11.8	12	0.24	5	0.095	254155 0120	124,50
16.0	50.0	56.0	108	15.8	16	0.32	5	0.13	254155 0160	212,-
20.0	62.0	70.0	126	19.8	20	0.40	5	0.16	254155 0200	326,-



2153

### 4 x D

D	L1	L	D3	D1	F	Z	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm		steel < 1000 N/mm <sup>2</sup> mm/tooth		
6.0	25	70	5.8	6	0.12	4	0.050	254156 0060	64,10
8.0	34.0	80	7.8	8	0.16	4	0.065	254156 0080	83,40
10.0	42.0	95	9.8	10	0.20	4	0.080	254156 0100	108,-
12.0	50.0	105	11.8	12	0.24	4	0.095	254156 0120	138,50
16.0	66	125	15.8	16	0.32	4	0.13	254156 0160	238,-



2153



Ground sharp ...

... optimal chip control.

**ATORN®**  
Performance demands quality

## ATORN® Trochoidal end milling cutter (stainless steel)



- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- Irregular tooth pitch for a strong head centre
- **ae max. 15 %**

**Trochoidal**

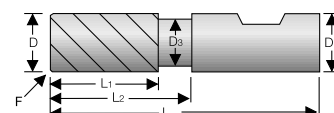


material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
					140	100	75												

Cutting speed Vc m./min. Please adjust these guidelines according to clamping operation and machine set-up.

### 3 x D

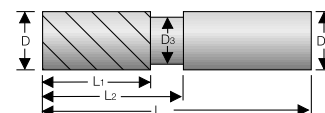
D	L1	L2	L	D3	D1	F	Z	Feed fz stainless steel ferrit./martens. mm/tooth	art.no.	€
6.0	19.0	21.0	62	5.8	6	0.12	5	0.050	254157 0060	70,20
8.0	26.0	28.0	68	7.8	8	0.16	5	0.065	254157 0080	92,60
10.0	32.0	35.0	80	9.8	10	0.20	5	0.080	254157 0100	120,50
12.0	38.0	42.0	93	11.8	12	0.24	5	0.095	254157 0120	142,50
16.0	50.0	56.0	108	15.8	16	0.32	5	0.13	254157 0160	249,-
20.0	62.0	70.0	126	19.8	20	0.40	5	0.16	254157 0200	385,-



2153

### 4 x D

D	L1	L	D3	D1	F	Z	Feed fz stainless steel ferrit./martens. mm/tooth	art.no.	€
6.0	25.0	70	5.8	6	0.12	4	0.050	254158 0060	78,40
8.0	34.0	80	7.8	8	0.16	4	0.065	254158 0080	104,-
10.0	42.0	95	9.8	10	0.20	4	0.080	254158 0100	132,50
12.0	50.0	105	11.8	12	0.24	4	0.095	254158 0120	161,-
16.0	66.0	125	15.8	16	0.32	4	0.13	254158 0160	277,-



2153

FOR **3000 CHUCKS**  
 FIND THE RIGHT CLAMPING JAWS.  
 AND DO IT  
**BLINDFOLDED.**

ALL IT TAKES IS A FEW CLICKS:  
**CLAMPING JAWS FINDER**

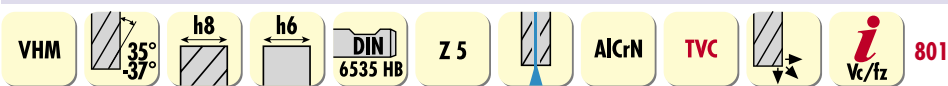
THAT'S POWER TO PRODUCE

**SARATOOLS.com**

**POWER TO PRODUCE**

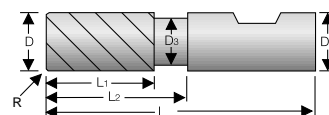
A BRAND OF SARTORIUS WERKZEUGE

## HPMT End milling cutter Trochoidal 2.5 x D / 3.5 x D



- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- **With internal coolant supply**

**Trochoidal**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
254235 2,5xD....	●	275	240	220	●	●		●	●	●	○	○								
254236 3,5xD....	●	200	180	150	●	●		●	●	●	○	○								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### 2.5 x D

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	art.no.	€
4	10	15	57	3.7	6	0.1	254235 0040	59,40
6	15	20	57	5.5	6	0.1	254235 0060	59,40
8	20	25	64	7.4	8	0.2	254235 0080	83,10
10	25	30	72	9.2	10	0.2	254235 0100	121,50
12	30	40	83	11	12	0.3	254235 0120	162,50
16	40	50	92	15	16	0.3	254235 0160	267,-
20	50	60	104	19	20	0.3	254235 0200	410,-

2180



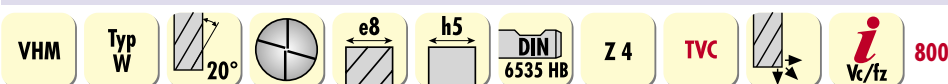
### 3.5 x D

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	art.no.	€
6	26	32	75	5.5	6	0.1	254236 0060	107,50
8	32	38	75	7.4	8	0.2	254236 0080	144,50
10	42	52	100	9.2	10	0.2	254236 0100	183,50
12	48	60	100	11	12	0.3	254236 0120	228,-
16	60	68	125	15	16	0.3	254236 0160	380,-
20	70	78	125	19	20	0.3	254236 0200	539,-

2180

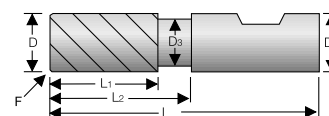


## ATORN® Trochoidal end milling cutter (aluminium)



- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- **Cutting material: superfine grain solid carbide**
- Polished cutting edges for perfect chip removal
- **ae max. 30 %**

**Trochoidal**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
	●												●	●						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4.0	13.0	14.0	62	3.8	6	0.08	0.06	254159 0040	44,30
5.0	16.0	17.5	62	4.8	6	0.10	0.08	254159 0050	44,30
6.0	19.0	21.0	62	5.8	6	0.12	0.1	254159 0060	44,30
8.0	26.0	28.0	68	7.8	8	0.16	0.12	254159 0080	54,50
10.0	32.0	35.0	80	9.8	10	0.20	0.15	254159 0100	93,60
12.0	38.0	42.0	93	11.8	12	0.24	0.17	254159 0120	127,50
16.0	50.0	56.0	108	15.8	16	0.32	0.20	254159 0160	234,-
20.0	62.0	70.0	126	19.8	20	0.40	0.25	254159 0200	346,-

2153





## The ULTRA-N high-speed milling range for the milling of aluminium

With the new ATORN range, Sartorius offers a complete milling range for machining aluminium. The ATORN milling program ULTRA-N sets technical benchmarks here:

- extremely soft cut, optimum chip removal and excellent running smoothness
- short processing times thanks to high usage parameters
- excellent surface quality
- no or minimal burr formation
- Precision thanks to low manufacturing tolerances
- coating specially designed for machining aluminium



Overview of the range		Z	Ultra-N	standard	short	long	extra long	HA	HB	Ø-area mm	Page
Solid carbide, single cutting edge end milling cutter		1		●				●		Ø 1,5 - 16	500
Solid carbide mini end milling cutters		2		●				●		Ø 0,5 - 2,5	501
Solid carbide slot drills		2		●				●	●	Ø 3 - 20	501
Solid carbide end milling cutters		3			●			●	●	Ø 3 - 20	503
						●		●		Ø 3 - 20	503
Solid carbide end milling cutter with edge protection F		3			●			●	●	Ø 3 - 20	504
						●		●		Ø 3 - 20	505
Solid carbide end milling cutter with internal cooling		3			●			●		Ø 4 - 16	505
Solid carbide end milling cutters with edge protection F		4			●			●	●	Ø 3 - 20	506
						●		●		Ø 4 - 16	506
							●		●		Ø 6 - 16
Solid carbide end milling cutters HPC with edge protection F Unequal helix angle 35° - 38°		4			●			●		Ø 3 - 20	507
						●		●		Ø 4 - 20	507
Solid carbide end milling cutter with internal cooling and face chip breaker		4		●				●		Ø 6 - 20	508
Solid carbide roughing cutters		3		●				●	●	Ø 6 - 20	509
Solid carbide roughing cutter with internal cooling		3			●			●		Ø 6 - 20	509
Solid carbide mini-torus cutter		2		●				●		Ø 0,5 - 2,5	510
Solid carbide torus cutters		2			●			●		Ø 3 - 16	511
						●		●		Ø 3 - 16	511
							●		●		Ø 6 - 16
Solid carbide torus cutters		3		●				●	●	Ø 5 - 20	512
Solid carbide mini-radius milling cutter		2		●				●		Ø 0,5 - 2,5	514
Solid carbide torus milling cutter with internal cooling and face chip breaker		4		●				●		Ø 10 - 20	513
Solid carbide radius milling cutters		2			●			●		Ø 3 - 16	515
						●		●		Ø 3 - 16	515
							●		●		Ø 3 - 12

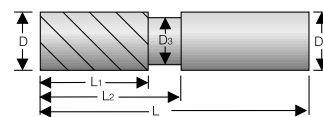


material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ nagyon alkalmas	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●	●				

## ATORN® Ultra-N single-blade end milling cutter

VHM Typ W 30° h9 h5 DIN 6535 HA Z 1 Vc/fz 775

- With clearance
- With defined cutting edge rounding
- Polished version, sharp-edged, ground
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished version**
- Large chip space for unhindered chip removal



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
249100....												●	●	●	●				
249700....												●	●	●	●				

350-500 150-250 150-350 200-350  
150-250 350-500 150-350 200-350

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L	L2	D3	D1	Feed fz	Feed fz	Mirror finish		polished	
								aluminium < 8 % Si	aluminium < 8 % Si	art.no.	€
1.5	6	50	22.0	1.45	3	0.0175	0.025	249100 0015	25,50	249700 0015	27,30
2.0	8	50	22.0	1.8	3	0.02555	0.0365	249100 0020	27,10	249700 0020	29,10
3.0	12	50	22.0	2.8	3	0.04025	0.0575	249100 0030	27,70	249700 0030	29,80
4.0	15	57	29.0	3.8	4	0.0455	0.065	249100 0040	31,-	249700 0040	33,20
5.0	17	60	32.0	4.8	5	0.056	0.08	249100 0050	37,30	249700 0050	39,90
6.0	20	64	28.0	5.8	6	0.06825	0.0975	249100 0060	38,90	249700 0060	41,60
8.0	24	64	28.0	7.8	8	0.08225	0.1175	249100 0080	56,-	249700 0080	59,70
10.0	25	73	33.0	9.7	10	0.091	0.13	249100 0100	85,50	249700 0100	91,20
12.0	32	84	39.0	11.7	12	0.105	0.15	249100 0120	108,-	249700 0120	115,-
16.0	38	93	45.0	15.7	16	0.1155	0.165	249100 0160	157,-	249700 0160	168,-

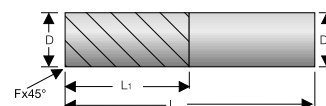
2149 2149



## VAN HOORN CARBIDE Single-blade end milling cutter

VHM 30° e8 h5 DIN 6535 HA Z 1 HSC Vc/fz 775

- Especially for machining non-ferrous materials



material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
			< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	○					

100-400 100-250 100-200

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

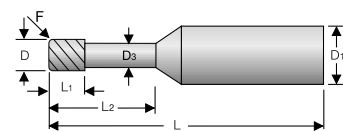
D	D1	L1	L	F x 45°	Feed fz	Feed fz	art.no.		€	
							aluminium < 8 % Si	aluminium < 8 % Si	art.no.	€
0.6	3	3	38	-	0.00875	0.0125	250001 0006	37,20		
0.8	3	4	38	-	0.0112	0.016	250001 0008	37,20		
1.0	3	5	38	-	0.01225	0.0175	250001 0010	35,70		
1.2	3	5	38	-	0.01435	0.0205	250001 0012	35,70		
1.5	3	5	38	-	0.0175	0.025	250001 0015	35,70		
1.6	3	6	38	-	0.01995	0.0285	250001 0016	34,-		
1.8	3	7	38	-	0.02205	0.0315	250001 0018	34,-		
2.0	3	8	38	-	0.02765	0.0395	250001 0020	29,30		
2.5	3	9	38	-	0.0329	0.047	250001 0025	29,30		
3.0	3	12	38	0.10	0.04025	0.0575	250001 0030	28,70		
4.0	4	12	50	0.10	0.0455	0.065	250001 0040	31,-		
5.0	5	15	50	0.15	0.056	0.08	250001 0050	37,50		
6.0	6	16	50	0.20	0.06825	0.0975	250001 0060	37,-		
7.0	7	20	60	0.20	0.07525	0.1075	250001 0070	52,40		
8.0	8	20	60	0.25	0.08575	0.1225	250001 0080	50,30		
10.0	10	22	70	0.30	0.105	0.15	250001 0100	72,80		
12.0	12	25	75	0.35	0.1295	0.185	250001 0120	91,10		

2112



Also very good for synthetic materials

## ATORN® Ultra-N mini end milling cutter



- With clearance
- 2 cutting edges, with edge chamfer F
- With defined cutting edge rounding from Ø 1.5 mm
- Long-necked version for non-ferrous materials
- Cutting edge tolerance 0/-0.015 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	180-420		< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●				
Cutting speed Vc m/min.													Please adjust these guidelines according to clamping operation and machine set-up.					



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
0.5	0.9	55	4.0	0.48	4	0.05	0.012	249001 0504	48,70
0.5	0.9	65	6.0	0.48	4	0.05	0.012	249001 0506	60,10
0.5	0.9	65	10.0	0.48	4	0.05	0.012	249001 0510	60,10
1.0	1.5	55	5.0	0.95	4	0.10	0.021	249001 1005	48,70
1.0	1.5	65	10.0	0.95	4	0.10	0.021	249001 1010	57,-
1.0	1.5	65	15.0	0.95	4	0.10	0.021	249001 1015	60,10
1.5	1.8	55	8.0	1.44	4	0.10	0.033	249001 1508	48,70
1.5	1.8	65	15.0	1.44	4	0.10	0.033	249001 1515	58,-
1.5	1.8	65	20.0	1.44	4	0.10	0.033	249001 1520	60,10
2.0	2.0	55	10.0	1.92	4	0.10	0.043	249001 2010	48,70
2.0	2.0	65	20.0	1.92	4	0.10	0.043	249001 2020	58,-
2.5	2.5	55	12.0	2.40	4	0.10	0.050	249001 2512	50,10
2.5	2.5	65	20.0	2.40	4	0.10	0.050	249001 2520	60,10

2149

## ATORN® Ultra-N slot drill

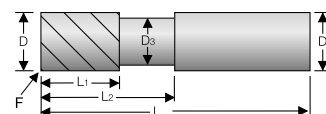


- With clearance
- 2 cutting edges, with edge chamfer F
- With defined cutting edge rounding
- Polished version, sharp-edged, ground
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished version**
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N** coated

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	150-350		< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●				
Cutting speed Vc m/min.													Please adjust these guidelines according to clamping operation and machine set-up.					

### Standard

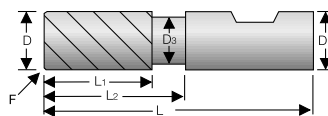
D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	ZrCN DIN 6535-HA art.no.	€
3.0	8	57	18	2.9	6	0.1	0.045	249201 0030	33,40
4.0	11	57	18	3.9	6	0.1	0.053	249201 0040	33,40
5.0	13	57	20	4.9	6	0.1	0.060	249201 0050	33,40
6.0	13	57	20	5.8	6	0.1	0.068	249201 0060	36,30
8.0	19	63	26	7.8	8	0.1	0.075	249201 0080	43,-
10.0	22	72	29	9.7	10	0.2	0.085	249201 0100	54,-
12.0	26	83	36	11.7	12	0.2	0.095	249201 0120	81,40
16.0	32	92	42	15.7	16	0.2	0.110	249201 0160	126,50



2149

Continued on next page >>>





Standard with driving plane

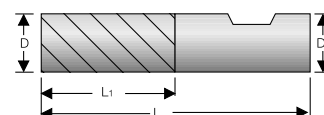
NEW

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	Mirror finish DIN 6535-HB art.no.	€	polished DIN 6535-HB art.no.	€	ZrCN DIN 6535-HB art.no.	€
3.0	8	57	18	2.9	6	0.1	0.045	249200 0030	29,10	249207 0030	31,40	249202 0030	33,40
4.0	11	57	18	3.9	6	0.1	0.053	249200 0040	29,10	249207 0040	31,40	249202 0040	33,40
5.0	13	57	20	4.9	6	0.1	0.060	249200 0050	29,10	249207 0050	31,40	249202 0050	33,40
6.0	13	57	20	5.8	6	0.1	0.068	249200 0060	31,40	249207 0060	33,60	249202 0060	36,30
8.0	19	63	26	7.8	8	0.1	0.075	249200 0080	39,50	249207 0080	42,40	249202 0080	43,-
10.0	22	72	29	9.7	10	0.2	0.085	249200 0100	49,50	249207 0100	53,10	249202 0100	54,-
12.0	26	83	36	11.7	12	0.2	0.095	249200 0120	70,20	249207 0120	75,40	249202 0120	81,40
16.0	32	92	42	15.7	16	0.2	0.110	249200 0160	108,-	249207 0160	115,-	249202 0160	126,50
20.0	38	104	52	19.7	20	0.2	0.125	249200 0200	173,-	249207 0200	185,-		
									2149		2149		2149

VAN HOORN CARBIDE VHLAW end milling cutter



- **Roughing cutter** for a broad range of applications (non-ferrous metals and plastics)
- Highly positive rake and clearance angles as well as sharp cutting edges guarantee
- **very low cutting forces** and **minimal cutting pressure**  
Large chip flutes for reliable chip removal at **up to 50 % higher feed rates**, resulting in shorter machining times



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRF/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	●					
												400-500	150-280	250-300						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

VHLAW finishing version, 25° helix angle

D mm	D1 mm	L1 mm	L mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	6	13	64	0.050	255169 0060	41,60
8.0	8	19	64	0.060	255169 0080	56,-
10.0	10	22	70	0.120	255169 0100	70,70
12.0	12	26	78	0.120	255169 0120	86,50
16.0	16	32	89	0.180	255169 0160	157,-
20.0	20	38	102	0.200	255169 0200	280,-
25.0	25	45	120	0.220	255169 0250	435,-



2112

Over 200,000 tools available online!  
Register online now!



www.saratools.com

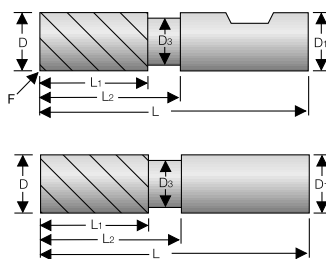
# ATORN® Ultra-N end milling cutter



- With clearance
- 3 cutting edges, sharp-edged
- With defined cutting edge rounding
- Polished version, sharp-edged, ground
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished version**
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N** coated

material	● very well suited	○ well suited	steel			stainless steel		cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
			< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	●					
													350-500	150-250	150-350					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	ZrCN DIN 6535-HA		polished DIN 6535-HB		Mirror finish DIN 6535-HB	
								art.no.	€	art.no.	€	art.no.	€
3.0	12	57	16	2.8	6	0.018	0.025	249304 0030	34,20	249309 0030	32,50	249305 0030	30,40
4.0	12	57	18	3.8	6	0.021	0.030	249304 0040	34,20	249309 0040	32,50	249305 0040	30,40
5.0	15	57	18	4.7	6	0.026	0.038	249304 0050	34,20	249309 0050	32,50	249305 0050	30,40
6.0	16	57	21	5.6	6	0.032	0.045	249304 0060	39,90	249309 0060	35,50	249305 0060	33,20
8.0	22	64	28	7.6	8	0.042	0.060	249304 0080	48,10	249309 0080	44,70	249305 0080	41,50
10.0	25	73	33	9.6	10	0.053	0.075	249304 0100	61,10	249309 0100	56,10	249305 0100	52,90
12.0	28	84	39	11.4	12	0.060	0.085	249304 0120	85,50	249309 0120	79,90	249305 0120	74,30
16.0	35	93	45	15.4	16	0.068	0.098	249304 0160	126,50	249309 0160	115,-	249305 0160	108,-
20.0	40	104	54	19.4	20	0.079	0.113	249304 0200	195,50	249309 0200	194,-	249305 0200	181,50
								2149	2149		2149		

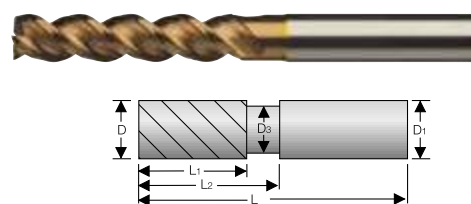
## 4 pcs sets

Contents	ZrCN DIN 6535-HA art.no.	€	Mirror finish DIN 6535-HB art.no.	€
Ø 6, 8, 10, 12 mm	249304 0001	233,-	249305 0001	198,50
	2149		2149	

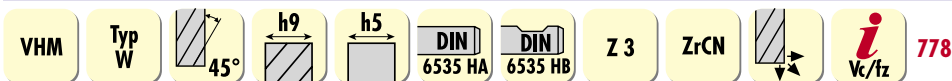


## Long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	ZrCN DIN 6535-HA	
								art.no.	€
3.0	15	64	21	2.8	6	0.020	0.025	249352 0030	39,30
4.0	19	64	27	3.8	6	0.024	0.030	249352 0040	39,30
5.0	20	64	28	4.7	6	0.030	0.038	249352 0050	39,30
6.0	20	64	28	5.6	6	0.036	0.045	249352 0060	47,40
8.0	38	80	44	7.6	8	0.048	0.060	249352 0080	60,10
10.0	45	95	55	9.6	10	0.060	0.075	249352 0100	81,40
12.0	53	100	55	11.4	12	0.068	0.085	249352 0120	108,-
16.0	63	123	75	15.4	16	0.078	0.098	249352 0160	181,50
20.0	65	125	75	19.4	20	0.090	0.113	249352 0200	245,-
								2149	



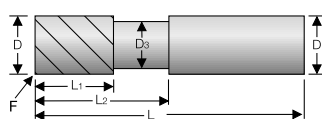
# ATORN® Ultra-N end milling cutter



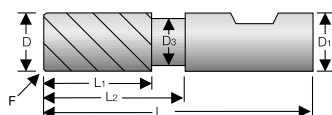
- With clearance
- 3 cutting edges, with edge protection F
- With defined cutting edge rounding
- Polished version, sharp-edged, ground
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished version**
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N** coated

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●					
												350-500	150-250	150-350					

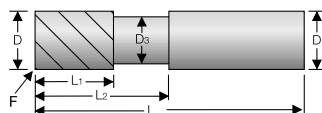
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



Short								●	●	NEW				
D	L1	L	L2	D3	D1	F	Feed fz	Feed fz	Mirror finish	polished	ZrCN			
mm	mm	mm	mm	mm	mm	mm	aluminium < 8 % Si	aluminium < 8 % Si	DIN 6535-HA	DIN 6535-HB	DIN 6535-HB	art.no.	€	
3.0	12	57	16	2.8	6	0.1	0.018	0.025	249300 0030	30,40	249307 0030	32,50	249302 0030	34,20
4.0	12	57	18	3.8	6	0.1	0.021	0.030	249300 0040	30,40	249307 0040	32,50	249302 0040	34,20
5.0	15	57	18	4.7	6	0.1	0.026	0.038	249300 0050	30,40	249307 0050	32,50	249302 0050	34,20
6.0	16	57	21	5.6	6	0.1	0.032	0.045	249300 0060	33,20	249307 0060	35,50	249302 0060	39,90
8.0	22	64	28	7.6	8	0.1	0.042	0.060	249300 0080	41,50	249307 0080	44,70	249302 0080	48,10
10.0	25	73	33	9.6	10	0.2	0.053	0.075	249300 0100	52,90	249307 0100	56,10	249302 0100	61,10
12.0	28	84	39	11.4	12	0.2	0.060	0.085	249300 0120	74,30	249307 0120	79,90	249302 0120	85,50
16.0	35	93	45	15.4	16	0.2	0.068	0.098	249300 0160	108,-	249307 0160	115,-	249302 0160	126,50
20.0	40	104	54	19.4	20	0.2	0.079	0.113	249300 0200	181,50	249307 0200	194,-	249302 0200	195,50
									2149		2149		2149	



Short with driving plane								●	●	NEW				
D	L1	L	L2	D3	D1	F	Feed fz	Feed fz	Mirror finish	polished	ZrCN			
mm	mm	mm	mm	mm	mm	mm	aluminium < 8 % Si	aluminium < 8 % Si	DIN 6535-HB	DIN 6535-HB	DIN 6535-HB	art.no.	€	
3.0	12	57	16	2.8	6	0.1	0.018	0.025	249301 0030	30,40	249308 0030	32,50	249303 0030	34,20
4.0	12	57	18	3.8	6	0.1	0.021	0.030	249301 0040	30,40	249308 0040	32,50	249303 0040	34,20
5.0	15	57	18	4.7	6	0.1	0.026	0.038	249301 0050	30,40	249308 0050	32,50	249303 0050	34,20
6.0	16	57	21	5.6	6	0.1	0.032	0.045	249301 0060	33,20	249308 0060	35,50	249303 0060	39,90
8.0	22	64	28	7.6	8	0.1	0.042	0.060	249301 0080	41,50	249308 0080	44,70	249303 0080	48,10
10.0	25	73	33	9.6	10	0.2	0.053	0.075	249301 0100	52,90	249308 0100	56,10	249303 0100	61,10
12.0	28	84	39	11.4	12	0.2	0.060	0.085	249301 0120	74,30	249308 0120	79,90	249303 0120	85,50
16.0	35	93	45	15.4	16	0.2	0.068	0.098	249301 0160	108,-	249308 0160	115,-	249303 0160	126,50
20.0	40	104	54	19.4	20	0.2	0.079	0.113	249301 0200	181,50	249308 0200	194,-	249303 0200	195,50
									2149		2149		2149	

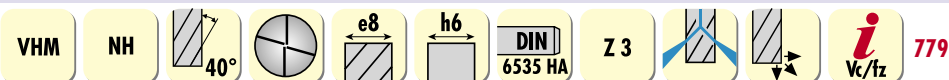


Long

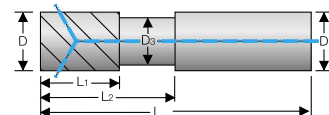
NEW

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz		Mirror finish DIN 6535-HA	polished DIN 6535-HA	ZrCN DIN 6535-HA			
							aluminium < 8 % Si mm/tooth	aluminium < 8 % Si mm/tooth	art.no.	€	art.no.	€	art.no.	€
3.0	15	64	21	2.8	6	0.1	0.020	0.025	249351 0030	34,40	249355 0030	37,-	249350 0030	39,30
4.0	19	64	27	3.8	6	0.1	0.024	0.030	249351 0040	34,40	249355 0040	37,-	249350 0040	39,30
5.0	20	64	28	4.7	6	0.1	0.030	0.038	249351 0050	34,40	249355 0050	37,-	249350 0050	39,30
6.0	20	64	28	5.6	6	0.1	0.036	0.045	249351 0060	41,50	249355 0060	44,70	249350 0060	47,40
8.0	38	80	44	7.6	8	0.1	0.048	0.060	249351 0080	49,10	249355 0080	52,70	249350 0080	60,10
10.0	45	95	55	9.6	10	0.2	0.060	0.075	249351 0100	70,20	249355 0100	75,30	249350 0100	81,40
12.0	53	100	55	11.4	12	0.2	0.068	0.085	249351 0120	96,70	249355 0120	104,-	249350 0120	108,-
16.0	63	123	75	15.4	16	0.2	0.078	0.098	249351 0160	163,-	249355 0160	173,-	249350 0160	181,50
20.0	65	125	75	19.4	20	0.2	0.090	0.113	249351 0200	234,-	249355 0200	250,-	249350 0200	245,-
									2149		2149		2149	

### ATORN® End milling cutter Ultra-N



- with internal coolant supply
- Ø 4 mm and Ø 5 mm with central coolant outlet
- unequal pitch for low-vibration milling
- with clearance
- high material removal rate
- Cutting material: fine-grain SC



material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper Cu-alloy	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	550	355	185	GRP/CFP/thermo.	< 55 HRc	< 60 HRc
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																			

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz		art.no.	€
						aluminium < 8 % Si mm/tooth	aluminium < 8 % Si mm/tooth		
4.0	12	20	50	3.7	6.0	0.017	0.031	249601 0400	35,60
5.0	15	20	50	4.6	6.0	0.024	0.043	249601 0500	35,60
6.0	16	20	50	5.5	6.0	0.034	0.058	249601 0600	56,-
8.0	20	30	64	7.4	8.0	0.050	0.086	249601 0800	63,10
10.0	22	32	70	9.2	10.0	0.068	0.117	249601 1000	82,40
12.0	25	37	75	11.0	12.0	0.085	0.154	249601 1200	130,50
16.0	32	46	90	15.0	16.0	0.134	0.212	249601 1600	187,50

2149



High-gloss polished...

... extremely sharp.

**ATORN®**  
Performance demands quality

# ATORN® Ultra-N end milling cutter

VHM
Typ W
45°
h9
h5
DIN 6535 HA
DIN 6535 HB
Z 4
ZrCN
3D PRINT
Vc/fz 778

- With clearance
- 4 cutting edges, with edge protection F
- With defined cutting edge rounding
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

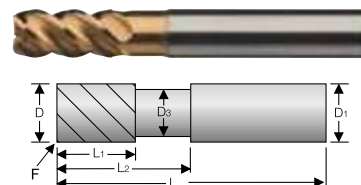
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite ERP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	150-350	150-250	150-350	< 55 HRc	< 60 HRc	≥ 60 HRc	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HA art.no.	€
3.0	6	57	10	2.8	6	0.1	0.021	0.030	249400 0030	42,-
4.0	8	57	14	3.8	6	0.1	0.025	0.035	249400 0040	42,-
5.0	10	57	16	4.7	6	0.1	0.030	0.043	249400 0050	42,-
6.0	12	57	19	5.6	6	0.2	0.033	0.048	249400 0060	45,-
8.0	16	63	25	7.6	8	0.2	0.042	0.060	249400 0080	55,-
10.0	20	72	30	9.6	10	0.2	0.053	0.075	249400 0100	74,30
12.0	24	83	36	11.4	12	0.2	0.060	0.085	249400 0120	92,60
16.0	32	92	42	15.4	16	0.2	0.077	0.110	249400 0160	169,-
20.0	40	104	52	19.4	20	0.2	0.126	0.180	249400 0200	224,-

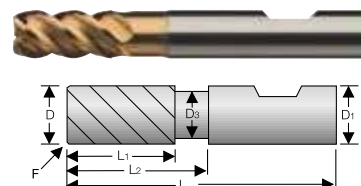
2149



## Short with driving plane

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HB art.no.	€
3.0	6	57	10	2.8	6	0.1	0.021	0.030	249401 0030	42,-
4.0	8	57	14	3.8	6	0.1	0.025	0.035	249401 0040	42,-
5.0	10	57	16	4.7	6	0.1	0.030	0.043	249401 0050	42,-
6.0	12	57	19	5.6	6	0.2	0.033	0.048	249401 0060	45,-
8.0	16	63	25	7.6	8	0.2	0.042	0.060	249401 0080	55,-
10.0	20	72	30	9.6	10	0.2	0.053	0.075	249401 0100	74,30
12.0	24	83	36	11.4	12	0.2	0.060	0.085	249401 0120	92,60
16.0	32	92	42	15.4	16	0.2	0.077	0.110	249401 0160	169,-
20.0	40	104	52	19.4	20	0.2	0.126	0.180	249401 0200	224,-

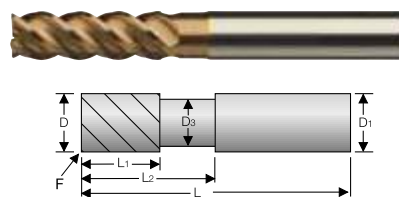
2149



## Long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HA art.no.	€
4.0	16	62	22	3.8	6	0.1	0.032	0.035	249450 0040	48,50
5.0	17	62	24	4.7	6	0.1	0.038	0.043	249450 0050	49,10
6.0	18	62	24	5.6	6	0.2	0.043	0.048	249450 0060	55,-
8.0	24	72	30	7.6	8	0.2	0.054	0.060	249450 0080	70,20
10.0	30	80	38	9.6	10	0.2	0.068	0.075	249450 0100	92,60
12.0	36	93	46	11.4	12	0.2	0.077	0.085	249450 0120	120,50
16.0	48	108	58	15.4	16	0.2	0.099	0.110	249450 0160	214,-

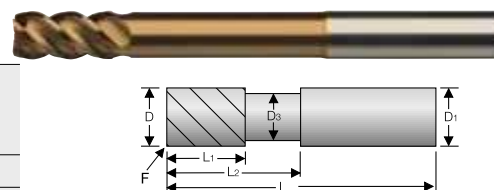
2149



## Extra-long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HA art.no.	€
6.0	12	80	42	5.6	6	0.2	0.038	0.048	249460 0060	64,10
8.0	16	100	58	7.6	8	0.2	0.048	0.060	249460 0080	92,60
10.0	20	100	62	9.6	10	0.2	0.060	0.075	249460 0100	116,-
12.0	24	120	75	11.4	12	0.2	0.068	0.085	249460 0120	163,-
16.0	32	150	100	15.4	16	0.2	0.088	0.110	249460 0160	254,-

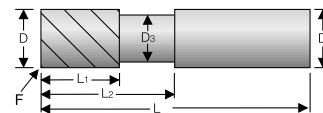
2149



## ATORN® Ultra-N end milling cutter

VHM Typ W Z 4 ZrCN HPC 782

- With clearance
- 4 cutting edges, with edge protection F
- With defined cutting edge rounding
- For non-ferrous materials
- Irregular helix angle for vibration-free milling
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc
													●	●	●			
													350-500	150-250	150-350			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Short

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	6	57	10	2.8	6	0.1	0.019	0.028	249480 0030	44,20
4.0	8	57	14	3.8	6	0.1	0.023	0.033	249480 0040	44,20
5.0	10	57	16	4.7	6	0.1	0.028	0.040	249480 0050	44,20
6.0	12	57	19	5.6	6	0.2	0.033	0.048	249480 0060	49,10
8.0	16	63	25	7.6	8	0.2	0.042	0.060	249480 0080	64,10
10.0	20	72	30	9.6	10	0.2	0.056	0.072	249480 0100	81,40
12.0	24	83	36	11.4	12	0.2	0.060	0.085	249480 0120	104,-
16.0	32	92	42	15.4	16	0.2	0.077	0.110	249480 0160	169,-
20.0	40	104	52	19.4	20	0.2	0.126	0.180	249480 0200	245,-

2149



### Long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4.0	16	62	22	3.8	6	0.1	0.029	0.033	249490 0040	55,-
5.0	17	62	24	4.7	6	0.1	0.036	0.040	249490 0050	55,-
6.0	18	62	24	5.6	6	0.2	0.043	0.048	249490 0060	60,10
8.0	24	68	30	7.6	8	0.2	0.054	0.060	249490 0080	75,30
10.0	30	80	38	9.6	10	0.2	0.056	0.072	249490 0100	104,-
12.0	36	93	46	11.4	12	0.2	0.077	0.085	249490 0120	130,50
16.0	48	108	58	15.4	16	0.2	0.099	0.110	249490 0160	224,-
20.0	60	126	74	19.4	20	0.2	0.162	0.180	249490 0200	310,-

2149



Freddy®

# Chip vacuum cleaner

For removing ultra-fine particles up to 10 µm

- Removes ultra-fine particles up to 10 µm
- Filtering and cleaning of emulsions
- Especially suited for aluminium machining





# ATORN® End milling cutter Ultra-N

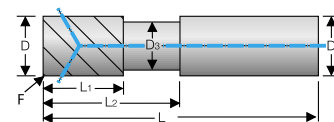
VHM




Z 4


780

- With internal coolant supply
- Irregular helix angle and unequal pitch for low-vibration milling
- With clearance
- With edge chamfer F
- Cutting material: fine grain solid carbide



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel	
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●				
												750	615	200				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Internal cooling

D	L1	L2	L	D3	D1	F	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	aluminium < 8 % Si	aluminium < 8 % Si		
							mm/tooth	mm/tooth		
6.0	13	20	57	5.5	6.0	0.1	0.050	0.069	249605 0600	71,20
8.0	20	26	64	7.4	8.0	0.1	0.067	0.092	249605 0800	90,60
10.0	22	30	72	9.2	10.0	0.2	0.084	0.116	249605 1000	118,-
12.0	26	36	83	11.0	12.0	0.2	0.101	0.139	249605 1200	142,50
14.0	26	38	83	13.0	14.0	0.2	0.118	0.162	249605 1400	172,-
16.0	32	42	92	15.0	16.0	0.2	0.134	0.185	249605 1600	261,-
18.0	32	42	92	17.0	18.0	0.3	0.151	0.208	249605 1800	301,-
20.0	38	52	104	19.0	20.0	0.3	0.168	0.231	249605 2000	375,-

2149



Face-cutter

## Internal cooling and chip breaker

D	L1	L2	L	D3	D1	F	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	aluminium < 8 % Si	aluminium < 8 % Si		
							mm/tooth	mm/tooth		
6.0	13	20	57	5.5	6.0	0.1	0.053	0.073	249607 0600	84,50
8.0	20	26	64	7.4	8.0	0.1	0.071	0.097	249607 0800	108,-
10.0	22	30	72	9.2	10.0	0.2	0.088	0.121	249607 1000	138,50
12.0	26	36	83	11.0	12.0	0.2	0.106	0.146	249607 1200	169,-
14.0	26	38	83	13.0	14.0	0.2	0.123	0.170	249607 1400	219,-
16.0	32	42	92	15.0	16.0	0.2	0.141	0.194	249607 1600	305,-
18.0	32	42	92	17.0	18.0	0.3	0.159	0.218	249607 1800	341,-
20.0	38	52	104	19.0	20.0	0.3	0.176	0.243	249607 2000	440,-

2149

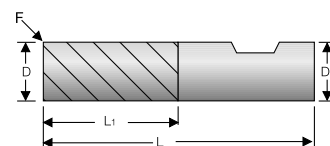


Face-cutter

## VAN HOORN CARBIDE Roughing cutter



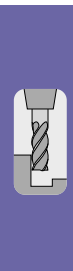
- Very low cutting forces and minimal cutting pressure
- Large chip flutes for reliable chip removal at up to 50 % higher feed rates



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●				
												400-500	150-280	250-300				

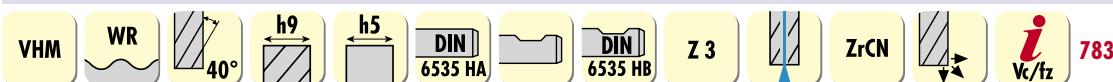
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	D1	F	L1	L	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	6	0.25	16	64	0.031	0.050	255168 0060	61,10
8.0	8	0.50	20	64	0.036	0.060	255168 0080	77,30
10.0	10	0.50	22	70	0.040	0.100	255168 0100	88,50
12.0	12	0.50	25	78	0.048	0.120	255168 0120	105,-
16.0	16	1.00	35	89	0.072	0.180	255168 0160	163,-
20.0	20	1.00	40	102	0.081	0.200	255168 0200	290,-
25.0	25	1.00	50	120	0.090	0.220	255168 0250	440,-



2112

## ATORN® Ultra-N roughing cutter



- With clearance
- 3 cutting edges, with edge protection F
- With defined cutting edge rounding
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, ZrCN Ultra-N-coated
- 249372.... with internal cooling

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●				
												350-500	150-250	150-350				

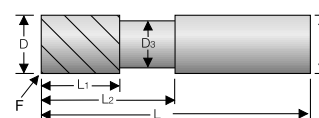
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Standard

D	L1	L	L2	D3	D1	F	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HA art.no.	€	DIN 6535-HA with internal cooling art.no.	€
6.0	13	57	18	5.6	6	0.4	0.039	0.055	249370 0060	44,40	249372 0060	70,20
8.0	21	63	25	7.6	8	0.4	0.049	0.070	249370 0080	60,10	249372 0080	96,70
10.0	22	72	30	9.6	10	0.4	0.060	0.085	249370 0100	67,20	249372 0100	108,-
12.0	26	83	36	11.4	12	0.4	0.067	0.095	249370 0120	85,50	249372 0120	157,-
16.0	36	92	42	15.4	16	0.4	0.084	0.120	249370 0160	142,50	249372 0160	261,-
20.0	41	104	52	19.4	20	0.4	0.140	0.200	249370 0200	214,-	249372 0200	410,-

2149

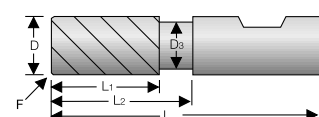
2149



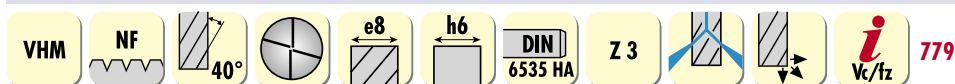
### Standard with driving plane

D	L1	L	L2	D3	D1	F	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HB art.no.	€
6.0	13	57	18	5.6	6	0.4	0.039	0.055	249371 0060	44,40
8.0	21	63	25	7.6	8	0.4	0.049	0.070	249371 0080	60,10
10.0	22	72	30	9.6	10	0.4	0.060	0.085	249371 0100	67,20
12.0	26	83	36	11.4	12	0.4	0.067	0.095	249371 0120	85,50
16.0	36	92	42	15.4	16	0.4	0.084	0.120	249371 0160	142,50
20.0	41	104	52	19.4	20	0.4	0.140	0.200	249371 0200	214,-

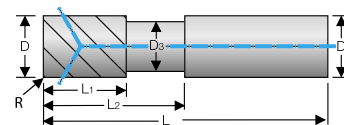
2149



## ATORN® Roughing cutter Ultra-N



- With internal coolant supply
- Unequal pitch for vibration-free milling
- With clearance
- High material removal rate
- Cutting material: fine grain solid carbide



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	●					
													575	375	195					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L2	L	D3	D1	R	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	aluminium < 8 % Si	aluminium < 8 % Si		
							mm/tooth	mm/tooth		
6.0	13	24	60	5.5	6.0	0.1	0.036	0.061	249603 0600	73,30
8.0	20	28	64	7.4	8.0	0.1	0.052	0.090	249603 0800	77,30
10.0	22	35	75	9.2	10.0	0.1	0.071	0.123	249603 1000	104,-
12.0	26	40	75	11.0	12.0	0.12	0.089	0.162	249603 1200	159,-
16.0	32	40	90	15.0	16.0	0.16	0.141	0.223	249603 1600	230,-
20.0	40	50	100	19.0	20.0	0.2	0.169	0.267	249603 2000	318,-

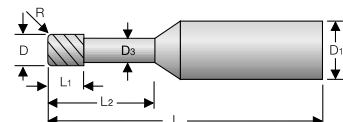
2149



## ATORN® Ultra-N mini torus cutter



- With clearance
- With defined cutting edge rounding from Ø 1.5 mm
- Long-necked version for non-ferrous materials
- Radius tolerance +/- 0.01 mm
- Cutting material: superfine grain solid carbide, ZrCN Ultra-N-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	●					
													400-550	180-320	180-420					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	L1	L	L2	D3	D1	R	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	aluminium < 8 % Si	aluminium < 8 % Si		
							mm/tooth	mm/tooth		
0.5	0.9	55	4.0	0.48	4	0.05	0.008	0.012	249002 0504	50,50
0.5	0.9	65	6.0	0.48	4	0.05	0.008	0.012	249002 0506	60,10
0.5	0.9	65	10.0	0.48	4	0.08	0.008	0.012	249002 0510	60,10
1.0	1.5	55	5.0	0.95	4	0.08	0.014	0.021	249002 1005	50,50
1.0	1.5	65	10.0	0.95	4	0.10	0.014	0.021	249002 1010	60,10
1.0	1.5	65	15.0	0.95	4	0.10	0.014	0.021	249002 1015	60,10
1.5	1.8	55	8.0	1.44	4	0.15	0.023	0.033	249002 1508	50,50
1.5	1.8	65	15.0	1.44	4	0.15	0.023	0.033	249002 1515	60,10
1.5	1.8	65	20.0	1.44	4	0.15	0.023	0.033	249002 1520	60,10
2.0	2.0	55	10.0	1.92	4	0.20	0.030	0.043	249002 2010	50,50
2.0	2.0	65	20.0	1.92	4	0.20	0.030	0.043	249002 2020	60,10
2.5	2.5	55	12.0	2.40	4	0.25	0.035	0.050	249002 2512	50,50
2.5	2.5	65	20.0	2.40	4	0.25	0.035	0.050	249002 2520	60,10

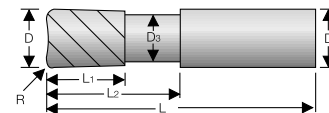
2149



# ATORN® Ultra-N torus cutter

VHM Typ W 30° e8 h5 DIN 6535 HA Z 2 ZrCN Vc/fz 783

- With clearance
- With defined cutting edge rounding
- For non-ferrous materials
- Radius tolerance +/- 0.015 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	175-375	175-275	175-375	< 55 HRc	< 60 HRc	≥ 60 HRc	
												●	●	●						

375-550 175-275 175-375

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	R mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	4	50	14	2.9	3	0.3	0.019	0.028	249211 0303	41,50
4.0	5	50	16	3.8	4	0.3	0.023	0.033	249211 0203	48,50
5.0	6	54	18	4.8	5	0.3	0.028	0.040	249211 0503	54,-
6.0	7	57	21	5.7	6	0.3	0.033	0.048	249211 0603	60,10
6.0	7	57	21	5.7	6	1.0	0.033	0.048	249211 0610	59,-
6.0	7	57	21	5.7	6	2.0	0.033	0.048	249211 0620	60,10
8.0	9	63	27	7.7	8	0.3	0.042	0.060	249211 0803	81,40
8.0	9	63	27	7.7	8	1.0	0.042	0.060	249211 0810	79,40
8.0	9	63	27	7.7	8	2.0	0.042	0.060	249211 0820	81,40
10.0	11	72	32	9.6	10	0.3	0.053	0.075	249211 1003	104,-
10.0	11	72	32	9.6	10	1.5	0.053	0.075	249211 1015	104,-
10.0	11	72	32	9.6	10	3.0	0.053	0.075	249211 1030	108,-
12.0	12	83	38	11.6	12	1.5	0.060	0.085	249211 1215	140,50
12.0	12	83	38	11.6	12	4.0	0.060	0.085	249211 1240	146,50
16.0	16	92	44	15.5	16	2.0	0.077	0.110	249211 1620	234,-
16.0	16	92	44	15.5	16	4.0	0.077	0.110	249211 1640	234,-

2149



## Long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	R mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	4	75	32	2.8	3	0.3	0.025	0.028	249212 0303	60,10
4.0	5	75	36	3.75	4	0.3	0.029	0.033	249212 0203	65,10
5.0	6	75	40	4.7	5	0.3	0.036	0.040	249212 0503	72,30
6.0	7	80	44	5.6	6	0.3	0.043	0.048	249212 0603	77,30
6.0	7	80	44	5.6	6	1.0	0.043	0.048	249212 0610	77,30
6.0	7	80	44	5.6	6	2.0	0.043	0.048	249212 0620	77,30
8.0	9	100	54	7.6	8	0.3	0.054	0.060	249212 0803	108,-
8.0	9	100	54	7.6	8	1.0	0.054	0.060	249212 0810	108,-
8.0	9	100	54	7.6	8	2.0	0.054	0.060	249212 0820	108,-
10.0	11	100	60	9.5	10	0.3	0.068	0.075	249212 1003	146,50
10.0	11	100	60	9.5	10	1.5	0.068	0.075	249212 1015	146,50
10.0	11	100	60	9.5	10	3.0	0.068	0.075	249212 1030	146,50
12.0	12	120	75	11.5	12	1.5	0.077	0.085	249212 1215	183,50
12.0	12	120	75	11.5	12	4.0	0.077	0.085	249212 1240	187,50
16.0	16	150	92	15.5	16	2.0	0.099	0.110	249212 1620	326,-
16.0	16	150	92	15.5	16	4.0	0.099	0.110	249212 1640	326,-

2149



Continued on next page >>>



Extra-long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	R mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	7	120	80	5.6	6	0.3	0.038	0.048	249213 0603	120,50
6.0	7	120	80	5.6	6	1.0	0.038	0.048	249213 0610	120,50
8.0	9	130	90	7.6	8	0.3	0.048	0.060	249213 0803	152,-
8.0	9	130	90	7.6	8	1.0	0.048	0.060	249213 0810	152,-
8.0	9	130	90	7.6	8	2.0	0.048	0.060	249213 0820	152,-
10.0	11	150	110	9.5	10	0.3	0.060	0.075	249213 1003	181,50
10.0	11	150	110	9.5	10	3.0	0.060	0.075	249213 1030	181,50
12.0	12	160	115	11.5	12	1.5	0.060	0.075	249213 1215	271,-
12.0	12	160	115	11.5	12	4.0	0.060	0.075	249213 1240	271,-
16.0	16	200	140	15.5	16	2.0	0.088	0.110	249213 1620	430,-

2149

ATORN® Ultra-N torus cutter

VHM Typ W 45° h9 h5 DIN 6535 HA DIN 6535 HB Z 3 ZrCN Vc/fz 783

- With clearance
- With defined cutting edge rounding
- For non-ferrous materials
- Radius tolerance +/- 0.015 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

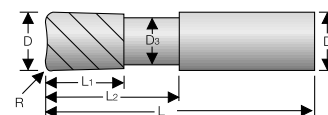
material	steel			stainless steel			cast iron		titanium alloys		superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/EPF/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	●					
													375-550	175-275	175-375					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Standard

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	R mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HA art.no.	€
5.0	13	57	18	4.7	6	0.5	0.026	0.038	249311 0505	44,60
5.0	13	57	18	4.7	6	1.0	0.026	0.038	249311 0510	44,60
6.0	13	57	18	5.6	6	0.5	0.032	0.045	249311 0605	50,10
6.0	13	57	18	5.6	6	1.0	0.032	0.045	249311 0610	50,10
8.0	21	63	25	7.6	8	0.5	0.042	0.060	249311 0805	59,-
8.0	21	63	25	7.6	8	1.0	0.042	0.060	249311 0810	59,-
10.0	22	72	30	9.6	10	0.5	0.053	0.075	249311 1005	92,60
10.0	22	72	30	9.6	10	1.0	0.053	0.075	249311 1010	92,60
12.0	26	83	36	11.4	12	0.5	0.060	0.085	249311 1205	126,50
12.0	26	83	36	11.4	12	1.0	0.060	0.085	249311 1210	126,50
16.0	36	92	42	15.4	16	2.0	0.068	0.098	249311 1620	234,-
16.0	36	92	42	15.4	16	4.0	0.068	0.098	249311 1640	234,-
20.0	41	104	52	19.4	20	4.0	0.079	0.113	249311 2040	336,-

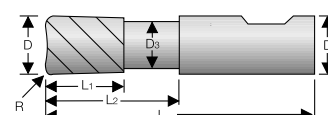
2149



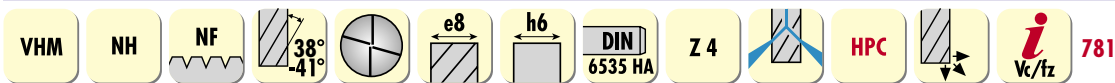
Standard with driving plane

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	R mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HB art.no.	€
5.0	13	57	18	4.7	6	0.5	0.026	0.038	249312 0505	44,60
5.0	13	57	18	4.7	6	1.0	0.026	0.038	249312 0510	44,60
6.0	13	57	18	5.6	6	0.5	0.032	0.045	249312 0605	50,10
6.0	13	57	18	5.6	6	1.0	0.032	0.045	249312 0610	50,10
8.0	21	63	25	7.6	8	0.5	0.042	0.060	249312 0805	59,-
8.0	21	63	25	7.6	8	1.0	0.042	0.060	249312 0810	59,-
10.0	22	72	30	9.6	10	0.5	0.053	0.075	249312 1005	92,60
10.0	22	72	30	9.6	10	1.0	0.053	0.075	249312 1010	92,60
12.0	26	83	36	11.4	12	0.5	0.060	0.085	249312 1205	126,50
12.0	26	83	36	11.4	12	1.0	0.060	0.085	249312 1210	126,50
16.0	36	92	42	15.4	16	2.0	0.068	0.098	249312 1620	234,-
16.0	36	92	42	15.4	16	4.0	0.068	0.098	249312 1640	234,-
20.0	41	104	52	19.4	20	4.0	0.079	0.113	249312 2040	336,-

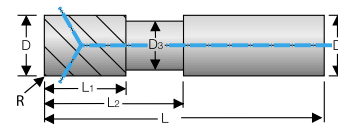
2149



# ATORN® Torus milling cutter Ultra-N



- With internal coolant supply
- Irregular helix angle and unequal pitch for low-vibration milling
- With clearance
- With defined cutting edge rounding
- Cutting material: fine grain solid carbide



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	●					
													750	615	200					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Internal cooling

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	●	●	art.no.	€
							Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth		
10.0	22	30	72	9.2	10.0	2.0	0.084	0.116	249609 1020	130,50
10.0	22	30	72	9.2	10.0	2.5	0.084	0.116	249609 1025	130,50
10.0	22	30	72	9.2	10.0	3.0	0.084	0.116	249609 1030	130,50
10.0	22	30	72	9.2	10.0	4.0	0.084	0.116	249609 1040	130,50
12.0	26	36	83	11.0	12.0	2.0	0.101	0.139	249609 1220	157,-
12.0	26	36	83	11.0	12.0	2.5	0.101	0.139	249609 1225	157,-
12.0	26	36	83	11.0	12.0	3.0	0.101	0.139	249609 1230	157,-
12.0	26	36	83	11.0	12.0	4.0	0.101	0.139	249609 1240	157,-
16.0	32	42	92	15.0	16.0	2.0	0.134	0.185	249609 1620	285,-
16.0	32	42	92	15.0	16.0	2.5	0.134	0.185	249609 1625	285,-
16.0	32	42	92	15.0	16.0	3.0	0.134	0.185	249609 1630	285,-
16.0	32	42	92	15.0	16.0	4.0	0.134	0.185	249609 1640	285,-
20.0	38	52	104	19.0	20.0	2.0	0.168	0.231	249609 2020	410,-
20.0	38	52	104	19.0	20.0	2.5	0.168	0.231	249609 2025	410,-
20.0	38	52	104	19.0	20.0	3.0	0.168	0.231	249609 2030	410,-
20.0	38	52	104	19.0	20.0	4.0	0.168	0.231	249609 2040	410,-

2149



## Internal cooling and chip breaker

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	●	●	art.no.	€
							Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth		
10.0	22	30	72	9.2	10.0	2.0	0.088	0.121	249611 1020	146,50
10.0	22	30	72	9.2	10.0	2.5	0.088	0.121	249611 1025	146,50
10.0	22	30	72	9.2	10.0	3.0	0.088	0.121	249611 1030	146,50
10.0	22	30	72	9.2	10.0	4.0	0.088	0.121	249611 1040	146,50
12.0	26	36	83	11.0	12.0	2.0	0.106	0.146	249611 1220	177,-
12.0	26	36	83	11.0	12.0	2.5	0.106	0.146	249611 1225	177,-
12.0	26	36	83	11.0	12.0	3.0	0.106	0.146	249611 1230	177,-
12.0	26	36	83	11.0	12.0	4.0	0.106	0.146	249611 1240	177,-
16.0	32	42	92	15.0	16.0	2.0	0.141	0.194	249611 1620	326,-
16.0	32	42	92	15.0	16.0	2.5	0.141	0.194	249611 1625	326,-
16.0	32	42	92	15.0	16.0	3.0	0.141	0.194	249611 1630	326,-
16.0	32	42	92	15.0	16.0	4.0	0.141	0.194	249611 1640	326,-
20.0	38	52	104	19.0	20.0	2.0	0.176	0.243	249611 2020	465,-
20.0	38	52	104	19.0	20.0	2.5	0.176	0.243	249611 2025	465,-
20.0	38	52	104	19.0	20.0	3.0	0.176	0.243	249611 2030	465,-
20.0	38	52	104	19.0	20.0	4.0	0.176	0.243	249611 2040	465,-

2149

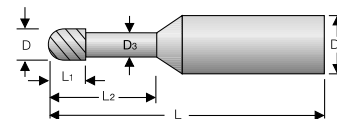




## ATORN® Ultra-N mini radius milling cutter

VHM Typ W 30° e8 h5 DIN 6535 HA Z 2 ZrCN 3D PRINT *i* Vc/fz 784

- With clearance
- With defined cutting edge rounding from Ø 1.5 mm
- Long-necked version for non-ferrous materials
- Radius tolerance +/- 0.01 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	●				
													400-550	180-320	180-420				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
0.5	0.9	55	4.0	0.48	4	0.009	0.014	249003 0504	49,50
0.5	0.9	65	6.0	0.48	4	0.009	0.014	249003 0506	59,-
0.5	0.9	65	10.0	0.48	4	0.009	0.014	249003 0510	59,-
1.0	1.5	55	5.0	0.95	4	0.018	0.025	249003 1005	49,50
1.0	1.5	65	10.0	0.95	4	0.018	0.025	249003 1010	59,-
1.0	1.5	65	15.0	0.95	4	0.018	0.025	249003 1015	59,-
1.5	1.8	55	8.0	1.44	4	0.026	0.038	249003 1508	49,50
1.5	1.8	65	15.0	1.44	4	0.026	0.038	249003 1515	59,-
1.5	1.8	65	20.0	1.44	4	0.026	0.038	249003 1520	59,-
2.0	2.0	55	10.0	1.92	4	0.033	0.048	249003 2010	49,50
2.0	2.0	65	20.0	1.92	4	0.033	0.048	249003 2020	59,-
2.5	2.5	55	12.0	2.40	4	0.040	0.058	249003 2512	49,50
2.5	2.5	65	20.0	2.40	4	0.040	0.058	249003 2520	59,-

2149

## ATORN® High-performance milling tools Ultra-N

INFO

### Tool geometry

An optimal cutting-, micro- and chip-space geometry is particularly crucial in aluminium machining. Based on numerous machining tests, the geometries have been revised and adapted perfectly to the requirements of aluminium machining:

- maximum core diameter for high stability
- special cutting geometry to reduce cutting pressure
- optimal chip-space geometry for process-reliable chip removal
- Increased service life thanks to µm-precise cutting-edge rounding

### Wear-resistant carbide metal

The basic substrate consists of H10F fine-grade solid carbide for aluminium with a grain size of 0.6 - 0.8 µm. This substrate is especially wear-resistant, hard and resistant to pressure.

It can best withstand the dynamic and mechanical loads to be encountered. This is particularly important in the event of vibrations, which can easily lead to chinking on the cutting edge.



### Defined cutting-edge rounding

The basic aim of a cutting-edge rounding is to increase the service life of the tool and of the cutting edge. In the cutting tool grinding process, the cutting edge loses its definition due to micro-fractures (chinking). Through a defined honing, a process environment can be achieved at an early stage; that is, grinding-related points are removed and the risk of comb cracks minimised.

Conventional methods for the cutting edge rounding had the disadvantage that they were unable to create a reproducible and even honing of the cutting edge. The new technology allows optimum process control and reproducibility. With it, a uniform, µm-precise honing of the cutting edge and face can be achieved. This has a positive effect on the quality and service life of the tools and significantly improves your workpiece surfaces.

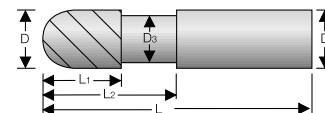
### Improved tolerances

Precision produces quality: one reason why this new generation of tools is manufactured to tighter tolerances. Basically, all shanks are made in h5 quality and all cutting edges in g7 quality.

# ATORN® Ultra-N radius milling cutter



- With clearance
- With defined cutting edge rounding
- For non-ferrous materials
- Radius tolerance +/- 0.01 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	180-420	< 55 HRc	< 60 HRc	≥ 60 HRc		
												●	●	●					

400-550 180-320 180-420

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	6	50	16	2.9	3	0.021	0.030	249240 0030	38,70
4.0	7	54	17	3.8	4	0.023	0.033	249240 0040	45,80
5.0	8	54	18	4.8	5	0.026	0.038	249240 0050	49,90
6.0	10	54	21	5.7	6	0.030	0.043	249240 0060	49,90
8.0	12	60	27	7.7	8	0.042	0.060	249240 0080	65,10
10.0	13	67	32	9.6	10	0.053	0.075	249240 0100	85,50
12.0	16	73	38	11.6	12	0.060	0.085	249240 0120	116,-
16.0	20	83	44	15.5	16	0.077	0.110	249240 0160	183,50

2149



## Long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	10	75	32	2.9	3	0.027	0.030	249250 0030	56,-
4.0	13	75	36	3.8	4	0.029	0.033	249250 0040	65,10
5.0	15	75	40	4.8	5	0.034	0.038	249250 0050	75,30
6.0	16	100	44	5.7	6	0.038	0.043	249250 0060	68,20
8.0	22	100	54	7.7	8	0.054	0.060	249250 0080	96,70
10.0	25	100	60	9.6	10	0.068	0.075	249250 0100	128,50
12.0	26	100	60	11.6	12	0.077	0.085	249250 0120	167,-
16.0	30	150	92	15.5	16	0.099	0.110	249250 0160	255,-

2149



## Extra-long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	10	125	82	2.8	3	0.024	0.030	249260 0030	96,70
4.0	13	125	86	3.75	4	0.026	0.033	249260 0040	108,-
5.0	15	150	90	4.8	5	0.030	0.038	249260 0050	127,50
6.0	16	150	94	5.6	6	0.034	0.043	249260 0060	140,50
8.0	22	150	104	7.6	8	0.048	0.060	249260 0080	181,50
10.0	25	150	110	9.6	10	0.060	0.075	249260 0100	203,-
12.0	26	150	110	11.4	12	0.068	0.085	249260 0120	234,-

2149



**Carbon high-performance thin-layer coating**

for machining CFRP, GFRP, aluminium, copper, graphite, ceramic, wood and sandwich materials, for forming materials with an adhesive tendency (e.g. aluminium)



**Hardness 6000 HV**

**Coating properties**

Material	amorphous, hydrogen-free carbon layer
Micro hardness	> 5000 HVpl 20 mN; standard: 6000-7500 HVpl 20 mN
Application temperature	max. 550°C
Colour	rainbow colours, up to anthracite

**Advantages**

- Good sliding properties and high layer hardness (approx. 60-80 % the hardness of diamond)
- Extremely durable and low-friction (wear protection coating for lubricated and non-lubricated inserts)
- Good milling and cutting quality
- No rounding of sharp-edged tools
- Coating performed at < 250°C. Even temperature-sensitive substrates can be coated.



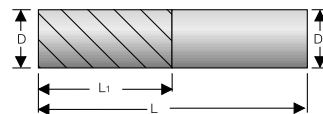
Range overview	Z	Ultra-N PRO range	Standard	Short	Long	Extra-long	HA	HB	Ø range mm	Page
Solid carbide, single cutting edge end milling cutter	1		●				●		Ø 1-12	517
Solid carbide drill groove cutter	2		●				●	●	Ø 3-20	517
Solid carbide end milling cutter	3		●			●	●	●	Ø 4-20	518
Solid carbide end milling cutter HPC	3						●	●	Ø 3-20	519
Solid carbide end milling cutter HPC	4		●				●	●	Ø 3-20	520
Solid carbide torus cutter	2		●		●		●		Ø 3-16	521
Solid carbide torus cutter	3		●				●		Ø 6-20	522
Solid carbide radius milling cutter	2		●				●		Ø 3-16	522
Solid carbide roughing cutter	3		●				●	●	Ø 6-20	523
Solid carbide trochoidal milling cutter	3				●		●	●	Ø 6-20	524

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●						
		Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

## ATORN® Single-blade milling cutter Ultra-N PRO



- **1 cutting edge, sharp**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- Spiral angle 30°
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●						
													440	400						

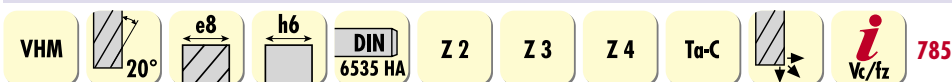
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
1.0	4	50	3.0	0.004	249005 0010	32,40
1.5	6	50	3.0	0.004	249005 0015	32,80
2.0	8	50	3.0	0.008	249005 0020	34,50
3.0	12	50	3.0	0.008	249005 0030	36,30
4.0	15	60	4.0	0.015	249005 0040	40,50
5.0	17	60	5.0	0.015	249005 0050	47,-
6.0	20	65	6.0	0.025	249005 0060	49,60
8.0	22	65	8.0	0.03	249005 0080	69,30
10.0	25	75	10.0	0.04	249005 0100	102,50
12.0	30	80	12.0	0.05	249005 0120	142,-

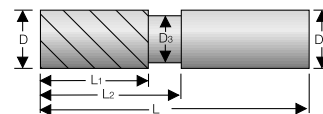


2169

## ATORN® Drill groove milling cutter 20° Ultra-N PRO



- **With clearance**
- **Spiral angle 20°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●						
													440	400						

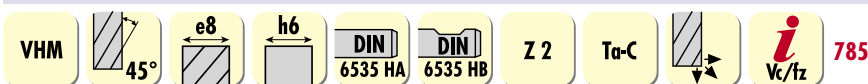
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Z	Feed fz aluminium ≥ 8 % Si mm/tooth	Feed fz aluminium ≥ 8 % Si mm/tooth	art.no.	€
3.0	11	50	14	2.9	6.0	2	0.008	0.01	249006 0030	53,80
4.0	13	54	16	3.9	6.0	2	0.015	0.025	249006 0040	58,80
5.0	15	54	18	4.9	6.0	2	0.015	0.025	249006 0050	63,10
6.0	16	64	21	5.8	6.0	2	0.025	0.04	249006 0060	68,90
8.0	22	70	27	7.8	8.0	2	0.03	0.05	249006 0080	76,30
10.0	25	72	32	9.7	10.0	2	0.04	0.065	249006 0100	107,-
12.0	28	83	38	11.7	12.0	3	0.05	0.09	249006 0120	134,50
16.0	36	92	44	15.7	16.0	3	0.065	0.12	249006 0160	226,-
20.0	41	104	54	19.5	20.0	4	0.085	0.15	249006 0200	370,-



2169

## ATORN® Drill groove milling cutter 45° Ultra-N PRO



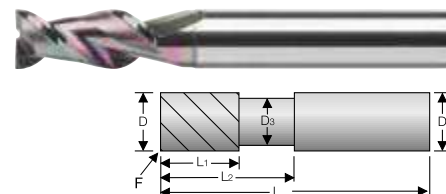
- With clearance
- 2 cutting edges, with edge chamfer
- Spiral angle 45°
- For non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●						
													440	400						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

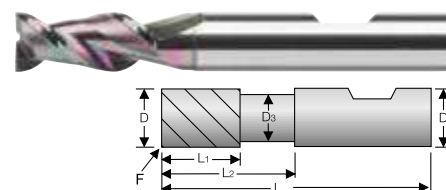
### Shank version HA

D	L1	L	L2	D3	D1	F x 45°	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	8	57	18	2.9	6.0	0.1	0.010	0.008	249007 0030	43,80
4.0	11	57	18	3.9	6.0	0.1	0.025	0.015	249007 0040	43,80
5.0	11	57	20	4.9	6.0	0.1	0.032	0.020	249007 0050	43,80
6.0	13	57	20	5.8	6.0	0.1	0.040	0.025	249007 0060	43,80
8.0	19	63	26	7.8	8.0	0.1	0.050	0.030	249007 0080	49,80
10.0	22	72	29	9.7	10.0	0.2	0.065	0.040	249007 0100	68,90
12.0	26	83	36	11.7	12.0	0.2	0.090	0.050	249007 0120	107,-



### Shank version HB

D	L1	L	L2	D3	D1	F x 45°	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16.0	32	92	42	15.7	16.0	0.2	0.12	0.065	249007 0160	168,50
20.0	38	104	52	19.5	20.0	0.2	0.15	0.080	249007 0200	243,-



2169

2169

## ATORN® End milling cutter Ultra-N PRO



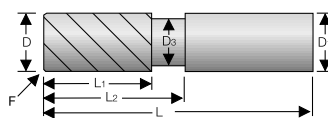
- With clearance
- 3 cutting edges, with edge chamfer
- Irregular spiral angle 43° / 47°
- For non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●						
													270	180						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

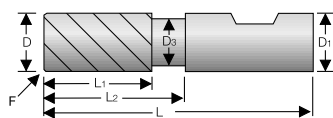
### Shank version HA

D	L1	L	L2	D3	D1	F x 45°	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	Without internal cooling art.no.	€	With internal cooling art.no.	€
4.0	6.5	80	24	3.9	6.0	0.1	0.02	0.015	249008 0040	48,50		
5.0	8.0	80	30	4.9	6.0	0.1	0.02	0.025	249008 0050	48,50		
6.0	10.0	80	42	5.8	6.0	0.2	0.03	0.025	249008 0060	48,50	249009 0060	93,60
8.0	13.0	100	62	7.8	8.0	0.2	0.04	0.03	249008 0080	67,-	249009 0080	114,-
10.0	16.0	100	58	9.7	10.0	0.2	0.05	0.04	249008 0100	90,10	249009 0100	134,50
12.0	19.0	120	73	11.7	12.0	0.2	0.07	0.05	249008 0120	133,-	249009 0120	171,-



2169

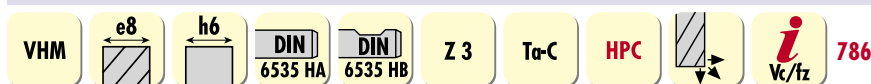
2169



**Shank version HB**

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	Without internal cooling art.no.	€	With internal cooling art.no.	€
16.0	25	150	92	15.7	16.0	0.2	0.09	0.065	249008 0160	249,-	249009 0160	275,-
20.0	32	150	100	19.5	20.0	0.2	0.12	0.085	249008 0200	355,-	249009 0200	380,-
									2169		2169	

**ATORN® End milling cutter HPC Ultra-N PRO**



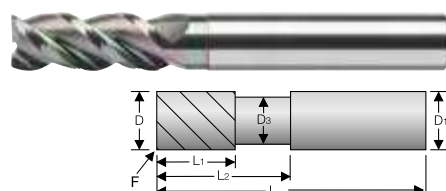
- With clearance
- 3 cutting edges, with edge chamfer
- Irregular spiral angle 43° / 47°
- For non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													● 270	● 180						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

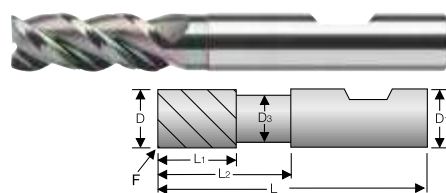
**Shank version HA**

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	12	57	16	2.9	6.0	0.1	0.020	0.015	249010 0030	41,70
4.0	12	57	18	3.9	6.0	0.1	0.025	0.020	249010 0040	41,70
5.0	15	57	18	4.9	6.0	0.1	0.030	0.025	249010 0050	41,70
6.0	15	57	21	5.8	6.0	0.1	0.040	0.030	249010 0060	41,70
8.0	22	64	28	7.8	8.0	0.1	0.050	0.040	249010 0080	48,80
10.0	25	73	33	9.7	10.0	0.2	0.070	0.050	249010 0100	73,30
12.0	28	84	39	11.7	12.0	0.2	0.015	0.010	249010 0120	102,-
2169										



**Shank version HB**

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16.0	35	93	45	15.7	16.0	0.2	0.090	0.065	249010 0160	146,50
20.0	41	104	52	19.5	20.0	0.2	0.120	0.085	249010 0200	265,-
2169										





## ATORN® End milling cutter HPC Ultra-N PRO



- With clearance
- 4 cutting edges, with edge chamfer
- Irregular spiral angle 43° / 47°
- For non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

material	● very well suited	steel			stainless steel		cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																	

### Shank version HA

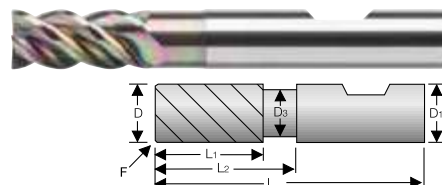
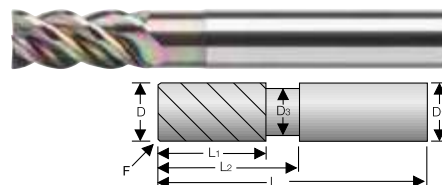
D	L1	L	L2	D3	D1	F x 45°	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	6	57	10	2.9	6.0	0.1	0.015	0.010	249011 0030	49,-
4.0	8	57	14	3.9	6.0	0.1	0.20	0.015	249011 0040	49,-
5.0	10	57	16	4.9	6.0	0.1	0.025	0.020	249011 0050	49,-
6.0	12	57	19	5.8	6.0	0.2	0.030	0.025	249011 0060	49,-
8.0	16	63	25	7.8	8.0	0.2	0.040	0.030	249011 0080	59,60
10.0	20	72	30	9.7	10.0	0.2	0.050	0.040	249011 0100	102,-
12.0	24	83	36	11.7	12.0	0.2	0.070	0.050	249011 0120	137,50

2169

### Shank version HB

D	L1	L	L2	D3	D1	F x 45°	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16.0	32	92	42	15.7	16.0	0.2	0.090	0.065	249011 0160	256,-
20.0	40	104	52	19.5	20.0	0.2	0.120	0.085	249011 0200	375,-

2169



Freddy®

# Chip vacuum cleaner

For removing ultra-fine particles up to 10 µm

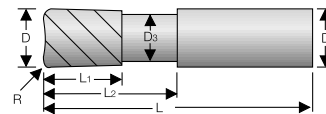
- Removes ultra-fine particles up to 10 µm
- Filtering and cleaning of emulsions
- Especially suited for aluminium machining



# ATORN® Torus milling cutter Ultra-N PRO



- With clearance
- 2 cutting edges
- Spiral angle 45°
- For non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal



material	● very well suited	steel			stainless steel		cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
249013....												●	●					
249012....												●	●					

300 230  
160 120

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D	L1	L	L2	D3	D1	R	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	aluminium < 8 % Si	aluminium < 8 % Si		
							mm/tooth	mm/tooth		
3.0	4	50	14	2.9	6.0	0.3	0.01	0.011	<b>249013 0303</b>	<b>44,20</b>
4.0	5	50	16	3.9	6.0	0.3	0.02	0.023	249013 0403	50,60
5.0	6	54	18	4.9	6.0	0.3	0.02	0.023	249013 0503	54,70
6.0	7	57	21	5.8	6.0	0.3	0.03	0.034	249013 0603	60,70
6.0	7	57	21	5.8	6.0	1.0	0.03	0.034	249013 0610	60,70
6.0	7	57	21	5.8	6.0	2.0	0.03	0.034	249013 0620	60,70
8.0	9	63	27	7.8	8.0	0.3	0.04	0.045	249013 0803	81,20
8.0	9	63	27	7.8	8.0	1.0	0.04	0.045	249013 0810	81,20
8.0	9	63	27	7.8	8.0	2.0	0.04	0.045	249013 0820	81,20
10.0	11	72	32	9.7	10.0	0.3	0.05	0.056	249013 1003	107,50
10.0	11	72	32	9.7	10.0	1.5	0.05	0.056	249013 1015	107,50
10.0	11	72	32	9.7	10.0	3.0	0.05	0.056	249013 1030	107,50
12.0	13	83	38	11.7	12.0	1.5	0.07	0.079	249013 1215	144,50
12.0	13	83	38	11.7	12.0	4.0	0.07	0.079	249013 1240	144,50
16.0	17	92	44	15.7	16.0	2.0	0.09	0.1	249013 1620	235,-
16.0	17	92	44	15.7	16.0	5.0	0.09	0.1	249013 1650	235,-

2169



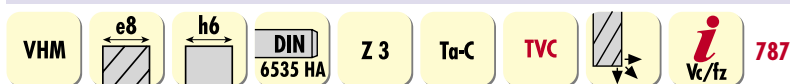
## Long

D	L1	L	L2	D3	D1	R	Feed fz	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	aluminium < 8 % Si	aluminium < 8 % Si		
							mm/tooth	mm/tooth		
3.0	4	75	32	2.9	6.0	0.3	0.01	0.011	<b>249012 0303</b>	<b>60,70</b>
4.0	5	75	36	3.9	6.0	0.3	0.02	0.023	249012 0403	66,80
5.0	6	75	40	4.9	6.0	0.3	0.02	0.023	249012 0503	73,80
6.0	7	80	44	5.8	6.0	0.3	0.03	0.034	249012 0603	79,60
6.0	7	80	44	5.8	6.0	1.0	0.03	0.034	249012 0610	79,60
6.0	7	80	44	5.8	6.0	2.0	0.03	0.034	249012 0620	79,60
8.0	9	100	54	7.8	8.0	0.3	0.04	0.045	249012 0803	112,-
8.0	9	100	54	7.8	8.0	1.0	0.04	0.045	249012 0810	112,-
8.0	9	100	54	7.8	8.0	2.0	0.04	0.045	249012 0820	112,-
10.0	11	100	60	9.7	10.0	0.3	0.05	0.056	249012 1003	151,50
10.0	11	100	60	9.7	10.0	1.5	0.05	0.056	249012 1015	151,50
10.0	11	100	60	9.7	10.0	3.0	0.05	0.056	249012 1030	151,50
12.0	13	120	75	11.7	12.0	1.5	0.07	0.079	249012 1215	201,-
12.0	13	120	75	11.7	12.0	4.0	0.07	0.079	249012 1240	201,-
16.0	17	150	92	15.7	16.0	2.0	0.09	0.1	249012 1620	340,-
16.0	17	150	92	15.7	16.0	5.0	0.09	0.1	249012 1650	340,-

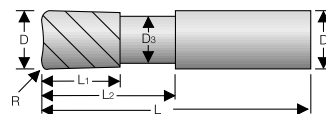
2169



## ATORN® Torus milling cutter Ultra-N PRO



- with clearance
- 3 cutting edges
- unequal spiral angle 43° / 47°
- for non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- with polish grinding in the chip chambers
- large chip space for unhindered chip removal
- chip separator



material	● very well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	alloys	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●						
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																				

D	L1	L	L2	D3	D1	R	Feed fz	aluminium < 8 % Si	art.no.	€
mm	mm	mm	mm	mm	mm	mm	mm/tooth	mm/tooth		
6.0	25	71	31	5.8	6.0	0.5	0.032		249014 0605	61,90
6.0	25	71	31	5.8	6.0	1.0	0.032		249014 0610	61,90
8.0	33	80	41	7.8	8.0	0.5	0.045		249014 0805	73,40
8.0	33	80	41	7.8	8.0	1.0	0.045		249014 0810	73,40
8.0	33	80	41	7.8	8.0	2.0	0.045		249014 0820	73,40
10.0	41	95	51	9.7	10.0	0.5	0.055		249014 1005	105,50
10.0	41	95	51	9.7	10.0	1.0	0.055		249014 1010	105,50
10.0	41	95	51	9.7	10.0	2.0	0.055		249014 1020	105,50
12.0	49	109	61	11.7	12.0	0.5	0.08		249014 1205	143,50
12.0	49	109	61	11.7	12.0	1.0	0.08		249014 1210	143,50
12.0	49	109	61	11.7	12.0	2.0	0.08		249014 1220	143,50
16.0	65	132	81	15.7	16.0	2.0	0.095		249014 1620	265,-
16.0	65	132	81	15.7	16.0	3.0	0.095		249014 1630	265,-
20.0	82	154	101	19.5	20.0	2.0	0.125		249014 2020	390,-
20.0	82	154	101	19.5	20.0	3.0	0.125		249014 2030	390,-

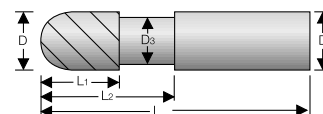


2169

## ATORN® Radius milling cutter Ultra-N PRO



- With clearance
- 2 cutting edges
- Spiral angle 45°
- For non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal



material	● very well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	alloys	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
249015....													●	●						
249016....													●	●						
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																				

### Short

D	L1	L	L2	D3	D1	Feed fz	aluminium < 8 % Si	art.no.	€
mm	mm	mm	mm	mm	mm	mm/tooth	mm/tooth		
3.0	6	50	16	2.9	3.0	0.03		249015 0030	44,20
4.0	7	54	17	3.9	4.0	0.03		249015 0040	52,-
5.0	8	54	18	4.9	5.0	0.06		249015 0050	59,20
6.0	10	54	21	5.8	6.0	0.06		249015 0060	59,20
8.0	12	59	27	7.8	8.0	0.06		249015 0080	72,20
10.0	13	67	32	9.8	10.0	0.08		249015 0100	95,50
12.0	16	73	38	11.7	12.0	0.08		249015 0120	123,-
16.0	20	83	44	16.7	16.0	0.15		249015 0160	204,-



2169

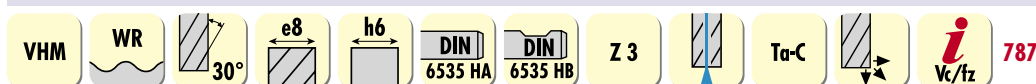
Long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	10	75	32	2.9	3.0	0.03	249016 0030	61,70
4.0	13	75	36	3.9	4.0	0.03	249016 0040	72,80
5.0	15	75	40	4.9	5.0	0.06	249016 0050	79,40
6.0	16	100	44	5.8	6.0	0.06	249016 0060	79,40
8.0	22	100	54	7.8	8.0	0.06	249016 0080	107,-
10.0	25	100	60	7.8	10.0	0.08	249016 0100	140,50
12.0	26	100	60	11.7	12.0	0.08	249016 0120	184,-
16.0	30	150	92	15.7	16.0	0.15	249016 0160	291,-

2169



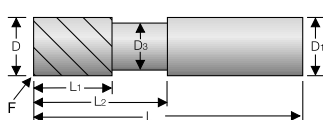
ATORN® Roughing cutter Ultra-N PRO



- With clearance
- 3 cutting edges, with edge chamfer
- Spiral angle 30°
- For non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●						
													320	260						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

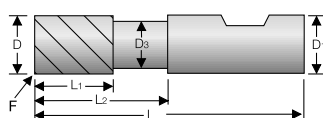


Shank version HA

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	Without internal cooling art.no.	€	With internal cooling art.no.	€
6.0	14	57	20	5.9	6.0	0.2	0.08	0.06	249017 0060	46,60	249018 0060	75,40
8.0	21	63	26	7.8	8.0	0.25	0.08	0.06	249017 0080	58,60	249018 0080	81,80
10.0	23	72	31	9.8	10.0	0.3	0.09	0.07	249017 0100	70,90	249018 0100	109,50
12.0	27	83	37	11.7	12.0	0.35	0.09	0.07	249017 0120	93,70	249018 0120	163,50

2169

2169



Shank version HB

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	Without internal cooling art.no.	€	With internal cooling art.no.	€
16.0	36	92	43	15.7	16.0	0.4	0.11	0.09	249017 0160	153,50	249018 0160	233,-
20.0	41	104	52	19.5	20.0	0.4	0.14	0.12	249017 0200	227,-	249018 0200	328,-

2169

2169

# ATORN® Trochoidal milling cutter Ultra-N PRO

VHM 30° e8 h6 DIN 6535 HA DIN 6535 HB Z 3 Ta-C TVC Vc/fz **787**

- 3 cutting edges, with edge chamfer
- Spiral angle 30°
- 3.5 x D
- For non-ferrous materials
- Cutting material: solid carbide with DLC-sp3 coating
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

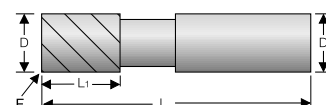
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●						
													270	180						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Shank version HA

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	21	62	6.0	0.2	0.036	249019 0060	57,60
8.0	28	68	8.0	0.2	0.048	249019 0080	68,90
10.0	35	80	10.0	0.2	0.06	249019 0100	100,50
12.0	42	93	12.0	0.2	0.084	249019 0120	136,-

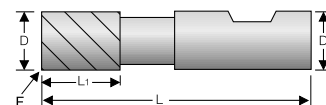
2169



## Shank version HB

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16.0	56	108	16.0	0.2	0.108	249019 0160	252,-
20.0	70	126	20.0	0.2	0.144	249019 0200	365,-

2169



**ATORN® High-speed milling cutters for stainless steel and special alloys****INFO**

The new generation of ATORN milling cutters are characterised by excellent performance in the machining of stainless steel and special alloys containing metals such as nickel, cobalt and titanium. An ultra-fine-grain carbide metal substrate in combination with high-performance geometry and specially developed ULTRA-MS coating make these tools absolutely process-safe and wear-resistant and allow a high metal removal rate.

The new geometries – i.e., adapted core diameters, optimal and positive rake and helix angles and corresponding microgeometries – allow for high feed rates and deliveries. One example of this are the 4-edge HPC milling cutters. These are designed with unequal flute spacing and unequal helix pitch. This design not only makes the tools suitable for use in **HPC milling**, but allows trouble-free **trochoidal milling** as well.

The range includes HSC- and HPC-enabled tools for roughing, semi-roughing and finishing from  $\varnothing$  0.2-20 mm. The excellent stability during machining leads to process safety and high-quality surfaces, which cuts costs and boosts efficiency.

The mini-end milling cutters, also available as torus and radius milling cutters, round out the range.

**ATORN®**

High quality for great performance

**Extreme temperature resistance thanks to ULTRA-MS**

The special ULTRA-MS coating can handle application temperatures of up to 1100 ° C. That's important, because these special alloys are poor heat dissipaters.

**Maximum service life**

The ULTRA-MS coating significantly increases the service life of the tools.

**Perfect cutting edge geometry makes for quiet running**

Perfectly matched to the machining conditions in stainless steel and special alloys:

positive cutting geometries ensure soft cuts and smooth running

**Low vibrations, even in border areas**

The unequal helix pitch and unequal flute spacing reduce vibrations during machining

**High precision**

For precise components, high-precision edge radii, among other things, with a tolerance of less than 0.01 mm, ensure

**The highest surface quality**

The multitude of special features guarantees the highest quality surface finishes with no chatter marks, and much more.

Overview of the range				Ø-area mm		Page												
Solid carbide mini end milling cutters				Ø 0.5 - 4		526												
Solid carbide mini torus cutters				Ø 0.5 - 4		530												
Solid carbide mini radius milling cutters				Ø 0.5 - 4		532												
Solid carbide end milling cutters for stainless steel				Ø 4 - 20		527												
Solid carbide end milling cutters for titanium materials				Ø 3 - 25		528												
Solid carbide torus cutters				Ø 4 - 20		531												
Solid carbide radius milling cutters, standard				Ø 3 - 20		533												
material	● very well suited	steel		stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○	●	●	●	○	○	●	●							



# ATORN® Ultra-MS mini end milling cutter

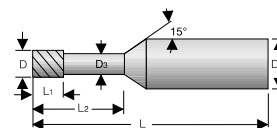
VHM
NH

e8
h6

Z 2
AlCrN

Vc/fz
789

• With clearance



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	G6/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 96-112	● 96-112	○ 96-112	● 60-80	● 60-80	● 60-80	○ 96-112	○ 96-112	● 60-80	● 60-80	● 60-80								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz stainless steel austenitic mm/tooth	art.no.	€
0.5	0.7	2.0	50	0.45	4	0.001	<b>256011 0011</b>	<b>40,90</b>
0.5	0.7	4.0	50	0.45	4	0.001	256011 0012	<b>40,90</b>
0.5	0.7	6.0	50	0.45	4	0.001	256011 0013	<b>40,90</b>
0.5	0.7	8.0	50	0.45	4	0.001	256011 0014	<b>40,90</b>
0.8	1.2	4.0	50	0.75	4	0.003	256011 0020	<b>38,90</b>
0.8	1.2	6.0	50	0.75	4	0.003	256011 0021	<b>38,90</b>
0.8	1.2	8.0	50	0.75	4	0.003	256011 0022	<b>38,90</b>
0.8	1.2	10.0	50	0.75	4	0.003	256011 0023	<b>38,90</b>
0.8	1.2	12.0	50	0.75	4	0.003	256011 0024	<b>38,90</b>
1.0	1.5	6.0	50	0.95	4	0.004	256011 0025	<b>28,30</b>
1.0	1.5	8.0	50	0.95	4	0.004	256011 0026	<b>28,30</b>
1.0	1.5	10.0	50	0.95	4	0.004	256011 0027	<b>28,30</b>
1.0	1.5	12.0	50	0.95	4	0.004	256011 0028	<b>29,30</b>
1.0	1.5	16.0	50	0.95	4	0.004	256011 0029	<b>29,30</b>
1.2	1.8	6.0	50	1.15	4	0.005	256011 0030	<b>29,30</b>
1.2	1.8	8.0	50	1.15	4	0.005	256011 0031	<b>29,30</b>
1.2	1.8	10.0	50	1.15	4	0.005	256011 0032	<b>30,80</b>
1.2	1.8	12.0	50	1.15	4	0.005	256011 0033	<b>30,80</b>
1.5	2.3	6.0	50	1.45	4	0.006	256011 0034	<b>29,30</b>
1.5	2.3	8.0	50	1.45	4	0.006	256011 0035	<b>29,30</b>
1.5	2.3	10.0	50	1.45	4	0.006	256011 0036	<b>29,30</b>
1.5	2.3	12.0	50	1.45	4	0.006	256011 0037	<b>30,80</b>
1.5	2.3	16.0	50	1.45	4	0.006	256011 0038	<b>30,80</b>
1.5	2.3	20.0	60	1.45	4	0.006	256011 0039	<b>30,80</b>
2.0	3	6.0	50	1.95	4	0.008	256011 0040	<b>29,30</b>
2.0	3	8.0	50	1.95	4	0.008	256011 0041	<b>29,30</b>
2.0	3	10.0	50	1.95	4	0.008	256011 0042	<b>29,30</b>
2.0	3	12.0	50	1.95	4	0.008	256011 0043	<b>29,30</b>
2.0	3	16.0	50	1.95	4	0.008	256011 0044	<b>30,80</b>
2.0	3	20.0	60	1.95	4	0.008	256011 0045	<b>31,80</b>
2.0	3	25.0	75	1.95	4	0.008	256011 0046	<b>32,60</b>
2.5	3.7	8.0	50	2.40	4	0.010	256011 0048	<b>29,30</b>
2.5	3.7	10.0	50	2.40	4	0.010	256011 0049	<b>29,30</b>
2.5	3.7	12.0	50	2.40	4	0.010	256011 0050	<b>29,30</b>
2.5	3.7	16.0	50	2.40	4	0.010	256011 0051	<b>30,80</b>
2.5	3.7	20.0	60	2.40	4	0.010	256011 0052	<b>33,-</b>
2.5	3.7	25.0	60	2.40	4	0.010	256011 0053	<b>33,60</b>
3.0	4.5	8.0	50	2.85	6	0.012	256011 0055	<b>40,90</b>
3.0	4.5	10.0	50	2.85	6	0.012	256011 0056	<b>40,90</b>
3.0	4.5	12.0	50	2.85	6	0.012	256011 0057	<b>40,90</b>
3.0	4.5	16.0	60	2.85	6	0.012	256011 0058	<b>40,90</b>
3.0	4.5	20.0	60	2.85	6	0.012	256011 0059	<b>42,20</b>
3.0	4.5	25.0	75	2.85	6	0.012	256011 0060	<b>43,40</b>
4.0	4.5	20.0	60	3.85	6	0.016	256011 0063	<b>42,20</b>
4.0	4.5	25.0	75	3.85	6	0.016	256011 0064	<b>43,40</b>
4.0	4.5	30.0	75	3.85	6	0.016	256011 0065	<b>43,40</b>
4.0	4.5	40.0	75	3.85	6	0.016	256011 0066	<b>43,40</b>

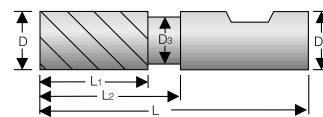
2153

### HPMT End milling cutters

VHM           **763**

- With clearance
- Irregular pitch to minimise vibrations
- CNC repetition precision to within 10 µm
- For milling stainless steel, machining exotic materials, and general applications
- Especially suitable for groove milling and lateral machining

**EXCLUSIVE item:  
The all-rounder!**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		150-200	100-120	70-90	40-70	40-70	50-60			60-70	15-25	15-20	280-350	200-250	150-200					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	D1 mm	L mm	D3 mm	Feed fz		art.no.	€
						steel < 1000 N/mm <sup>2</sup> mm/tooth	steel < 1000 N/mm <sup>2</sup> mm/tooth		
3	9	15	6	57	2.80	0.016	0.020	254121 0030	26,90
4	12	20	6	57	3.70	0.021	0.026	254121 0040	26,90
5	13	20	6	57	4.60	0.026	0.032	254121 0050	26,90
6	13	20	6	57	5.50	0.031	0.038	254121 0060	26,90
8	20	30	8	64	7.40	0.037	0.046	254121 0080	37,90
10	22	32	10	72	9.20	0.044	0.054	254121 0100	56,50
12	26	37	12	83	11.00	0.050	0.062	254121 0120	72,90
16	32	46	16	92	15.00	0.063	0.078	254121 0160	127,50
20	38	58	20	104	19.00	0.075	0.094	254121 0200	205,-



2180

### ATORN® Ultra-MS end milling cutter

VHM NH           **789**

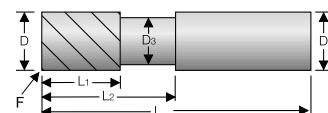
- With clearance

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		120-140	120-140	120-140	60-80	60-80	60-80	120-140	120-140	60-80	60-80	60-80								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

#### Standard

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Feed fz		DIN 6535-HA art.no.	€
							stainless steel mm/tooth	austenitic mm/tooth		
4	11	20	57	3.70	6	0.1	0.016	0.021	256008 0040	38,70
5	13	20	57	4.60	6	0.1	0.020	0.026	256008 0050	38,70
6	13	20	57	5.50	6	0.1	0.024	0.031	256008 0060	38,70
8	20	30	64	7.40	8	0.2	0.030	0.038	256008 0080	57,-
10	22	32	72	9.20	10	0.2	0.036	0.046	256008 0100	69,20
12	26	37	83	11.00	12	0.2	0.043	0.054	256008 0120	99,70
16	32	46	92	15.00	16	0.3	0.054	0.068	256008 0160	165,-
20	38	58	104	19.00	20	0.4	0.066	0.083	256008 0200	254,-



2153

#### Standard end milling cutter set

Contents		art.no.	€
End milling cutter set, solid carbide 35°/38°, irreg. pitch, Ø6, 8, 10, 12 mm, clear. (stainless steel) 4 S., HA, Ultra-MS		256008 1004	255,-

2153

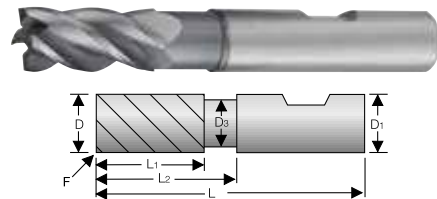


Continued on next page >>>

Standard with driving plane

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Feed fz		DIN 6535-HB art.no.	€
							stainless steel mm/tooth	austenitic mm/tooth		
4	11	20	57	3.70	6	0.1	0.016	0.021	256007 0040	38,70
5	13	20	57	4.60	6	0.1	0.020	0.026	256007 0050	38,70
6	13	20	57	5.50	6	0.1	0.024	0.031	256007 0060	38,70
8	20	30	64	7.40	8	0.2	0.030	0.038	256007 0080	57,-
10	22	32	72	9.20	10	0.2	0.036	0.046	256007 0100	69,20
12	26	37	83	11.00	12	0.2	0.043	0.054	256007 0120	99,70
16	32	46	92	15.00	16	0.3	0.054	0.068	256007 0160	165,-
20	38	58	104	19.00	20	0.4	0.066	0.083	256007 0200	254,-

2153



Standard end milling cutter set with driving plane

Contents		art.no.	€
End milling cutter set, solid carbide 35°/38°, irreg. pitch, Ø6, 8, 10, 12 mm, clear. (stainless steel) 4 S., HB, Ultra-MS		256007 1004	255,-

2153



VAN HOORN CARBIDE VHVTR/W 4/5 end milling cutter

VHM Z 4 Z 5 TiAlSiN 768

- Cutting material: ultra-fine grain solid carbide, TiAlSiN-coated
- Special pre-treatment and finishing treatment due to micro radiation
- New chip flute geometry for enhanced cooling and chip flow
- For wet machining, high material removal rate

For machining titanium and stainless steel

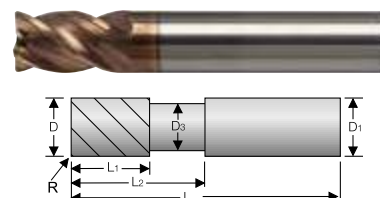
material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
					●	●	●			●	●							
					80-150	60-120	40-100			70-100	30-50	20-30						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Short Z4

D mm	R mm	D3 mm	D1 mm	L mm	L1 mm	Z	L2 mm	Feed fz		DIN 6535-HB art.no.	€
								stainless steel mm/tooth	ferrit./martens. mm/tooth		
3.0	0.2	2.8	6.0	51	5	4	7	0.015	0.020	255088 0030	38,40
4.0	0.2	3.8	6.0	51	6	4	9	0.025	0.030	255088 0040	42,10
5.0	0.2	4.6	6.0	51	7	4	11	0.025	0.030	255088 0050	45,40
6.0	0.3	5.6	6.0	64	8	4	13	0.030	0.040	255088 0060	49,50
8.0	0.5	7.4	8.0	64	11	4	18	0.040	0.050	255088 0080	65,10
10.0	0.5	9.4	10.0	70	13	4	22	0.055	0.070	255088 0100	85,50
12.0	1.0	11.4	12.0	78	15	4	25	0.065	0.080	255088 0120	121,50
16.0	1.0	15.4	16.0	89	19	4	35	0.080	0.100	255088 0160	174,-
20.0	1.0	19.2	20.0	102	23	4	42	0.010	0.200	255088 0200	285,-
25.0	1.0	24.2	25.0	120	28	4	45	0.125	0.250	255088 0250	395,-

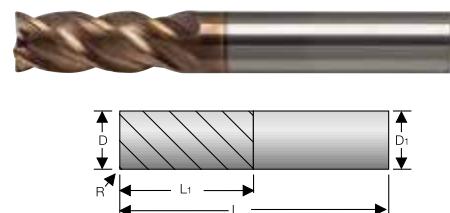
2113



Standard Z4

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz		DIN 6535-HA art.no.	€
						stainless steel mm/tooth	ferrit./martens. mm/tooth		
4.0	0.2	6.0	51	9	4	0.025	0.030	255087 0040	43,90
5.0	0.2	6.0	51	11	4	0.025	0.030	255087 0050	47,40
6.0	0.3	6.0	64	13	4	0.030	0.040	255087 0060	51,40
8.0	0.5	8.0	64	18	4	0.040	0.050	255087 0080	67,70
10.0	0.5	10.0	70	22	4	0.055	0.070	255087 0100	88,50
12.0	1.0	12.0	78	25	4	0.065	0.080	255087 0120	124,50
16.0	1.0	16.0	89	35	4	0.080	0.100	255087 0160	181,50
20.0	1.0	20.0	102	42	4	0.010	0.200	255087 0200	290,-
25.0	1.0	25.0	120	45	4	0.125	0.250	255087 0250	405,-

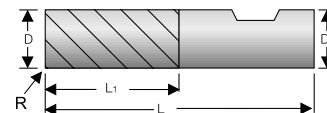
2113



**Standard with driving plane Z4**

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz stainless steel ferrit./martens. mm/tooth	Feed fz stainless steel ferrit./martens. mm/tooth	DIN 6535-HB art.no.	€
6.0	0.3	6.0	64	13	4	0.030	0.040	255084 0060	51,40
8.0	0.5	8.0	64	18	4	0.040	0.050	255084 0080	67,70
10.0	0.5	10.0	70	22	4	0.055	0.070	255084 0100	88,50
12.0	1.0	12.0	78	25	4	0.065	0.080	255084 0120	124,50
16.0	1.0	16.0	89	35	4	0.080	0.100	255084 0160	181,50
20.0	1.0	20.0	102	42	4	0.100	0.200	255084 0200	290,-
25.0	1.0	25.0	120	45	4	0.125	0.250	255084 0250	405,-

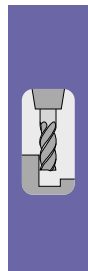
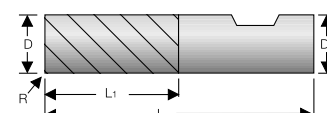
2113



**Standard with driving plane Z5**

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz stainless steel ferrit./martens. mm/tooth	DIN 6535-HB art.no.	€
3	0.2	6	51	7	5	0.01	255102 0302	40,-
4	0.2	6	51	9	5	0.012	255102 0402	43,90
5	0.2	6	51	11	5	0.02	255102 0502	47,40
6	0.1	6	64	13	5	0.025	255102 0601	51,40
6	0.3	6	64	13	5	0.025	255102 0603	51,40
6	0.5	6	64	13	5	0.025	255102 0605	51,40
6	1	6	64	13	5	0.025	255102 0610	51,40
8	0.1	8	64	18	5	0.035	255102 0801	67,70
8	0.3	8	64	18	5	0.035	255102 0803	67,70
8	0.5	8	64	18	5	0.035	255102 0805	67,70
8	1	8	64	18	5	0.035	255102 0810	67,70
10	0.1	10	70	22	5	0.04	255102 1001	88,50
10	0.3	10	70	22	5	0.04	255102 1003	88,50
10	0.5	10	70	22	5	0.04	255102 1005	88,50
10	1	10	70	22	5	0.04	255102 1010	88,50
12	0.1	12	78	25	5	0.05	255102 1201	124,50
12	0.3	12	78	25	5	0.05	255102 1203	124,50
12	0.5	12	78	25	5	0.05	255102 1205	124,50
12	1	12	78	25	5	0.05	255102 1210	124,50
14	0.5	14	89	30	5	0.055	255102 1405	184,50
14	1	14	89	30	5	0.055	255102 1410	184,50
16	0.1	16	89	35	5	0.06	255102 1601	181,50
16	0.5	16	89	35	5	0.06	255102 1605	181,50
16	1	16	89	35	5	0.06	255102 1610	181,50
20	0.5	20	102	42	5	0.08	255102 2005	290,-
20	1	20	102	42	5	0.08	255102 2010	290,-
25	0.5	25	120	45	5	0.11	255102 2505	405,-
25	1	25	120	45	5	0.11	255102 2510	405,-

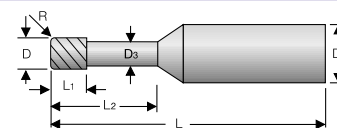
2113



# ATORN® Ultra-MS mini torus cutter

VHM
NH
40°
e8
h6
DIN 6535 HA
Z 2
AlCrN
3D PRINT
i Vc/fz 789

• With clearance



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○	●	●	●	○	○	●	●	●						
		96-112	96-112	96-112	60-80	60-80	60-80	96-112	96-112	60-80	60-80	60-80						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



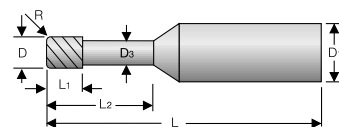
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz		art.no.	€
							stainless steel	austenitic mm/tooth		
0.5	0.7	2.0	50	0.45	4	0.05	0.001	0.002	<b>256012 0011</b>	<b>44,60</b>
0.5	0.7	4.0	50	0.45	4	0.05	0.001	0.002	256012 0012	<b>44,60</b>
0.5	0.7	6.0	50	0.45	4	0.05	0.001	0.002	256012 0013	<b>42,-</b>
0.5	0.7	8.0	50	0.45	4	0.05	0.001	0.002	256012 0014	<b>42,-</b>
0.8	1.2	4.0	50	0.75	4	0.10	0.003	0.004	256012 0018	<b>40,90</b>
0.8	1.2	6.0	50	0.75	4	0.10	0.003	0.004	256012 0019	<b>40,90</b>
0.8	1.2	8.0	50	0.75	4	0.10	0.003	0.004	256012 0020	<b>40,90</b>
0.8	1.2	10.0	50	0.75	4	0.10	0.003	0.004	256012 0021	<b>42,30</b>
0.8	1.2	12.0	50	0.75	4	0.10	0.003	0.004	256012 0022	<b>42,30</b>
1.0	1.5	6.0	50	0.95	4	0.10	0.004	0.005	256012 0023	<b>30,80</b>
1.0	1.5	8.0	50	0.95	4	0.10	0.004	0.005	256012 0024	<b>30,80</b>
1.0	1.5	10.0	50	0.95	4	0.10	0.004	0.005	256012 0025	<b>30,80</b>
1.0	1.5	12.0	50	0.95	4	0.10	0.004	0.005	256012 0026	<b>31,80</b>
1.0	1.5	16.0	50	0.95	4	0.10	0.004	0.005	256012 0027	<b>31,80</b>
1.2	1.8	6.0	50	1.15	4	0.10	0.005	0.006	256012 0028	<b>30,80</b>
1.2	1.8	8.0	50	1.15	4	0.10	0.005	0.006	256012 0029	<b>30,80</b>
1.2	1.8	10.0	50	1.15	4	0.10	0.005	0.006	256012 0030	<b>30,80</b>
1.2	1.8	12.0	50	1.15	4	0.10	0.005	0.006	256012 0031	<b>30,80</b>
1.5	2.3	6.0	50	1.45	4	0.20	0.006	0.007	256012 0032	<b>30,80</b>
1.5	2.3	8.0	50	1.45	4	0.20	0.006	0.007	256012 0033	<b>30,80</b>
1.5	2.3	10.0	50	1.45	4	0.20	0.006	0.007	256012 0034	<b>30,80</b>
1.5	2.3	12.0	50	1.45	4	0.20	0.006	0.007	256012 0035	<b>30,80</b>
1.5	2.3	16.0	50	1.45	4	0.20	0.006	0.007	256012 0036	<b>31,80</b>
1.5	2.3	20.0	60	1.45	4	0.20	0.006	0.007	256012 0037	<b>31,80</b>
2.0	3	6.0	50	1.95	4	0.20	0.008	0.010	256012 0038	<b>30,80</b>
2.0	3	8.0	50	1.95	4	0.20	0.008	0.010	256012 0039	<b>30,80</b>
2.0	3	10.0	50	1.95	4	0.20	0.008	0.010	256012 0040	<b>30,80</b>
2.0	3	12.0	50	1.95	4	0.20	0.008	0.010	256012 0041	<b>30,80</b>
2.0	3	16.0	50	1.95	4	0.20	0.008	0.010	256012 0042	<b>31,80</b>
2.0	3	20.0	60	1.95	4	0.20	0.008	0.010	256012 0043	<b>33,-</b>
2.0	3	25.0	75	1.95	4	0.20	0.008	0.010	256012 0044	<b>34,-</b>
2.5	3.7	8.0	50	2.40	4	0.30	0.010	0.013	256012 0046	<b>30,80</b>
2.5	3.7	10.0	50	2.40	4	0.30	0.010	0.013	256012 0047	<b>30,80</b>
2.5	3.7	12.0	50	2.40	4	0.30	0.010	0.013	256012 0048	<b>30,80</b>
2.5	3.7	16.0	50	2.40	4	0.30	0.010	0.013	256012 0049	<b>31,80</b>
2.5	3.7	20.0	60	2.40	4	0.30	0.010	0.013	256012 0050	<b>35,20</b>
2.5	3.7	25.0	60	2.40	4	0.30	0.010	0.013	256012 0051	<b>36,30</b>
3.0	4.5	8.0	50	2.85	6	0.30	0.012	0.015	256012 0053	<b>43,40</b>
3.0	4.5	10.0	50	2.85	6	0.30	0.012	0.015	256012 0054	<b>43,40</b>
3.0	4.5	12.0	50	2.85	6	0.30	0.012	0.015	256012 0055	<b>43,40</b>
3.0	4.5	16.0	60	2.85	6	0.30	0.012	0.015	256012 0056	<b>43,40</b>
3.0	4.5	20.0	60	2.85	6	0.30	0.012	0.015	256012 0057	<b>43,40</b>
3.0	4.5	25.0	75	2.85	6	0.30	0.012	0.015	256012 0058	<b>45,80</b>
4.0	4.5	20.0	60	3.85	6	0.40	0.016	0.021	256012 0061	<b>43,40</b>
4.0	4.5	25.0	75	3.85	6	0.40	0.016	0.021	256012 0062	<b>45,80</b>
4.0	4.5	30.0	75	3.85	6	0.40	0.016	0.021	256012 0063	<b>45,80</b>
4.0	4.5	40.0	75	3.85	6	0.40	0.016	0.021	256012 0064	<b>47,-</b>

2153

**ATORN® Ultra-MS torus cutter**

VHM NH Z 4 AlCrN HSC

• With clearance



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		120-140	120-140	120-140	60-80	60-80	60-80	120-140	120-140	60-80	60-80	60-80						

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Standard**

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz		art.no.	€
							stainless steel	austenitic mm/tooth		
4.0	11	20	57	3.70	6	0.30	0.016	0.021	<b>256010 0001</b>	<b>40,90</b>
4.0	11	20	57	3.70	6	0.50	0.016	0.021	256010 0002	40,90
5.0	13	20	57	4.60	6	0.30	0.020	0.026	256010 0003	40,90
5.0	13	20	57	4.60	6	0.50	0.020	0.026	256010 0004	40,90
6.0	13	20	57	5.50	6	0.30	0.024	0.031	256010 0005	40,90
6.0	13	20	57	5.50	6	0.50	0.024	0.031	256010 0006	40,90
6.0	13	20	57	5.50	6	1.00	0.024	0.031	256010 0007	40,90
8.0	20	30	64	7.40	8	0.50	0.030	0.038	256010 0009	59,-
8.0	20	30	64	7.40	8	1.00	0.030	0.038	256010 0010	59,-
10.0	22	32	72	9.20	10	0.50	0.036	0.046	256010 0012	77,30
10.0	22	32	72	9.20	10	1.00	0.036	0.046	256010 0013	77,30
12.0	26	37	83	11.00	12	0.50	0.043	0.054	256010 0014	104,-
12.0	26	37	83	11.00	12	1.00	0.043	0.054	256010 0015	104,-
12.0	26	37	83	11.00	12	2.00	0.043	0.054	256010 0016	104,-
12.0	26	37	83	11.00	12	3.00	0.043	0.054	256010 0018	104,-
16.0	32	46	92	15.00	16	1.00	0.054	0.068	256010 0020	167,-
16.0	32	46	92	15.00	16	2.00	0.054	0.068	256010 0021	167,-
16.0	32	46	92	15.00	16	3.00	0.054	0.068	256010 0022	167,-
20.0	38	58	104	19.00	20	1.00	0.066	0.083	256010 0025	261,-
20.0	38	58	104	19.00	20	2.00	0.066	0.083	256010 0026	261,-
20.0	38	58	104	19.00	20	3.00	0.066	0.083	256010 0027	261,-
20.0	38	58	104	19.00	20	4.00	0.066	0.083	256010 0028	261,-



2153

# Cutting fluid maintenance

**SARA**



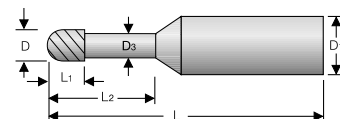
# ATORN® Ultra-MS mini radius milling cutter

VHM
NH

e8
h6
DIN 6535 HA
Z 2
AlCrN

3D PRINT
i Vc/fz
789

• With clearance



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	○	●	●	●	○	○	●	●	●								
		96-112	96-112	96-112	60-80	60-80	60-80	96-112	96-112	60-80	60-80	60-80								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



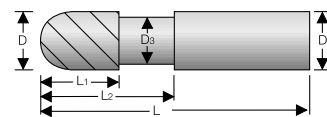
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz		art.no.	€
							stainless steel	austenitic stainless steel		
0.5	0.4	2.0	50	0.45	4	0.25	0.002	0.003	<b>256013 0012</b>	47,-
0.5	0.4	4.0	50	0.45	4	0.25	0.002	0.003	256013 0014	47,-
0.5	0.4	6.0	50	0.45	4	0.25	0.002	0.003	256013 0016	47,-
0.5	0.4	8.0	50	0.45	4	0.25	0.002	0.003	256013 0017	47,-
0.8	0.6	2.0	50	0.75	4	0.40	0.002	0.003	256013 0024	44,60
0.8	0.6	4.0	50	0.75	4	0.40	0.003	0.004	256013 0025	44,60
0.8	0.6	6.0	50	0.75	4	0.40	0.003	0.004	256013 0027	44,60
0.8	0.6	8.0	50	0.75	4	0.40	0.003	0.004	256013 0028	44,60
0.8	0.6	10.0	50	0.75	4	0.40	0.003	0.004	256013 0029	44,60
1.0	0.8	3.0	50	0.95	4	0.50	0.004	0.005	256013 0030	33,-
1.0	0.8	4.0	50	0.95	4	0.50	0.004	0.005	256013 0031	33,-
1.0	0.8	6.0	50	0.95	4	0.50	0.004	0.005	256013 0033	33,-
1.0	0.8	8.0	50	0.95	4	0.50	0.004	0.005	256013 0034	33,-
1.0	0.8	10.0	50	0.95	4	0.50	0.004	0.005	256013 0035	34,-
1.0	0.8	12.0	50	0.95	4	0.50	0.004	0.005	256013 0036	34,-
1.0	0.8	20.0	50	0.95	4	0.50	0.004	0.005	256013 0037	35,20
1.5	1.2	8.0	50	1.45	4	0.75	0.006	0.007	256013 0042	33,-
1.5	1.2	12.0	50	1.45	4	0.75	0.006	0.007	256013 0043	33,-
1.5	1.2	16.0	50	1.45	4	0.75	0.006	0.007	256013 0044	34,-
2.0	1.6	6.0	50	1.95	4	1.00	0.008	0.010	256013 0045	33,-
2.0	1.6	8.0	50	1.95	4	1.00	0.008	0.010	256013 0046	33,-
2.0	1.6	10.0	50	1.95	4	1.00	0.008	0.010	256013 0047	33,-
2.0	1.6	12.0	50	1.95	4	1.00	0.008	0.010	256013 0048	33,-
2.0	1.6	16.0	50	1.95	4	1.00	0.008	0.010	256013 0049	34,-
2.0	1.6	20.0	60	1.95	4	1.00	0.008	0.010	256013 0050	37,90
2.0	1.6	25.0	75	1.95	4	1.00	0.008	0.010	256013 0051	40,90
3.0	2.4	8.0	50	2.85	6	1.50	0.012	0.015	256013 0053	49,10
3.0	2.4	10.0	50	2.85	6	1.50	0.012	0.015	256013 0054	49,10
3.0	2.4	16.0	60	2.85	6	1.50	0.012	0.015	256013 0055	49,10
3.0	2.4	20.0	60	2.85	6	1.50	0.012	0.015	256013 0056	49,10
3.0	2.4	25.0	75	2.85	6	1.50	0.012	0.015	256013 0057	51,90
3.0	2.4	30.0	75	2.85	6	1.50	0.012	0.015	256013 0058	51,90
4.0	3.2	10.0	50	3.85	6	2.00	0.016	0.021	256013 0059	49,10
4.0	3.2	16.0	60	3.85	6	2.00	0.016	0.021	256013 0060	49,10
4.0	3.2	20.0	60	3.85	6	2.00	0.016	0.021	256013 0061	49,10
4.0	3.2	25.0	75	3.85	6	2.00	0.016	0.021	256013 0062	55,-
4.0	3.2	30.0	75	3.85	6	2.00	0.016	0.021	256013 0063	55,-
4.0	3.2	35.0	75	3.85	6	2.00	0.016	0.021	256013 0064	56,-
4.0	3.2	40.0	100	3.85	6	2.00	0.016	0.021	256013 0065	58,-
4.0	3.2	50.0	100	3.85	6	2.00	0.016	0.021	256013 0066	60,10

2153

**ATORN® Ultra-MS radius milling cutter**

VHM NH Z 2 776

• With clearance



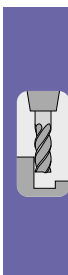
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	○	●	●	●	○	○	●	●	●								
		150-200	150-200	150-200	60-80	70-90	70-90	150-200	150-200	60-80	60-80	60-80								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Standard**

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz		DIN 6535-HA art.no.	€
							stainless steel mm/tooth	austenitic mm/tooth		
3.0	5	20	57	2.80	6	1.50	0.012	0.015	256016 0030	37,90
4.0	6	20	57	3.70	6	2.00	0.016	0.021	256016 0040	37,90
5.0	7	20	57	4.60	6	2.50	0.020	0.026	256016 0050	37,90
6.0	8	20	57	5.50	6	3.00	0.024	0.031	256016 0060	37,90
8.0	10	25	64	7.40	8	4.00	0.030	0.038	256016 0080	49,70
10.0	12	35	75	9.20	10	5.00	0.036	0.046	256016 0100	71,20
12.0	14	35	75	11.00	12	6.00	0.043	0.054	256016 0120	96,70
16.0	18	45	90	15.00	16	8.00	0.054	0.068	256016 0160	167,-
20.0	22	50	100	19.00	20	10.00	0.066	0.083	256016 0200	261,-

2153



**YOUR DRILL**  
**GIVES UP.** • **WHAT DO YOU DO? YOU REACH**  
**FOR A NEW ONE**

**AND SIMPLY CARRY ON:**  
**SARA®GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
 A BRAND OF SARTORIUS WERKZEUGE

# SARA® Diamond-coated end milling cutter DIA+

INFO

Specially designed for our diamond range, the crystalline diamond coating is ideal for machining **graphite, GFRP materials** and **copper**. Thanks to the outstanding coating adhesion on the specially selected carbide, you achieve maximum service life with our diamond range.

This coating is also extremely abrasion-resistant, and there is no typical CVD nose on the sharp cutting edges. This means greater efficiency, lower costs and thus increased yield.

## Special features

- High-tech CVD diamond coating
- Improved geometry
- Increased wear resistance thanks to crystalline diamond coating
- Layer thickness 10+2 µm
- Hardness 10,000 HV

**Especially for machining graphite**

		Ø range mm	Page
Mini torus milling cutter DIA+		Ø 0.2-12	534
Mini radius milling cutter DIA+		Ø 0.2-12	536
Torus milling cutter DIA+, short		Ø 3-16	538
Torus milling cutter DIA+, long		Ø 3-16	539

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																● 95-300			

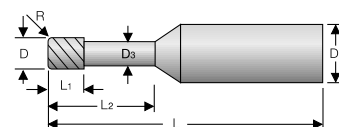
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## SARA® DIA+ mini torus cutter

VHM Typ N 30° h9 h5 DIN 6535 HA Z 2 DIA HSC i Vc/fz 790

- Crystalline diamond coating
- Reliable graphite, GFRP and CFRP machining
- With clearance
- Radius tolerance +/- 0.0003

**Layer thickness 10+2 µm**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																● 95-300			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed for grooving fz graphite mm/tooth	Feed for side milling fz graphite mm/tooth	art.no.	€
0.20	0.20	1	55	0.20	3.00	0.05	0.002	0.003	258005 0001	96,70
0.30	0.30	3	55	0.27	3.00	0.05	0.003	0.004	258005 0004	90,60
0.30	0.30	3	55	0.27	4.00	0.05	0.003	0.004	258005 0005	90,60
0.40	0.40	2	55	0.35	3.00	0.05	0.003	0.004	258005 0007	81,90
0.40	0.40	4	55	0.35	3.00	0.05	0.003	0.004	258005 0008	81,90
0.40	0.40	8	55	0.35	3.00	0.05	0.003	0.004	258005 0009	81,90
0.40	0.40	8	55	0.35	4.00	0.05	0.003	0.004	258005 0010	81,90
0.40	0.40	4	55	0.35	4.00	0.05	0.003	0.004	258005 0012	81,90
0.50	0.50	2	55	0.45	3.00	0.05	0.003	0.004	258005 0013	66,40
0.50	0.50	5	55	0.45	3.00	0.05	0.003	0.004	258005 0014	66,40
0.50	0.50	10	55	0.45	3.00	0.05	0.003	0.004	258005 0015	66,40
0.50	0.50	10	55	0.45	4.00	0.05	0.003	0.004	258005 0016	66,40
0.50	0.50	2	55	0.45	4.00	0.05	0.003	0.004	258005 0017	66,40
0.50	0.50	5	55	0.45	4.00	0.05	0.003	0.004	258005 0018	66,40
0.60	0.80	3	55	0.56	3.00	0.06	0.005	0.008	258005 0019	65,10
0.60	0.80	6	55	0.56	3.00	0.06	0.005	0.008	258005 0020	65,10
0.60	0.80	9	55	0.56	3.00	0.06	0.005	0.008	258005 0021	65,10
0.60	0.80	3	55	0.56	4.00	0.06	0.005	0.008	258005 0023	71,20
0.60	0.80	9	55	0.56	4.00	0.06	0.005	0.008	258005 0025	71,20
0.80	1.00	4	55	0.75	3.00	0.08	0.005	0.008	258005 0027	65,10
0.80	1.00	8	55	0.75	3.00	0.08	0.005	0.008	258005 0028	65,10
0.80	1.00	12	55	0.75	3.00	0.08	0.005	0.008	258005 0029	65,10
0.80	1.00	16	55	0.75	3.00	0.08	0.005	0.008	258005 0030	65,10

2154

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed for grooving fz graphite mm/tooth	Feed for side milling fz graphite mm/tooth	art.no.	€
0.80	1.00	4	55	0.75	4.00	0.08	0.005	0.008	258005 0031	77,30
0.80	1.00	8	55	0.75	4.00	0.08	0.005	0.008	258005 0032	77,30
0.80	1.00	12	55	0.75	4.00	0.08	0.005	0.008	258005 0033	77,30
0.80	1.00	16	55	0.75	4.00	0.08	0.005	0.008	258005 0034	77,30
1.00	1.00	5	55	0.90	3.00	0.10	0.01	0.015	258005 0035	65,10
1.00	1.00	10	55	0.90	3.00	0.10	0.01	0.015	258005 0036	65,10
1.00	1.00	15	55	0.90	3.00	0.10	0.01	0.015	258005 0037	65,10
1.00	1.00	20	55	0.90	3.00	0.10	0.01	0.015	258005 0038	65,10
1.00	1.00	25	55	0.90	3.00	0.10	0.01	0.015	258005 0039	65,10
1.00	1.00	5	55	0.90	4.00	0.10	0.01	0.015	258005 0040	65,10
1.00	1.00	10	55	0.90	4.00	0.10	0.01	0.015	258005 0041	65,10
1.00	1.00	15	55	0.90	4.00	0.10	0.01	0.015	258005 0042	65,10
1.00	1.00	20	55	0.90	4.00	0.10	0.01	0.015	258005 0043	65,10
1.00	1.00	25	55	0.90	4.00	0.10	0.01	0.015	258005 0044	65,10
1.20	1.50	10	55	1.10	3.00	0.12	0.01	0.015	258005 0047	65,10
1.20	1.50	15	55	1.10	4.00	0.12	0.01	0.015	258005 0049	65,10
1.20	1.50	10	55	1.10	4.00	0.12	0.01	0.015	258005 0050	65,10
1.20	1.50	5	55	1.10	4.00	0.12	0.01	0.015	258005 0051	65,10
1.50	2.00	5	55	1.40	3.00	0.15	0.012	0.02	258005 0052	65,10
1.50	2.00	8	55	1.40	3.00	0.15	0.012	0.02	258005 0053	65,10
1.50	2.00	10	55	1.40	3.00	0.15	0.012	0.02	258005 0054	65,10
1.50	2.00	15	55	1.40	3.00	0.15	0.012	0.02	258005 0055	65,10
1.50	2.00	20	55	1.40	3.00	0.15	0.012	0.02	258005 0056	65,10
1.50	2.00	25	55	1.40	3.00	0.15	0.012	0.02	258005 0057	65,10
1.50	2.00	25	55	1.40	4.00	0.15	0.012	0.02	258005 0058	65,10
1.50	2.00	20	55	1.40	4.00	0.15	0.012	0.02	258005 0059	65,10
1.50	2.00	15	55	1.40	4.00	0.15	0.012	0.02	258005 0060	65,10
1.50	2.00	10	55	1.40	4.00	0.15	0.012	0.02	258005 0061	65,10
1.80	2.00	20	55	1.70	3.00	0.18	0.012	0.025	258005 0066	65,10
2.00	2.00	10	65	1.90	3.00	0.20	0.015	0.025	258005 0069	65,10
2.00	2.00	15	65	1.90	3.00	0.20	0.015	0.025	258005 0070	65,10
2.00	2.00	20	65	1.90	3.00	0.20	0.015	0.025	258005 0071	65,10
2.00	2.00	25	65	1.90	3.00	0.20	0.015	0.025	258005 0072	65,10
2.00	2.00	10	65	1.90	3.00	0.50	0.015	0.025	258005 0073	65,10
2.00	2.00	15	65	1.90	3.00	0.50	0.015	0.025	258005 0074	65,10
2.00	2.00	20	65	1.90	3.00	0.50	0.015	0.025	258005 0075	65,10
2.00	2.00	25	65	1.90	3.00	0.50	0.015	0.025	258005 0076	65,10
2.00	2.00	25	65	1.90	4.00	0.50	0.015	0.025	258005 0077	65,10
2.00	2.00	10	65	1.90	4.00	0.20	0.015	0.025	258005 0079	65,10
2.00	2.00	15	65	1.90	4.00	0.20	0.015	0.025	258005 0080	65,10
2.00	2.00	20	65	1.90	4.00	0.20	0.015	0.025	258005 0081	65,10
2.00	2.00	25	65	1.90	4.00	0.20	0.015	0.025	258005 0082	65,10
2.00	2.00	10	65	1.90	4.00	0.50	0.015	0.025	258005 0083	65,10
2.00	2.00	15	65	1.90	4.00	0.50	0.015	0.025	258005 0085	65,10
2.00	2.00	20	65	1.90	4.00	0.50	0.015	0.025	258005 0086	65,10
3.00	3.00	15	65	2.90	4.00	0.30	0.02	0.03	258005 0087	80,90
3.00	3.00	25	75	2.90	4.00	0.30	0.02	0.03	258005 0088	80,90
3.00	3.00	10	65	2.90	4.00	0.50	0.02	0.03	258005 0089	80,90
3.00	3.00	15	65	2.90	4.00	0.50	0.02	0.03	258005 0090	80,90
3.00	3.00	20	65	2.90	4.00	0.50	0.02	0.03	258005 0091	80,90
3.00	3.00	25	75	2.90	4.00	0.50	0.02	0.03	258005 0092	80,90
3.00	3.00	30	75	2.90	4.00	0.50	0.02	0.03	258005 0093	80,90
3.00	3.00	20	65	2.90	6.00	0.50	0.02	0.03	258005 0095	105,-
4.00	4.00	15	65	3.90	6.00	0.30	0.03	0.04	258005 0094	105,-
4.00	4.00	15	65	3.90	6.00	0.40	0.03	0.04	258005 0097	105,-
4.00	4.00	25	75	3.90	6.00	0.40	0.03	0.04	258005 0098	105,-
4.00	4.00	20	65	3.90	6.00	0.50	0.03	0.04	258005 0099	96,70
4.00	4.00	30	75	3.90	6.00	0.50	0.03	0.04	258005 0100	96,70
4.00	4.00	40	90	3.90	6.00	0.50	0.03	0.04	258005 0101	100,50

2154

Continued on next page &gt;&gt;&gt;

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed for grooving fz graphite mm/tooth	Feed for side milling fz graphite mm/tooth	art.no.	€
5.00	5.00	20	75	4.90	6.00	0.50	0.045	0.06	258005 0102	114,50
5.00	5.00	30	75	4.90	6.00	0.50	0.045	0.06	258005 0103	114,50
5.00	5.00	40	90	4.90	6.00	0.50	0.045	0.06	258005 0104	114,50
5.00	5.00	50	90	4.90	6.00	0.50	0.045	0.06	258005 0105	114,50
6.00	6.00	30	75	5.90	6.00	0.30	0.045	0.06	258005 0106	114,50
6.00	6.00	30	75	5.90	6.00	0.50	0.045	0.06	258005 0107	114,50
6.00	6.00	40	90	5.90	6.00	0.50	0.045	0.06	258005 0108	122,-
6.00	6.00	50	90	5.90	6.00	0.50	0.045	0.06	258005 0109	122,-
6.00	6.00	60	100	5.90	6.00	0.50	0.045	0.06	258005 0110	122,-
6.00	6.00	30	75	5.90	6.00	1.00	0.045	0.06	258005 0111	122,-
6.00	6.00	40	90	5.90	6.00	1.00	0.045	0.06	258005 0112	122,-
8.00	8.00	30	80	7.80	8.00	0.50	0.06	0.08	258005 0113	169,-
8.00	8.00	60	100	7.80	8.00	0.50	0.06	0.08	258005 0114	169,-
8.00	8.00	30	80	7.80	8.00	1.00	0.06	0.08	258005 0115	169,-
8.00	8.00	60	100	7.80	8.00	1.00	0.06	0.08	258005 0116	169,-
10.00	10.00	30	80	9.80	10.00	0.50	0.08	0.1	258005 0117	205,-
10.00	10.00	60	100	9.80	10.00	0.50	0.08	0.1	258005 0118	205,-
10.00	10.00	30	80	9.80	10.00	1.00	0.08	0.1	258005 0119	205,-
10.00	10.00	60	100	9.80	10.00	1.00	0.08	0.1	258005 0120	205,-
12.00	12.00	60	100	11.80	12.00	1.00	0.1	0.12	258005 0124	279,-

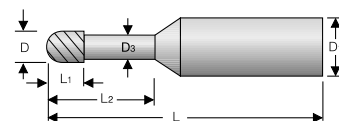
2154

### SARA® DIA+ mini radius milling cutter

VHM
Typ N
30°
h9
h5
DIN 6535 HA
Z 2
DIA
HSC
Vc/fz 790

- Crystalline diamond coating
- Reliable graphite, GFRP and CFRP machining
- With clearance
- Radius tolerance +/- 0.0003

**Layer thickness 10+2 µm**



material	● very well suited	steel			stainless steel			cast iron		superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	titanium alloys	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
															●	95-300			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed for grooving fz graphite mm/tooth	Feed for side milling fz graphite mm/tooth	art.no.	€
0.20	0.20	1	55	0.18	3.00	0.1	0.002	0.003	258006 0001	96,70
0.20	0.20	1	55	0.18	4.00	0.1	0.002	0.003	258006 0002	96,70
0.30	0.30	1	55	0.27	3.00	0.15	0.003	0.004	258006 0003	90,60
0.30	0.30	3	55	0.27	3.00	0.15	0.003	0.004	258006 0004	90,60
0.30	0.30	5	55	0.27	3.00	0.15	0.003	0.004	258006 0005	90,60
0.30	0.30	1	55	0.27	4.00	0.15	0.003	0.004	258006 0006	90,60
0.30	0.30	3	55	0.27	4.00	0.15	0.003	0.004	258006 0007	90,60
0.30	0.30	5	55	0.27	4.00	0.15	0.003	0.004	258006 0008	90,60
0.30	0.30	8	55	0.27	4.00	0.15	0.003	0.004	258006 0009	90,60
0.40	0.40	4	55	0.35	3.00	0.2	0.003	0.004	258006 0011	81,90
0.40	0.40	6	55	0.35	3.00	0.2	0.003	0.004	258006 0012	81,90
0.40	0.40	8	55	0.35	3.00	0.2	0.003	0.004	258006 0013	81,90
0.40	0.40	4	55	0.35	4.00	0.2	0.003	0.004	258006 0014	81,90
0.40	0.40	6	55	0.35	4.00	0.2	0.003	0.004	258006 0015	81,90
0.40	0.40	8	55	0.35	4.00	0.2	0.003	0.004	258006 0016	81,90
0.50	0.50	5	55	0.45	3.00	0.25	0.003	0.004	258006 0017	66,40
0.50	0.50	10	55	0.45	3.00	0.25	0.003	0.004	258006 0018	66,40
0.50	0.50	5	55	0.45	4.00	0.25	0.003	0.004	258006 0019	69,90
0.50	0.50	10	55	0.45	4.00	0.25	0.003	0.004	258006 0020	69,90

2154

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed for grooving fz graphite mm/tooth	Feed for side milling fz graphite mm/tooth	art.no.	€
0.60	0.80	6	55	0.56	3.00	0.3	0.005	0.008	258006 0021	66,40
0.60	0.80	9	55	0.56	3.00	0.3	0.005	0.008	258006 0022	66,40
0.60	0.80	12	55	0.56	3.00	0.3	0.005	0.008	258006 0023	66,40
0.60	0.80	6	55	0.56	4.00	0.3	0.005	0.008	258006 0024	69,90
0.60	0.80	9	55	0.56	4.00	0.3	0.005	0.008	258006 0025	69,90
0.60	0.80	12	55	0.56	4.00	0.3	0.005	0.008	258006 0026	69,90
0.70	0.90	7	55	0.65	3.00	0.35	0.005	0.008	258006 0027	66,40
0.70	0.90	14	55	0.65	3.00	0.35	0.005	0.008	258006 0028	66,40
0.70	0.90	7	55	0.65	4.00	0.35	0.005	0.008	258006 0029	69,90
0.80	1.00	8	55	0.75	3.00	0.4	0.005	0.008	258006 0031	66,40
0.80	1.00	12	55	0.75	3.00	0.4	0.005	0.008	258006 0032	66,40
0.80	1.00	16	55	0.75	3.00	0.4	0.005	0.008	258006 0033	66,40
0.80	1.00	8	55	0.75	4.00	0.4	0.005	0.008	258006 0034	69,90
0.80	1.00	12	55	0.75	4.00	0.4	0.005	0.008	258006 0035	69,90
0.80	1.00	16	55	0.75	4.00	0.4	0.005	0.008	258006 0036	69,90
1.00	1.00	5	55	0.90	3.00	0.5	0.01	0.015	258006 0037	66,40
1.00	1.00	10	55	0.90	3.00	0.5	0.01	0.015	258006 0038	66,40
1.00	1.00	15	55	0.90	3.00	0.5	0.01	0.015	258006 0039	66,40
1.00	1.00	20	55	0.90	3.00	0.5	0.01	0.015	258006 0040	66,40
1.00	1.00	25	55	0.90	3.00	0.5	0.01	0.015	258006 0041	66,40
1.00	1.00	30	55	0.90	3.00	0.5	0.01	0.015	258006 0042	66,40
1.00	1.00	5	55	0.90	4.00	0.5	0.01	0.015	258006 0077	69,90
1.00	1.00	10	55	0.90	4.00	0.5	0.01	0.015	258006 0078	69,90
1.00	1.00	15	55	0.90	4.00	0.5	0.01	0.015	258006 0079	69,90
1.00	1.00	20	55	0.90	4.00	0.5	0.01	0.015	258006 0080	69,90
1.00	1.00	25	55	0.90	4.00	0.5	0.01	0.015	258006 0081	69,90
1.00	1.00	30	55	0.90	4.00	0.5	0.01	0.015	258006 0082	69,90
1.20	1.50	5	55	1.10	3.00	0.6	0.01	0.015	258006 0044	66,40
1.20	1.50	10	55	1.10	3.00	0.6	0.01	0.015	258006 0045	66,40
1.20	1.50	15	55	1.10	3.00	0.6	0.01	0.015	258006 0046	66,40
1.20	1.50	10	55	1.10	4.00	0.6	0.01	0.015	258006 0084	69,90
1.20	1.50	15	55	1.10	4.00	0.6	0.01	0.015	258006 0085	69,90
1.50	2.00	5	55	1.40	3.00	0.75	0.012	0.02	258006 0047	66,40
1.50	2.00	10	55	1.40	3.00	0.75	0.012	0.02	258006 0048	66,40
1.50	2.00	15	55	1.40	3.00	0.75	0.012	0.02	258006 0049	66,40
1.50	2.00	20	55	1.40	3.00	0.75	0.012	0.02	258006 0050	66,40
1.50	2.00	25	55	1.40	3.00	0.75	0.012	0.02	258006 0051	66,40
1.50	2.00	15	55	1.40	6.00	0.75	0.012	0.02	258006 0052	105,—
1.50	2.00	5	55	1.40	4.00	0.75	0.012	0.02	258006 0086	69,90
1.50	2.00	10	55	1.40	4.00	0.75	0.012	0.02	258006 0087	69,90
1.50	2.00	15	55	1.40	4.00	0.75	0.012	0.02	258006 0088	69,90
1.50	2.00	20	55	1.40	4.00	0.75	0.012	0.02	258006 0089	69,90
1.50	2.00	25	55	1.40	4.00	0.75	0.012	0.02	258006 0090	69,90
2.00	2.00	10	55	1.90	3.00	1	0.015	0.025	258006 0055	66,40
2.00	2.00	15	55	1.90	3.00	1	0.015	0.025	258006 0056	66,40
2.00	2.00	20	55	1.90	3.00	1	0.015	0.025	258006 0057	66,40
2.00	2.00	25	65	1.90	3.00	1	0.015	0.025	258006 0058	66,40
2.00	2.00	30	65	1.90	3.00	1	0.015	0.025	258006 0059	66,40
2.00	2.00	20	65	2.40	6.00	1.25	0.015	0.025	258006 0061	105,—
2.00	2.00	10	55	1.90	4.00	1	0.015	0.025	258006 0093	69,90
2.00	2.00	15	55	1.90	4.00	1	0.015	0.025	258006 0094	69,90
2.00	2.00	20	55	1.90	4.00	1	0.015	0.025	258006 0095	69,90
2.00	2.00	25	65	1.90	4.00	1	0.015	0.025	258006 0096	69,90
2.00	2.00	30	65	1.90	4.00	1	0.015	0.025	258006 0097	69,90
3.00	3.00	10	65	2.90	4.00	1.5	0.02	0.03	258006 0063	79,60
3.00	3.00	15	65	2.90	4.00	1.5	0.02	0.03	258006 0064	79,60
3.00	3.00	20	65	2.90	4.00	1.5	0.02	0.03	258006 0065	79,60
3.00	3.00	25	75	2.90	4.00	1.5	0.02	0.03	258006 0066	79,60



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed for grooving fz graphite mm/tooth	Feed for side milling fz graphite mm/tooth	art.no.	€
3.00	3.00	30	75	2.90	4.00	1.5	0.02	0.03	258006 0067	79,60
3.00	3.00	20	65	2.90	6.00	1.5	0.02	0.03	258006 0068	105,-
4.00	4.00	20	65	3.90	6.00	2	0.03	0.04	258006 0070	114,50
4.00	4.00	30	75	3.90	6.00	2	0.03	0.04	258006 0071	116,-
4.00	4.00	40	90	3.90	6.00	2	0.03	0.04	258006 0072	119,50
5.00	5.00	20	65	4.90	6.00	2.5	0.045	0.06	258006 0073	116,-
5.00	5.00	30	75	4.90	6.00	2.5	0.045	0.06	258006 0074	119,50
5.00	5.00	40	90	4.90	6.00	2.5	0.045	0.06	258006 0075	119,50
5.00	5.00	50	90	4.90	6.00	2.5	0.045	0.06	258006 0076	119,50
6.00	6.00	30	75	5.90	6.00	3	0.045	0.06	258006 0098	121,-
6.00	6.00	40	90	5.90	6.00	3	0.045	0.06	258006 0099	127,-
6.00	6.00	50	90	5.90	6.00	3	0.045	0.06	258006 0100	127,-
6.00	6.00	60	100	5.90	6.00	3	0.045	0.06	258006 0101	127,-
8.00	8.00	30	80	7.80	8.00	4	0.06	0.08	258006 0102	171,50
8.00	8.00	60	100	7.80	8.00	4	0.06	0.08	258006 0103	175,-
10.00	10.00	30	80	9.80	10.00	5	0.08	0.1	258006 0104	205,-
10.00	10.00	60	100	9.80	10.00	5	0.08	0.1	258006 0105	205,-
12.00	12.00	30	83	11.80	12.00	6	0.1	0.12	258006 0106	255,-
12.00	12.00	60	100	11.80	12.00	6	0.1	0.12	258006 0107	279,-

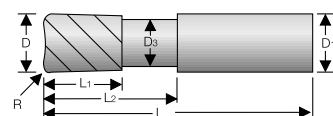
2154

**SARA® DIA+ torus cutter**

VHM Typ N 30° h9 h5 DIN 6535 HA Z 4 DIA HSC Vc/fz 790

- Crystalline diamond coating
- Reliable graphite, GFRP and CFRP machining
- With clearance

**Layer thickness 6+2 µm**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc
																95-300			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**Short**

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed for grooving fz graphite mm/tooth	Feed for side milling fz graphite mm/tooth	art.no.	€
3.00	6.00	14	50	2.70	3.00	0.3	0.02	0.03	258013 0001	61,10
3.00	6.00	14	50	2.70	3.00	0.5	0.02	0.03	258013 0002	61,10
4.00	8.00	16	50	3.70	4.00	0.4	0.03	0.04	258013 0004	65,10
4.00	8.00	16	50	3.70	4.00	0.5	0.03	0.04	258013 0005	65,10
4.00	8.00	16	50	3.70	4.00	1	0.03	0.04	258013 0006	65,10
5.00	10.00	18	54	4.60	5.00	0.5	0.045	0.06	258013 0007	75,80
6.00	13.00	21	57	5.50	6.00	0.5	0.045	0.06	258013 0009	90,60
8.00	15.00	27	63	7.40	8.00	0.5	0.06	0.08	258013 0012	125,-
8.00	15.00	27	63	7.40	8.00	1	0.06	0.08	258013 0013	125,-
10.00	18.00	32	72	9.20	10.00	0.5	0.08	0.1	258013 0016	158,-
10.00	18.00	32	72	9.20	10.00	1	0.08	0.1	258013 0017	158,-
12.00	26.00	38	83	11.00	12.00	0.5	0.1	0.12	258013 0020	184,50

2154





Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed for grooving fz graphite mm/tooth	Feed for side milling fz graphite mm/tooth	art.no.	€
3.00	6.00	32	80	2.70	3.00	0.3	0.020	0.030	258014 0001	69,-
3.00	6.00	32	80	2.70	3.00	0.5	0.020	0.030	258014 0002	69,-
4.00	8.00	36	80	3.70	4.00	0.5	0.030	0.040	258014 0005	78,40
6.00	13.00	44	90	5.50	6.00	0.5	0.045	0.055	258014 0009	105,-
6.00	13.00	44	90	5.50	6.00	1	0.045	0.055	258014 0010	105,-
8.00	15.00	54	100	7.40	8.00	0.5	0.060	0.070	258014 0012	144,50
10.00	18.00	60	100	9.20	10.00	0.5	0.080	0.100	258014 0016	184,50
10.00	18.00	60	100	9.20	10.00	1	0.080	0.100	258014 0017	184,50
10.00	18.00	60	100	9.20	10.00	1.5	0.080	0.100	258014 0018	184,50
10.00	18.00	60	100	9.20	10.00	2	0.080	0.100	258014 0019	184,50
12.00	26.00	75	120	11.00	12.00	0.5	0.100	0.120	258014 0020	224,-
12.00	26.00	75	120	11.00	12.00	1	0.100	0.120	258014 0021	224,-
12.00	26.00	75	120	11.00	12.00	1.5	0.100	0.120	258014 0022	224,-
12.00	26.00	75	120	11.00	12.00	2	0.100	0.120	258014 0023	224,-
16.00	32.00	85	120	15.00	16.00	0.5	0.200	0.250	258014 0024	399,-
16.00	32.00	85	120	15.00	16.00	1	0.200	0.250	258014 0025	399,-
16.00	32.00	85	120	15.00	16.00	1.5	0.200	0.250	258014 0026	399,-
16.00	32.00	85	120	15.00	16.00	2	0.200	0.250	258014 0027	399,-

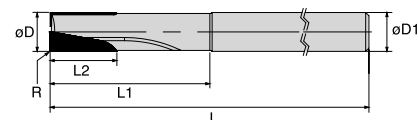
2154

palbit PKD end milling cutter

NEW

PKD Z 2 Z 3 799

- One or two cutting inserts made of polycrystalline diamond (PKD) are attached to the shank for centre cutting.
- **Application:** for aluminium, reinforced plastics, graphite, composites and other highly abrasive materials
- Due to its extreme hardness and low wear, **non-ferrous metals** such as aluminium can be machined without any cooling.
- This achieves the best surface finishes
- Long service life and cutting speed and can be reground multiple times
- **Please note that diamond tools are not suitable for calibration with measurement systems that require an electronic contact due to their lack of electrical conductivity.**



material	● very well suited	○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium	copper	graphite	hardened steel			
			< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
														●	●	●				
														200-6000	200-4000	250-3000	100-2500			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.




D mm	L1 mm	L2 mm	L mm	D1 mm	R mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4	6.40	6	51	6	0.10	2	0.20	253025 0040	98,40
5	8.40	8	51	6	0.10	2	0.20	253025 0050	123,-
6	21	8	63	6	0.10	2	0.20	253025 0060	135,50
8	27	8	63	8	0.10	2	0.20	253025 0080	166,-
8	27	12	63	8	0.10	2	0.20	253025 1080	195,-
10	32	8	72	10	0.10	2	0.20	253025 0100	215,-
10	32	16	72	10	0.10	2	0.20	253025 1100	263,-
12	38	8	83	12	0.10	2	0.20	253025 0120	269,-
12	38	16	83	12	0.10	2	0.20	253025 1120	275,-
14	38	8	83	14	0.10	3	0.20	253026 0140	375,-
14	38	16	83	14	0.10	3	0.20	253026 1140	485,-
16	52	12	100	16	0.10	3	0.20	253026 0160	450,-
16	52	20	100	16	0.10	3	0.20	253026 1160	599,-

2176

palbit **PKD radius milling cutter**

NEW

PKD **DIN 6535 HA** Z 1 Z 2   799

- One or two cutting inserts made of polycrystalline diamond (PKD) are attached to the shank for centre cutting.
- **Application:** for aluminium, reinforced plastics, graphite, composites and other highly abrasive materials
- Due to its extreme hardness and low wear, **non-ferrous metals** such as aluminium can be machined without any cooling
- This achieves the best surface finishes
- Long service life and cutting speed and can be reground multiple times
- **Please note that diamond tools are not suitable for calibration with measurement systems that require an electronic contact due to their lack of electrical conductivity.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													●	●		●			
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		




D	L1	L2	L	D1	R	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	30	5	60	3	1.50	1	0.02	253021 0030	83,60
4	30	10	60	4	2.0	1	0.025	253021 0040	131,50
6	40	10	80	6	3.0	2	0.035	253022 0060	200,-
8	40	10	80	8	4.0	2	0.05	253022 0080	219,-
10	40	10	80	10	5.0	2	0.06	253022 0100	242,-
12	60	10	100	12	6.0	2	0.075	253022 0120	323,-

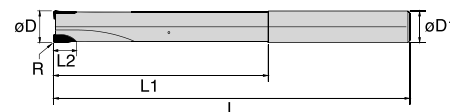
2176

palbit **Torus milling cutter PKD**

NEW

PKD **DIN 6535 HA** Z 1 Z 2   799

- One or two cutting inserts made of polycrystalline diamond (PKD) are attached to the shank for centre cutting.
- **Application:** for aluminium, reinforced plastics, graphite, composites and other highly abrasive materials
- Due to its extreme hardness and low wear, **non-ferrous metals** such as aluminium can be machined without any cooling
- This achieves the best surface finishes
- Long service life and cutting speed and can be reground multiple times
- **Please note that diamond tools are not suitable for calibration with measurement systems that require an electronic contact due to their lack of electrical conductivity.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													●	●		●			
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		



D	L1	L2	L	D1	R	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	30	5	60	3	0.30	1	0.020	253023 0030	67,70
4	45	5	75	4	0.30	1	0.025	253024 0040	110,-
6	60	6	100	6	0.30	2	0.035	253024 0060	100,50
8	80	6	125	8	0.30	2	0.050	253024 0080	190,50
10	100	6	150	10	0.30	2	0.060	253024 0100	215,-
12	100	7	150	12	0.30	2	0.075	253024 0120	299,-

2176

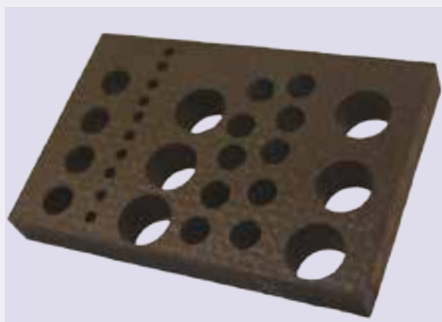
## Solutions for composite

The efficient machining of modern materials such as fibre-reinforced plastics, honeycomb composites, aluminium, titanium and composites requires a new generation of cutting tools. The interaction of geometry, cutting material and coating creates the right material for machining such modern materials. All materials are designed to satisfy a range of requirements that occur when machining new materials.

Our tools have proven their quality in various tests: Proven cutting angle and cutting material combined with specially polished chip flutes ensure low cutting forces and problem-free chip removal.

This prevents delamination, outstanding residual fibres, roll-over and thermal damage to the workpiece.

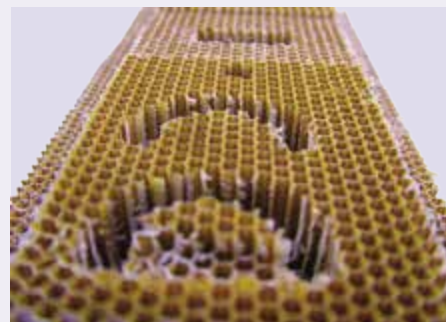
We offer a comprehensive range of high-performance tools for optimum drilling and milling results in modern materials.



CFRP



CFRP-titanium sandwich



Honeycomb



Fibre plastics



Alu honeycomb with GFRP cover



Aluminium honeycomb with aluminium cover



### Polished chip flute

Rapid-Line HSC milling cutters have considerably enhanced chip flow. Machining temperatures are lower, thus avoiding overheating and welding pick-up. Rapid-Line milling cutters have a significantly longer service life and can also produce better surface qualities. We recommend our "RAPID-Shine" product range for machining ultra-transparent surfaces. Thanks to their special cutting geometry and lapped cutting edges, these milling cutters are ideal for machining ultra-transparent plastic materials.



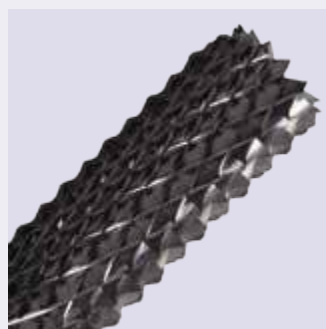
### Pyramid tooth

A special grinding process combines polished chip flutes and ultra-sharp cutting edges. This results in low friction coefficients and high cutting stability. Designed primarily for machining CFRP and GFRP, we offer 3 different profile types - Fine, Medium and Coarse - as well as 3 different spur toothings for drilling, face milling and edge banding.



### Honeycomb

The honeycomb structure is first cut and then separated, but never crushed. The result is high-quality surfaces that can be machined further with ease.



### Coating

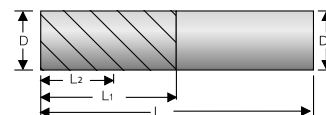
Our customers' requirements are diverse. Depending on the machining process, we offer various coatings to enhance the machining result. Whether extremely thin diamond HC coating or a multi-layer diamond coating, we have the right coating for your application.

## ATORN® Compression milling cutter

**Additional versions available from the manufacturer**



- For fibre plastics
- **Counter-rotating chip flutes with chip breakers**
- Spiralisation change from left to right
- Axial cutting forces converge in the centre
- **Finishing quality ( $ra < 2 \mu m$ )**
- Simultaneously pulling and pushing cut
- **Surface Dia-HC-coated**



material	● very well suited ○ well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP /CFRP		graphite
		< 8 % Si	≥ 8 % Si	Cu-alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
											● 150-250	● 150-250	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Short

D mm	L1 mm	L mm	L2 mm	D1 mm	art.no.	€
6	13	57	4	6	250600 0060	90,10
8	19	63	6	8	250600 0080	117,-
10	22	72	7	10	250600 0100	140,50
12	26	83	8	12	250600 0120	219,-

2168



### Medium

D mm	L1 mm	L mm	L2 mm	D1 mm	art.no.	€
6	13	57	6.5	6	250601 0060	90,10
8	19	63	9.5	8	250601 0080	117,-
10	22	72	11	10	250601 0100	140,50
12	26	83	13	12	250601 0120	219,-

2168

### Long

D mm	L1 mm	L mm	L2 mm	D1 mm	art.no.	€
6	22	60	11	6	250602 0060	99,70
8	32	78	16	8	250602 0080	133,50
10	35	78	35	10	250602 0100	156,-
12	40	83	40	12	250602 0120	234,-

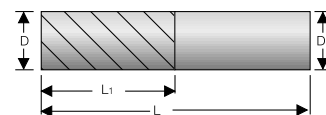
2168

## ATORN® HSC milling cutter Z5

**Additional versions available from the manufacturer**



- For fibre composite materials
- Large chip flutes with synchronous chip-breakers
- **Continuous cut, good chip removal**
- Straight grooves, no tensile forces on the workpiece
- **Dia-HC-coated**



material	● very well suited ○ well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP /CFRP		graphite
		< 8 % Si	≥ 8 % Si	Cu-alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
											● 150-250	● 150-250	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	art.no.	€
4	14	40	6	250603 0040	48,70
5	16	50	6	250603 0050	44,30
6	18	50	6	250603 0060	47,50
8	20	63	8	250603 0080	71,70
10	25	72	10	250603 0100	97,70
12	30	83	10	250603 0120	133,50

2168

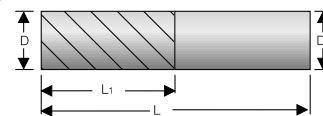


## ATORN® HSC milling cutter Z6

Additional versions available from the manufacturer

VHM       791

- Fibre composite materials
- Large chip flutes with synchronous chip-breakers**
- Continuous cut, good chip removal
- Dia-HC-coated**



material	● very well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP /CFRP		graphite
	○ well suited	< 8 % Si	≥ 8 % Si	Co-alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
											150-250	150-250	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	art.no.	€
4	20	50	6	250604 0040	48,70
5	16	50	6	250604 0050	44,30
6	18	50	6	250604 0060	47,50
6	35	75	6	250604 0061	65,60
8	20	63	8	250604 0080	71,70
8	40	100	8	250604 0081	91,10
10	25	72	10	250604 0100	97,70
12	30	83	12	250604 0120	133,50



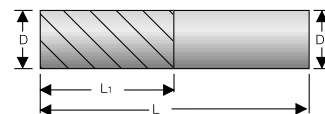
2168

## ATORN® Milling cutters with pyramid-shaped toothing

Additional versions available from the manufacturer

VHM   791

- Pyramid-shaped bevel toothing, draw cutting
- Multi-tooth milling cutter front for grooving and face milling
- Extremely sharp cutting edges
- Fine: Fibre plastics with a high fibre content**
- Medium: soft fibre plastics with an adhesive tendency**
- Coarse: Sandwich materials and foams**
- Polished surface



material	● very well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP /CFRP		graphite
	○ well suited	< 8 % Si	≥ 8 % Si	Co-alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
							200-300		200-250		150-250	150-250	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Fine		Medium		Coarse	
				art.no.	€	art.no.	€	art.no.	€
4	15	40	4	250605 0040	17,80	250606 0040	17,80	250607 0040	17,80
5	16	50	5	250605 0050	23,50	250606 0050	23,50	250607 0050	23,50
6	18	50	6	250605 0060	26,-	250606 0060	26,-	250607 0060	26,-
8	25	63	8	250605 0080	39,20	250606 0080	39,20	250607 0080	39,20
10	30	72	10	250605 0100	54,50	250606 0100	54,50	250607 0100	54,50
12	32	83	12	250605 0120	76,80	250606 0120	76,80	250607 0120	76,80



2168

2168

2168

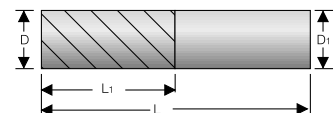


## ATORN® Milling cutters with groove milling head

**Additional versions available from the manufacturer**

VHM      791

- Pyramid-shaped bevel tooling, draw cutting
- Groove milling cutter bit for drilling, grooving, edge banding
- Extremely sharp cutting edges
- **Fine: fibre plastics with a high fibre content**
- **Medium: soft fibre plastics with an adhesive tendency**
- **Coarse: sandwich materials and foams**
- Polished and/or **Dia-HC-coated**



material	● very well suited ○ well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP /CFRP		graphite
		< 8 % Si	≥ 8 % Si	Cu alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
							200-300		200-250		150-250	150-250	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Uncoated

D mm	L1 mm	L mm	D1 mm	Fine		Medium		Coarse		
				art.no.	€	art.no.	€	art.no.	€	
4	15	40	4	250608 0040	19,05	250610 0040	19,05	250612 0040	19,05	
5	16	50	5	250608 0050	25,20	250610 0050	25,20	250612 0050	25,20	
6	18	50	6	250608 0060	27,70	250610 0060	27,70	250612 0060	27,70	
6	35	75	6	250608 0061	47,10	250610 0061	47,10	250612 0061	47,10	
8	25	63	8	250608 0080	41,40	250610 0080	41,40	250612 0080	41,40	
8	40	100	8	250608 0081	65,10	250610 0081	65,10	250612 0081	65,10	
10	30	72	10	250608 0100	56,50	250610 0100	56,50	250612 0100	56,50	
12	32	83	12	250608 0120	79,40	250610 0120	79,40	250612 0120	79,40	
				2168		2168		2168		



### Dia-HC-coated

D mm	L1 mm	L mm	D1 mm	Fine		Medium		Coarse		
				art.no.	€	art.no.	€	art.no.	€	
4	15	40	4	250609 0040	27,80	250611 0040	27,80	250613 0040	27,80	
5	16	50	5	250609 0050	34,-	250611 0050	34,-	250613 0050	34,-	
6	18	50	6	250609 0060	36,80	250611 0060	36,80	250613 0060	36,80	
6	35	75	6	250609 0061	56,50	250611 0061	56,50	250613 0061	56,50	
8	25	63	8	250609 0080	54,50	250611 0080	54,50	250613 0080	54,50	
8	40	100	8	250609 0081	78,40	250611 0081	78,40	250613 0081	78,40	
10	30	72	10	250609 0100	74,30	250611 0100	74,30	250613 0100	74,30	
12	32	83	12	250609 0120	100,50	250611 0120	100,50	250613 0120	100,50	
				2168		2168		2168		

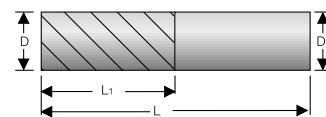


## ATORN® Face milling cutter with face radius

**Additional versions available from the manufacturer**

VHM     791

- Pyramid-shaped bevel tooling, draw cutting
- Face radius for copy milling
- Extremely sharp cutting edges
- **Medium: soft fibre plastics with an adhesive tendency**
- **Dia-HC-coated**



material	● very well suited ○ well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP /CFRP		graphite
		< 8 % Si	≥ 8 % Si	Cu alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
											150-250	150-250	

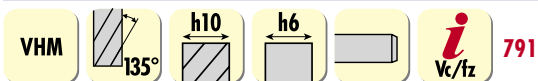
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Medium	
				art.no.	€
4	15	40	4	250614 0040	30,50
6	18	50	6	250614 0060	38,30
8	25	36	8	250614 0080	57,-
8	40	100	8	250614 0081	86,-
10	30	72	10	250614 0100	77,30
12	32	83	12	250614 0120	103,-
				2168	

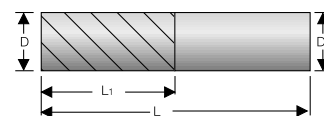


### ATORN® Drilling cutter with drill bit

Additional versions available from the manufacturer



- Pyramid-shaped bevel toothing, draw cutting
- Drill bit 135° for drilling and edge banding
- Extremely sharp cutting edges
- **Fine: Fibre plastics with a high fibre content**
- **Medium: soft fibre plastics with an adhesive tendency**
- **Coarse: Sandwich materials and foams**
- Polished surface



material	● very well suited ○ well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP /CFRP		graphite
		< 8 % Si	≥ 8 % Si	Cu-alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
							● 200-300		● 200-250		● 150-250	● 150-250	

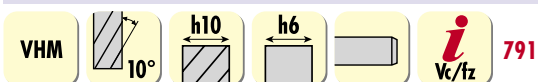
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Fine		Medium		Coarse	
				art.no.	€	art.no.	€	art.no.	€
4	15	40	4	250615 0040	20,20	250616 0040	20,20	250617 0040	20,20
5	16	50	5	250615 0050	26,50	250616 0050	26,50	250617 0050	26,50
6	18	50	6	250615 0060	28,80	250616 0060	28,80	250617 0060	28,80
8	25	63	8	250615 0080	43,20	250616 0080	43,20	250617 0080	43,20
10	30	72	10	250615 0100	58,50	250616 0100	58,50	250617 0100	58,50
12	32	83	12	250615 0120	82,90	250616 0120	82,90	250617 0120	82,90
				2168	2168		2168		

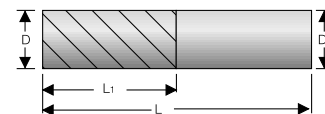


### ATORN® Milling cutters for honeycomb composite materials

Additional versions available from the manufacturer



- For honeycomb composite materials
- Special toothing with drawing cut
- Good surface for further finishing
- **Extremely sharp cutting edges**
- Multi-flute spur toothing
- From Ø 16 mm with HSS shank



material	● very well suited ○ well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP /CFRP		graphite
		< 8 % Si	≥ 8 % Si	Cu-alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
									● 300				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	art.no.	€
6	16	50	6	250619 0060	38,30
8	19	63	8	250619 0080	57,50
10	22	72	10	250619 0100	79,40
12	26	83	12	250619 0120	111,-
16	17	100	12	250619 0160	175,-
20	17	100	12	250619 0200	234,-

2168



# OPTIMAL SOLUTIONS FOR GRINDING AND CUTTING

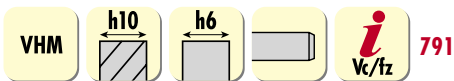


**PFERD**  
Grinding and cutting  
763 pages  
Art.no. 019900 0216

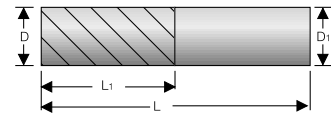
Overview of all free manufacturers' catalogues on page 16/17

## ATORN® Milling cutters for Aramid fibrous materials

**Additional versions available from the manufacturer**



- For fibrous materials (aramid, Kevlar®)
- Counter-rotating toothing
- Right-hand cutting with right-hand/left-hand twist
- Extremely sharp cutting edges
- No delamination with textile structures
- Polished surface



material	● very well suited ○ well suited	aluminium		copper	plastics			timber	honeycomb	AFRP	GFRP / CFRP		graphite
		< 8 % Si	≥ 8 % Si	Cu-alloy	thermoplastics	elastomers	duroplasts	materials	sandwich	aramid	< 30 % fibre content	≥ 30 % fibre content	
								200-250		250-350			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	art.no.	€
6	20	60	6	250618 0060	80,40
8	22	63	8	250618 0080	105,-
10	25	72	10	250618 0100	135,50
12	30	83	12	250618 0120	174,-

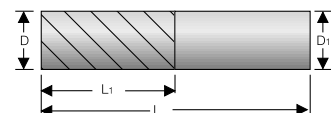
2168



## SARA® Contour cutter for GFRP and CFRP

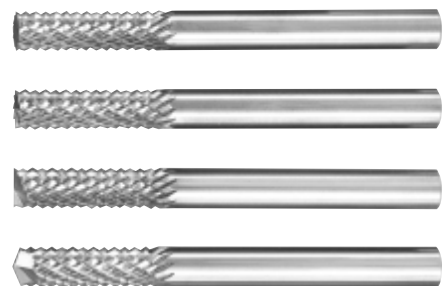


- Various versions
- Type A - smooth front face
- Type B - rotary cutter front face
- Type C - end mill front face
- Type D - drill point



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	alloys	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GFRP/CFRP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																200-230			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	D1 mm	Feed for side milling fz graphite mm/tooth	Type A art.no.	€	Type B art.no.	€	Type C art.no.	€	Type D art.no.	€
1.6	5	38	3	1000-1500	250050 0001	9,20	250051 0001	10,95	250052 0001	10,95	250053 0001	11,60
2.4	9.5	38	3	1100-1800	250050 0002	9,80	250051 0002	10,95	250052 0002	11,85	250053 0002	12,50
3.0	12	38	3	1100-1800	250050 0003	9,40	250051 0003	10,45	250052 0003	11,25	250053 0003	11,95
4.0	16	50	4	900-1700	250050 0004	15,30	250051 0004	17,-	250052 0004	17,70	250053 0004	17,80
4.0	16	50	6	900-1700	250050 0005	16,70	250051 0005	18,65	250052 0005	19,85	250053 0005	20,60
6.0	19	50	6	900-1700	250050 0007	16,70	250051 0007	18,65	250052 0007	19,85	250053 0007	20,60
6.0	19	63	6	900-1700	250050 0008	16,70	250051 0008	18,65	250052 0008	19,85	250053 0008	20,60
6.0	25	75	6	900-1700	250050 0009	20,60	250051 0009	22,40	250052 0009	23,50	250053 0009	24,30
8.0	25	63	8	900-1700	250050 0006	34,60	250051 0006	36,90	250052 0006	38,40	250053 0006	39,40
10.0	25	75	10	500-1300	250050 0010	43,10	250051 0010	46,70	250052 0010	48,70	250053 0010	50,50
12.0	25	75	12	500-1300	250050 0011	59,-	250051 0011	65,10	250052 0011	68,20	250053 0011	71,70

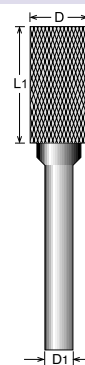
## ATORN® Carbide rotary burs

3D  
PRINT



792

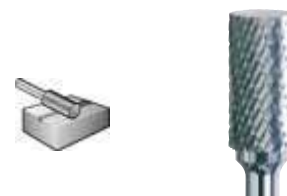
- Similar to DIN 8033
- Shank Ø 6 mm
- Solid carbide up to head Ø 6 mm, brazed from head Ø 8 mm
- Precision manufacturing on the latest CNC grinding machines guarantees exact and uniform cut with optimised cutting geometry
- For machining high-strength and tough materials as well as non-ferrous and lightweight metals
- Roughing and finishing on hand-operated machines
- Effective when used on stationary internal grinding machines and jig boring machines (milling and finish milling)



### ZYA - cylindrical shape without spur cut

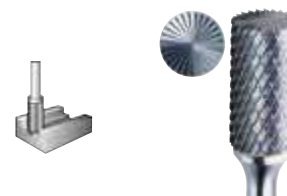


D mm	L1 mm	D1 mm	Cut 6		Cut 2		Aluminium cut	
			art.no.	€	art.no.	€	art.no.	€
6	18	6	605051 0618	17,70	608054 0618	17,70	608035 0618	22,80
8	20	6	605051 0820	22,50	608054 0820	22,50	608035 0820	31,80
10	20	6	605051 1020	24,20	608054 1020	24,20	608035 1020	30,30
12	25	6	605051 1225	37,80	608054 1225	37,80	608035 1225	47,20
15	25	6	605051 1525	47,50	608054 1525	47,50	608035 1525	59,50
			6108		6108		6108	



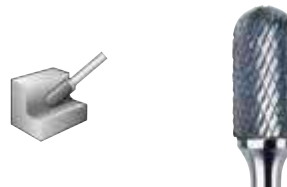
### ZYAS - cylindrical shape with spur cut

D mm	L1 mm	D1 mm	Cut 1		Aluminium cut	
			art.no.	€	art.no.	€
6	18	6	605001 0616	19,25		
8	20	6	605001 0819	24,80	608001 0819	31,80
10	20	6	605001 0919	26,40	608001 0919	43,40
12	25	6	605001 1225	41,40	608001 1225	59,50
15	25	6	605001 1625	67,70		
			6108		6108	



### WRC - radius end shape

D mm	L1 mm	D1 mm	Cut 6		Cut 2		Aluminium cut	
			art.no.	€	art.no.	€	art.no.	€
6	18	6	605005 0616	20,60	608006 0616	20,60		
8	20	6	605005 0819	24,60	608006 0819	24,60		
10	20	6	605005 0919	26,80	608006 0919	26,80	608005 0919 33,60	
12	25	6	605005 1225	42,50	608006 1225	42,50	608005 1225 52,90	
15	25	6	605005 1625	53,40	608006 1625	52,90	608005 1625 66,70	
			6108		6108		6108	



### KUD - ball shape

D mm	D1 mm	Cut 6		Cut 2		Aluminium cut	
		art.no.	€	art.no.	€	art.no.	€
5	6	605010 0530	20,90				
6	6	605010 0650	18,95	605013 0606	18,95	608010 0606	30,50
8	6	605010 0860	19,85	605013 0860	19,85		
10	6	605010 0980	21,70			608010 0906	27,60
12	6	605010 1211	29,80	605013 1211	29,-	608010 1206	37,30
15	6	605010 1614	37,-			608010 1606	46,10
		6108		6108		6108	



### TRE - drop shape

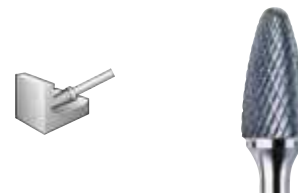
D mm	L1 mm	D1 mm	Cut 6		Cut 2		Aluminium cut	
			art.no.	€	art.no.	€	art.no.	€
6	10	6	605015 0609	22,50	605018 0609	22,50		
8	15	6	605015 0815	24,60	605018 0815	24,60		
10	15	6	605015 0916	26,80	605018 0916	26,80	608015 0916 37,70	
12	20	6	605015 1222	39,30	605018 1222	39,30	608015 1222 60,60	
15	25	6	605015 1625	54,50			608015 1625 76,80	
			6108		6108		6108	



Continued on next page >>>

**RBF - rounded arch shape**

D mm	L1 mm	D1 mm	Cut 6		Cut 2		Aluminium cut	
			art.no.	€	art.no.	€	art.no.	€
6	18	6	<b>605020</b> 0616	<b>22,10</b>	<b>608023</b> 0616	<b>22,10</b>		
8	20	6	605020 0820	<b>27,60</b>	608023 0820	<b>27,60</b>	<b>608020</b> 0820	<b>34,70</b>
10	20	6	605020 0919	<b>26,40</b>	608023 0919	<b>26,40</b>	608020 0919	<b>32,90</b>
12	25	6	605020 1225	<b>38,90</b>	608023 1225	<b>38,90</b>	608020 1225	<b>48,70</b>
15	25	6	605020 1625	<b>54,-</b>			608020 1625	<b>67,20</b>
20	25	6	605020 1925	<b>70,70</b>				
			6108		6108		6108	

**SPG - pointed arch shape**

D mm	L1 mm	D1 mm	Cut 6		Cut 2	
			art.no.	€	art.no.	€
6	18	6	<b>605025</b> 0616	<b>21,50</b>	<b>605028</b> 0616	<b>21,50</b>
8	20	6	605025 0819	<b>25,40</b>	605028 0819	<b>25,40</b>
10	20	6	605025 0919	<b>28,10</b>	605028 0919	<b>28,10</b>
12	25	6	605025 1219	<b>38,30</b>		
15	25	6	605025 1625	<b>53,40</b>	605028 1625	<b>53,40</b>
			6108		6108	

**H - flame shape**

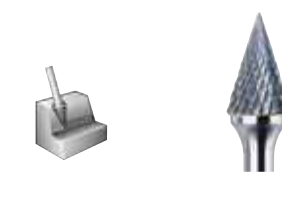
D mm	L1 mm	D1 mm	Cut 6		Cut 2	
			art.no.	€	art.no.	€
8	20	6	<b>605035</b> 0819	<b>27,60</b>	<b>605038</b> 0819	<b>27,60</b>
12	32	6	605035 1232	<b>56,50</b>	605038 1232	<b>56,50</b>
15	35	6	605035 1636	<b>95,10</b>		
			6108		6108	

**KEL - round taper**

D mm	L1 mm	D1 mm	Cut 6		Cut 2		Aluminium cut	
			art.no.	€	art.no.	€	art.no.	€
6	18	6	<b>605030</b> 0616	<b>21,50</b>	<b>608033</b> 0616	<b>21,50</b>		
8	22	6	605030 0822	<b>34,20</b>				
10	26	6	605030 0927	<b>33,70</b>	608033 0927	<b>33,70</b>	<b>608030</b> 0927	<b>47,40</b>
12	32	6	605030 1228	<b>41,10</b>	608033 1228	<b>41,10</b>	608030 1228	<b>51,40</b>
15	33	6	605030 1630	<b>80,90</b>	608033 1630	<b>80,90</b>	608030 1630	<b>101,50</b>
			6108		6108		6108	

**SKM - pointed taper**

D mm	L1 mm	D1 mm	Cut 6		Cut 2	
			art.no.	€	art.no.	€
6	20	6	<b>605040</b> 0619	<b>22,-</b>	<b>605043</b> 0619	<b>21,40</b>
10	20	6	605040 0916	<b>33,70</b>	605043 0916	<b>33,70</b>
12	25	6	605040 1222	<b>42,30</b>		
15	25	6	605040 1625	<b>56,50</b>	605043 1625	<b>56,50</b>
			6108		6108	

**WKN - angle milling cutter shape**

D mm	L1 mm	D1 mm	Cut 1		Cut 2	
			art.no.	€	art.no.	€
10	10	6	<b>605045</b> 0909	<b>29,80</b>	<b>605048</b> 0909	<b>29,80</b>
12	13	6	605045 1212	<b>42,10</b>	605048 1212	<b>42,10</b>
			6108		6108	

**Sets**

Contents	Cut 6	
	art.no.	€
5-pcs. in plastic box: ZYAS 12x25, WRC 12x25, KUD 12, RBF 12x25, SKM 12x25	<b>605083</b> 0005	<b>188,50</b>
10-pcs. in metal cartridge: ZYA 10x20, ZYA 12x25, WRC 10x20, WRC 12x25, KUD 12, TRE 10x15, RBF 12x25, SPG 10x20, SPG 12x25, KEL 12x28	605083 0010	<b>284,-</b>
6108		



605083 0005

605083 0010

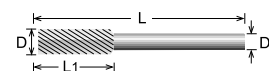
# ATORN® Carbide miniature burrs

3D  
PRINT

792

Up to a head Ø  
of 6 mm

- Similar to DIN 8033
- Shank Ø 3 mm



## ZYA - cylindrical shape without spur cut

D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
2	11	3	38			605502 0211	9,75
3	14	3	38	605501 0314	10,15		
6	12	3	42	605501 0612	17,-		
				6108		6108	



## ZYAS - cylindrical shape with spur cut

D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
2	11	3	38	605541 0211	11,30		
3	14	3	38	605541 0314	11,30	605544 0314	10,15
6	12	3	42	605541 0612	18,65	605544 0612	17,-
				6108		6108	



## WRC - radius end shape

D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
2	11	3	38	605505 0211	10,15	605508 0211	10,15
3	12	3	38	605505 0314	10,15	605508 0314	10,15
6	12	3	42	605505 0612	17,-	605508 0612	17,-
				6108		6108	



## KUD - ball shape

D mm	D1 mm	L mm	Cut 6		Cut 2	
			art.no.	€	art.no.	€
3	3	38	605510 0303	10,15		
6	3	38	605510 0306	17,-	605513 0306	17,-
			6108		6108	



## TRE - drop shape

D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
3	6	3	38	605515 0355	10,15	605518 0355	10,15
6	10	3	40	605515 0610	17,-	605518 0610	17,-
				6108		6108	



## RBF - rounded arch shape

D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
3	8	3	38	605520 0308	10,15	605523 0308	10,15
3	12	3	38	605520 0312	10,15	605523 0312	10,15
6	12	3	42	605520 0612	17,-	605523 0612	17,-
				6108		6108	



## SPG - pointed arch shape

D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
3	6	3	38	605525 0307	10,15	605524 0307	10,15
3	12	3	38	605525 0395	10,15	605524 0395	10,15
6	12	3	42	605525 0642	17,-	605524 0642	17,-
				6108		6108	



## KEL - round taper

D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
3	12	3	38	605525 0312	10,15	605534 0312	10,15
6	12	3	42	605525 0612	17,-	605534 0612	17,-
				6108		6108	



## SKM - pointed taper

D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
3	8	3	38	605530 0308	12,20	605533 0308	12,20
3	11	3	38	605530 0311	10,15	605533 0311	10,15
3	15	3	38	605530 0315	10,15	605533 0315	10,55
6	12	3	42	605530 0612	17,-	605533 0612	17,-
				6108		6108	



Continued on next page &gt;&gt;&gt;



**H - flame shape**

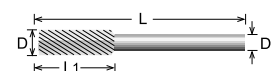
D mm	L1 mm	D1 mm	L mm	Cut 6		Cut 2	
				art.no.	€	art.no.	€
3	6	3	38	<b>605525</b> 0306	<b>10,15</b>	<b>605528</b> 0306	<b>10,15</b>
				6108		6108	

**Set**

Contents				Cut 6	
				art.no.	€
10-pcs. in plastic box: ZYA 2x14, ZYAS 3x14, WRC 3x12, KUD 3, TRE 3x6, RBF 3x12, H 3x6, SPG 3x12, KEL 3x12, SKM 3x12				<b>605583</b> 0010	<b>111,50</b>
				6108	

**ATORN® Carbide miniature burrs, extra-long**

• Shank Ø 3 mm

**ZYA - cylindrical shape**

D mm	L1 mm	D1 mm	L mm	Cut 6	
				art.no.	€
3	14	3	75	<b>606001</b> 0014	<b>20,30</b>
				6108	

**WRC - radius end shape**

D mm	L1 mm	D1 mm	L mm	Cut 6	
				art.no.	€
3	12	3	75	<b>606005</b> 0014	<b>20,30</b>
				6108	

**KUD - ball shape**

D mm	D1 mm	L mm	Cut 6	
			art.no.	€
3	3	75	<b>606010</b> 0003	<b>20,30</b>
			6108	

**TRE - drop shape**

D mm	L1 mm	D1 mm	L mm	Cut 6	
				art.no.	€
3	6	3	75	<b>606015</b> 0055	<b>20,30</b>
				6108	

**RBF - rounded arch shape**

D mm	L1 mm	D1 mm	L mm	Cut 6	
				art.no.	€
3	12	3	75	<b>606020</b> 0127	<b>20,30</b>
				6108	

**SPG - pointed arch shape**

D mm	L1 mm	D1 mm	L mm	Cut 6	
				art.no.	€
3	12	3	75	<b>606025</b> 0127	<b>20,30</b>
				6108	

**KEL - round taper**

D mm	L1 mm	D1 mm	L mm	Cut 6	
				art.no.	€
3	12	3	75	<b>606035</b> 0127	<b>20,30</b>
				6108	

**SKM - pointed taper**

D mm	L1 mm	D1 mm	L mm	Cut 6	
				art.no.	€
3	11	3	75	<b>606030</b> 0011	<b>20,30</b>
				6108	





## Carbide rotary cutter for fine machining



792

Carbide metal rotary cutters with **MICRO teeth** are specially designed for **fine cutting** and are used in areas where grinding points are normally used. They offer a higher cutting performance and produce a high-quality surface finish, particularly compared with conventional milled surfaces. At the same time, they are **low vibration and produce little noise**. They retain their geometry throughout their entire service life. They are ideally suited for machining tasks during manual and machine use.

### Advantages:

- High-quality surface finish
- No change in geometry due to wear and tear compared to grinding points
- Machining of almost all materials up to 68 HRC

### Machining tasks:

- Fine machining
- Very fine plaster work
- Corrections to tool and mould making
- Sharpening of cutting tools

### Machinable materials:

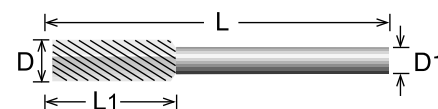
- Steel and cast steel
- Stainless steel (INOX)
- Non-ferrous metals
- Cast iron

### Recommendations for use:

- Where possible, use the tools on high-performance drives with flexibly-mounted spindles to avoid vibrations.
- To ensure the efficient use of rotary cutters, work at high rotational speeds/cutting speeds. Performance recommendation for tool drives:
  - Shank  $\varnothing$  3 mm: 75 to 300 watt
  - Shank  $\varnothing$  6 mm: from 300 watt
- Please observe the recommended speeds.

### Suitable tool drives:

- Flexible shaft drives, straight grinders, robot applications, tool machines



### ZYA shank 3 mm

D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
2	10	40	3	250031 0210	20,90
3	13	43	3	250031 0313	20,90
4	13	43	3	250031 0413	21,90
6	13	43	3	250031 0613	21,90

2177

### ZYA shank 6 mm

D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
6	16	55	6	250061 0616	25,60
8	20	60	6	250061 0820	34,20
10	20	60	6	250061 1020	39,—
12	25	65	6	250061 1225	49,80

2177

### ZYAS shank 6 mm

D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
6	16	55	6	250062 0616	28,—
8	20	60	6	250062 0820	37,60
10	20	60	6	250062 1020	42,80
12	25	65	6	250062 1225	54,80

2177

### KUD shank 3 mm

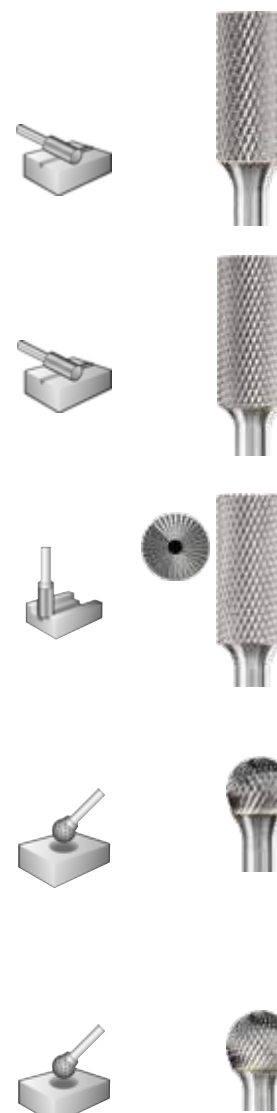
D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
2	1.5	33	3	250034 0215	18,95
3	2	33	3	250034 0302	18,95
4	3	34	3	250034 0403	19,85
6	5	35	3	250034 0605	19,85

2177

### KUD shank 6 mm

D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
6	5	45	6	250064 0605	24,—
8	7	47	6	250064 0807	27,50
10	9	49	6	250064 1009	31,30
12	10	51	6	250064 1210	39,—

2177

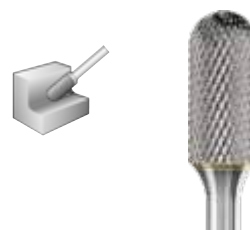


Continued on next page &gt;&gt;&gt;

## WRC shank 3 mm

D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
2	10	40	3	<b>250033</b> 0210	<b>23,20</b>
3	13	43	3	250033 0313	<b>23,20</b>
6	13	43	3	250033 0613	<b>24,40</b>

2177



## WRC shank 6 mm

D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
6	16	55	6	<b>250063</b> 0616	<b>28,50</b>
8	20	60	6	250063 0820	<b>40,-</b>
10	20	60	6	250063 1020	<b>45,20</b>
12	25	65	6	250063 1225	<b>61,30</b>

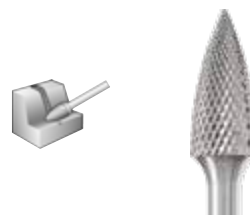
2177



## SPG shank 3 mm

D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
3	7	37	3	<b>250036</b> 0307	<b>23,20</b>
3	13	43	3	250036 0313	<b>23,20</b>
6	13	43	3	250036 0613	<b>24,40</b>

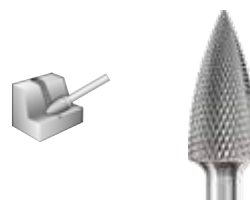
2177



## SPG shank 6 mm

D mm	L1 mm	L mm	D1 mm	MICRO	
				art.no.	€
6	18	55	6	<b>250066</b> 0618	<b>27,50</b>
8	20	60	6	250066 0820	<b>40,-</b>
10	20	60	6	250066 1020	<b>45,20</b>
12	25	65	6	250066 1225	<b>52,10</b>

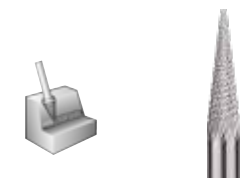
2177



## SKM shank 3 mm

D mm	L1 mm	L mm	D1 mm	α °	MICRO	
					art.no.	€
3	7	37	3	21°	<b>250037</b> 0307	<b>23,20</b>
3	11	41	3	14°	250037 0311	<b>23,20</b>
6	13	43	3	25°	250037 0613	<b>24,40</b>

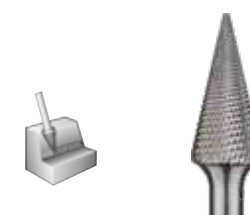
2177



## SKM shank 6 mm

D mm	L1 mm	L mm	D1 mm	α °	MICRO	
					art.no.	€
6	18	55	6	18°	<b>250067</b> 0618	<b>27,50</b>
8	20	60	6	22°	250067 0820	<b>30,40</b>
10	20	60	6	28°	250067 1020	<b>36,70</b>
12	25	65	6	26°	250067 1225	<b>51,-</b>

2177



## RBF shank 3 mm

D mm	L1 mm	L mm	D1 mm	r mm	MICRO	
					art.no.	€
3	7	37	3	0.75	<b>250035</b> 0307	<b>23,20</b>
3	13	43	3	0.75	250035 0313	<b>23,20</b>
6	13	43	3	1.5	250035 0613	<b>24,40</b>

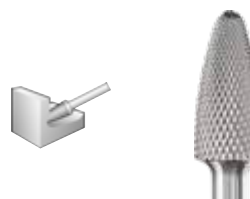
2177



## RBF shank 6 mm

D mm	L1 mm	L mm	D1 mm	r mm	MICRO	
					art.no.	€
6	18	55	6	1.5	<b>250065</b> 0618	<b>28,30</b>
8	20	60	6	1.2	250065 0820	<b>40,-</b>
10	20	60	6	2.5	250065 1020	<b>46,30</b>
12	25	65	6	2.5	250065 1225	<b>53,60</b>

2177



**ATORN® RockTec complete range for materials up to 52/65 HRC**

**INFO**

**Over 660 innovative solid carbide milling tools**

- For all instances of machining and usage, you now get a complete ATORN range of solid carbide end milling cutters, solid carbide torus milling cutters and solid carbide radius milling cutters.
- **Diameter range from Ø 0.1 – Ø 20 mm**
- The different geometries are matched to different milling operations.
- **Cutting material: solid carbide ultra-micrograin of high hardness and extreme toughness**

	Ø-range mm	RockTec 52	Page	RockTec 65	Page
Solid carbide miniature end milling cutters	Ø 0,1 - 0,9		555		555
Solid carbide miniature end milling cutters, long neck	Ø 0,2 - 3,0		556		557
Solid carbide miniature torus milling cutters, long neck	Ø 0,2 - 3,0		566		567
Solid carbide miniature radius milling cutters	Ø 0,2 - 0,9		573		573
Solid carbide miniature radius milling cutters, long neck	Ø 0,2 - 3,0		574		574
Solid carbide end milling cutters	Ø 3,0 - 20,0		558		558
Solid carbide end milling cutter with short cutting edge, long design	Ø 3,0 - 20,0		559		560
Solid carbide end milling cutter with short cutting edge, extra-long design	Ø 3,0 - 20,0		559		560
Solid carbide multi-flute milling cutters, standard design	Ø 3,0 - 20,0		562		563
Solid carbide multi-flute milling cutters, long design	Ø 3,0 - 20,0		562		563
Solid carbide multi-flute milling cutters, standard, Z7	Ø 3,0 - 20,0		564		565
Solid carbide multi-flute milling cutters, standard, Z7, Corner radius	Ø 3,0 - 20,0		564		565
Solid carbide torus milling cutters	Ø 3,0 - 20,0		568		569
Solid carbide torus milling cutter with short cutting edge, standard design	Ø 3,0 - 16,0		570		571
Solid carbide torus milling cutter with short cutting edge, long design	Ø 3,0 - 16,0		570		572
Solid carbide torus milling cutter with short cutting edge, extra-long design	Ø 3,0 - 16,0		571		572
Solid carbide radius milling cutters, short, Z 2	Ø 2,0 - 20,0		576		577
Solid carbide radius milling cutters, long, Z 2	Ø 2,0 - 20,0		576		577
Solid carbide radius milling cutters, extra-long, Z 2	Ø 2,0 - 20,0		576		577
Solid carbide radius milling cutters, short, Z 4	Ø 3,0 - 20,0		578		579
Solid carbide radius milling cutters, long, Z 4	Ø 3,0 - 20,0		578		579

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	●	<30 HRC	≥30 HRC	<8 % Si	≥8 % Si	Co-alloy	GNP/CFP/thermo.	<55 HRC	<60 HRC	≥60 HRC
RockTec 52	●	●	●	○	●	●	○	●	●	●	○	○					●	○	○
RockTec 65	○			○						○	○	○					○	○	○

**ATORN® RockTec Highest efficiency through new coatings****INFO**

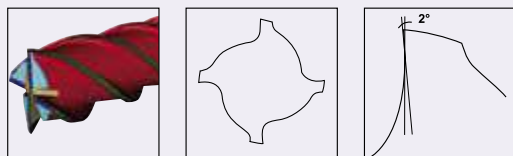
ATORN milling tools offer the best conditions for the efficient machining of materials up to 65 HRC. Through a special cutting-edge treatment, as well as the new coatings, you achieve the highest machining performance, precision and durability.

**RockTec 52**

Cutting material:	Ultra-superfine grain
Grain size:	0.005 mm
ISO quality:	K 10/K 40
Coating:	AlTiN (monolayer PVD)
Layer thickness:	2.5 ~ 3.5 µm
Micro-hardness:	(HV 0.05) 3,300
Application temperature:	≥ 900 °C
Friction coefficient:	0.25

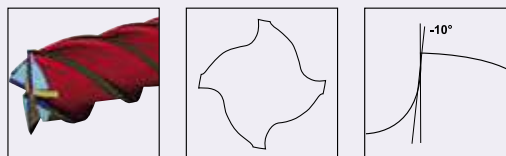
**RockTec 65**

Cutting material:	Ultra-superfine grain
Grain size:	0.005 mm
ISO quality:	K 10/K 40
Coating:	TiSi-based (multilayer PVD)
Layer thickness:	2.5 ~ 3.5 µm
Micro-hardness:	(HV 0.05) 3,600
Application temperature:	≥ 1,200 °C
Friction coefficient:	0.3

**Tools up to 52 HRc**

Example Solid carbide end milling cutters

Helix angle:	40°
Rake angle on the external Ø:	2°
Core diameter:	65%

**Tools up to 65 HRc**

Example Solid carbide end milling cutters

Helix angle:	40°
Rake angle on the external Ø:	-10°
Core diameter:	65%

**ATORN®****Advantages of hard machining**

Save on costs – boost efficiency with hard machining

HSC

HPC

**High flexibility**

- Hard machining can replace grinding and EDM in many cases

**Boost quality**

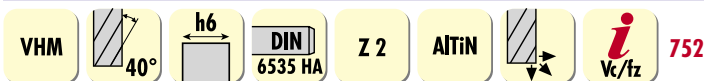
- No heat warping due to subsequent tempering
- High-quality surface finish

**Time savings**

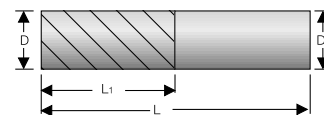
- Workpiece can be machined in one clamping procedure
- Fewer work-steps thanks to high machining volume

**Discover maximum quality in all areas of tool and mould manufacture.**

## ATORN® RockTec 52 mini end milling cutter



- Short, stable design for machining materials **up to 52 HRC**
- Cutting edge tolerance: at  $\varnothing$  0.1 - 0.7 mm = 0/- 0.012 mm, at  $\varnothing$  0.8 - 0.9 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		●	●	●	●	●	○	●	●	●	●	●					●		
		100-120	80-100	60-80	50-90	50-90	50-70	50-90	50-90	50-90	50-90	50-80					30-60		

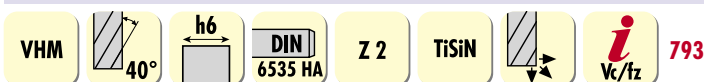
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1400 N/mm <sup>2</sup> mm/tooth	art.no.	€
0.1	0.2	40	4.0	0.005	257001 0001	21,60
0.2	0.4	40	4.0	0.005	257001 0002	21,60
0.3	0.6	40	4.0	0.005	257001 0003	21,60
0.4	0.8	40	4.0	0.009	257001 0004	21,60
0.5	1.0	40	4.0	0.009	257001 0005	21,60
0.6	1.2	40	4.0	0.009	257001 0006	21,60
0.7	1.4	40	4.0	0.009	257001 0007	21,60
0.8	1.6	40	4.0	0.009	257001 0008	21,60
0.9	1.8	40	4.0	0.013	257001 0009	21,60

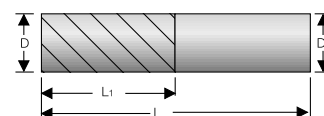
2146



## ATORN® RockTec 65 mini end milling cutter



- Short, stable design for machining materials **up to 65 HRC**
- Cutting edge tolerance: at  $\varnothing$  0.1 - 0.7 mm = 0/- 0.012 mm, at  $\varnothing$  0.8 - 0.9 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°~7°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				●						○	○	○					●	●	●
				60-100						15-80	15-80	13-65					50-90	50-90	40-80

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.1	0.2	40	4.0	0.002	257002 0001	27,10
0.2	0.4	40	4.0	0.002	257002 0002	27,10
0.3	0.6	40	4.0	0.002	257002 0003	27,10
0.4	0.8	40	4.0	0.002	257002 0004	27,10
0.5	1.0	40	4.0	0.002	257002 0005	27,10
0.6	1.2	40	4.0	0.002	257002 0006	27,10
0.7	1.4	40	4.0	0.002	257002 0007	27,10
0.8	1.6	40	4.0	0.002	257002 0008	27,10
0.9	1.8	40	4.0	0.006	257002 0009	27,10

2146

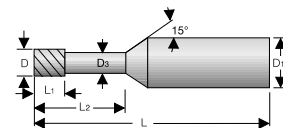




# ATORN® RockTec 52 mini end milling cutter

VHM
40°
h6
DIN 6535 HA
Z 2
AlTiN
3D PRINT
Vc/fz 752

- Long-necked version for machining materials **up to 52 HRC**
- Cutting edge tolerance: at Ø 0.1 - 0.7 mm = 0/- 0.012 mm, at Ø 0.8 - 3.0 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si			< 55 HRC	< 60 HRC	≥ 60 HRC
		100-120	80-100	60-80	50-90	50-90	50-70	50-90	50-90	50-90	50-90	50-90					30-60		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



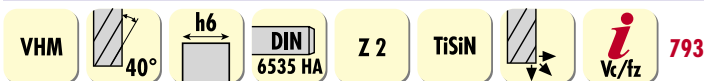
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
0.2	0.3	0.5	50	0.16	4.0	0.005	257009 0001	36,40
0.2	0.3	1.0	50	0.16	4.0	0.005	257009 0002	36,40
0.2	0.3	1.5	50	0.16	4.0	0.009	257009 0003	36,40
0.3	0.4	1.0	50	0.26	4.0	0.009	257009 0004	36,40
0.3	0.4	2.0	50	0.26	4.0	0.009	257009 0005	36,40
0.3	0.4	3.0	50	0.26	4.0	0.009	257009 0006	36,40
0.4	0.6	2.0	50	0.37	4.0	0.009	257009 0007	36,40
0.4	0.6	3.0	50	0.37	4.0	0.009	257009 0008	36,40
0.4	0.6	4.0	50	0.37	4.0	0.009	257009 0009	36,40
0.4	0.6	5.0	50	0.37	4.0	0.009	257009 0010	36,40
0.5	0.7	2.0	50	0.45	4.0	0.009	257009 0011	36,-
0.5	0.7	4.0	50	0.45	4.0	0.009	257009 0012	36,-
0.5	0.7	6.0	50	0.45	4.0	0.009	257009 0013	36,-
0.5	0.7	8.0	50	0.45	4.0	0.009	257009 0014	36,-
0.6	0.9	2.0	50	0.55	4.0	0.009	257009 0015	34,20
0.6	0.9	4.0	50	0.55	4.0	0.009	257009 0016	34,20
0.6	0.9	6.0	50	0.55	4.0	0.009	257009 0017	34,20
0.6	0.9	8.0	50	0.55	4.0	0.009	257009 0018	34,30
0.6	0.9	10.0	50	0.55	4.0	0.009	257009 0019	34,50
0.8	1.2	4.0	50	0.75	4.0	0.009	257009 0020	34,20
0.8	1.2	6.0	50	0.75	4.0	0.013	257009 0021	34,20
0.8	1.2	8.0	50	0.75	4.0	0.013	257009 0022	34,30
0.8	1.2	10.0	50	0.75	4.0	0.013	257009 0023	34,50
0.8	1.2	12.0	50	0.75	4.0	0.013	257009 0024	34,60
1.0	1.5	6.0	50	0.95	4.0	0.013	257009 0025	25,50
1.0	1.5	8.0	50	0.95	4.0	0.013	257009 0026	25,50
1.0	1.5	10.0	50	0.95	4.0	0.013	257009 0027	26,30

2146

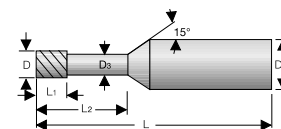
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
1.0	1.5	12.0	50	0.95	4.0	0.013	257009 0028	26,60
1.0	1.5	14.0	50	0.95	4.0	0.013	257009 0029	27,20
1.0	1.5	16.0	50	0.95	4.0	0.013	257009 0030	27,20
1.2	1.8	6.0	50	1.15	4.0	0.013	257009 0031	25,-
1.2	1.8	10.0	50	1.15	4.0	0.013	257009 0032	25,30
1.5	2.3	8.0	50	1.45	4.0	0.020	257009 0033	25,-
1.5	2.3	12.0	50	1.45	4.0	0.020	257009 0034	25,30
1.5	2.3	16.0	50	1.45	4.0	0.020	257009 0035	26,-
1.5	2.3	20.0	60	1.45	4.0	0.020	257009 0036	27,50
2.0	3.0	6.0	50	1.95	4.0	0.020	257009 0037	24,70
2.0	3.0	8.0	50	1.95	4.0	0.020	257009 0038	24,70
2.0	3.0	12.0	50	1.95	4.0	0.027	257009 0039	25,30
2.0	3.0	16.0	50	1.95	4.0	0.027	257009 0040	26,-
2.0	3.0	20.0	60	1.95	4.0	0.027	257009 0041	28,90
2.0	3.0	25.0	75	1.95	4.0	0.027	257009 0042	30,40
2.5	3.7	8.0	50	2.40	4.0	0.027	257009 0043	24,70
2.5	3.7	10.0	50	2.40	4.0	0.027	257009 0044	24,70
2.5	3.7	12.0	50	2.40	4.0	0.027	257009 0045	24,70
2.5	3.7	16.0	50	2.40	4.0	0.027	257009 0046	26,-
2.5	3.7	20.0	60	2.40	4.0	0.027	257009 0047	28,90
2.5	3.7	25.0	75	2.40	4.0	0.027	257009 0048	31,10
3.0	4.5	8.0	50	2.85	6.0	0.027	257009 0049	36,60
3.0	4.5	10.0	50	2.85	6.0	0.027	257009 0050	36,60
3.0	4.5	12.0	50	2.85	6.0	0.027	257009 0051	36,60
3.0	4.5	16.0	60	2.85	6.0	0.027	257009 0052	36,60
3.0	4.5	20.0	60	2.85	6.0	0.027	257009 0053	36,60
3.0	4.5	25.0	75	2.85	6.0	0.027	257009 0054	38,80

2146

# ATORN® RockTec 65 mini end milling cutter



- Long-necked version for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 - 0.7 mm = 0/- 0.012 mm, at Ø 0.8 - 3.0 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°~7°
- With clearance



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	○	< 30 HRC	≥ 30 HRC	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				60-100						○	○	○					●	●	●
		Cutting speed Vc m/min.			Please adjust these guidelines according to clamping operation and machine set-up.														



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.2	0.3	0.5	50	0.16	4.0	0.002	257010 0001	42,80
0.2	0.3	1.0	50	0.16	4.0	0.002	257010 0002	42,80
0.2	0.3	1.5	50	0.16	4.0	0.002	257010 0003	42,80
0.3	0.4	1.0	50	0.26	4.0	0.002	257010 0004	42,80
0.3	0.4	2.0	50	0.26	4.0	0.002	257010 0005	42,80
0.3	0.4	3.0	50	0.26	4.0	0.002	257010 0006	42,80
0.4	0.6	2.0	50	0.37	4.0	0.002	257010 0007	42,80
0.4	0.6	3.0	50	0.37	4.0	0.002	257010 0008	42,80
0.4	0.6	4.0	50	0.37	4.0	0.002	257010 0009	42,80
0.4	0.6	5.0	50	0.37	4.0	0.002	257010 0010	42,80
0.5	0.7	2.0	50	0.45	4.0	0.002	257010 0011	41,10
0.5	0.7	4.0	50	0.45	4.0	0.002	257010 0012	41,10
0.5	0.7	6.0	50	0.45	4.0	0.002	257010 0013	41,10
0.5	0.7	8.0	50	0.45	4.0	0.002	257010 0014	41,10
0.6	0.9	2.0	50	0.55	4.0	0.002	257010 0015	39,40
0.6	0.9	4.0	50	0.55	4.0	0.002	257010 0016	39,40
0.6	0.9	6.0	50	0.55	4.0	0.002	257010 0017	39,40
0.6	0.9	8.0	50	0.55	4.0	0.002	257010 0018	39,60
0.6	0.9	10.0	50	0.55	4.0	0.002	257010 0019	39,70
0.8	1.2	4.0	50	0.75	4.0	0.002	257010 0020	39,40
0.8	1.2	6.0	50	0.75	4.0	0.002	257010 0021	39,40
0.8	1.2	8.0	50	0.75	4.0	0.002	257010 0022	39,60
0.8	1.2	10.0	50	0.75	4.0	0.002	257010 0023	39,70
0.8	1.2	12.0	50	0.75	4.0	0.002	257010 0024	39,80
1.0	1.5	6.0	50	0.95	4.0	0.006	257010 0025	29,50
1.0	1.5	8.0	50	0.95	4.0	0.006	257010 0026	29,50
1.0	1.5	10.0	50	0.95	4.0	0.006	257010 0027	30,20

2146

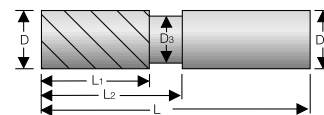
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
1.0	1.5	12.0	50	0.95	4.0	0.006	257010 0028	30,50
1.0	1.5	14.0	50	0.95	4.0	0.006	257010 0029	31,30
1.0	1.5	16.0	50	0.95	4.0	0.006	257010 0030	31,30
1.2	1.8	6.0	50	1.15	4.0	0.006	257010 0031	28,80
1.2	1.8	10.0	50	1.15	4.0	0.006	257010 0032	29,20
1.5	2.3	8.0	50	1.45	4.0	0.006	257010 0033	28,80
1.5	2.3	12.0	50	1.45	4.0	0.006	257010 0034	29,20
1.5	2.3	16.0	50	1.45	4.0	0.006	257010 0035	29,80
1.5	2.3	20.0	60	1.45	4.0	0.006	257010 0036	31,70
2.0	3.0	6.0	50	1.95	4.0	0.012	257010 0037	28,20
2.0	3.0	8.0	50	1.95	4.0	0.012	257010 0038	28,20
2.0	3.0	12.0	50	1.95	4.0	0.012	257010 0039	29,20
2.0	3.0	16.0	50	1.95	4.0	0.012	257010 0040	29,80
2.0	3.0	20.0	60	1.95	4.0	0.012	257010 0041	33,30
2.0	3.0	25.0	75	1.95	4.0	0.012	257010 0042	34,90
2.5	3.7	8.0	50	2.40	4.0	0.019	257010 0043	28,20
2.5	3.7	10.0	50	2.40	4.0	0.019	257010 0044	28,20
2.5	3.7	12.0	50	2.40	4.0	0.019	257010 0045	28,20
2.5	3.7	16.0	50	2.40	4.0	0.019	257010 0046	29,80
2.5	3.7	20.0	60	2.40	4.0	0.019	257010 0047	33,30
2.5	3.7	25.0	75	2.40	4.0	0.019	257010 0048	35,70
3.0	4.5	8.0	50	2.85	6.0	0.019	257010 0049	42,-
3.0	4.5	10.0	50	2.85	6.0	0.019	257010 0050	42,-
3.0	4.5	12.0	50	2.85	6.0	0.019	257010 0051	42,-
3.0	4.5	16.0	60	2.85	6.0	0.019	257010 0052	42,-
3.0	4.5	20.0	60	2.85	6.0	0.019	257010 0053	42,-
3.0	4.5	25.0	75	2.85	6.0	0.019	257010 0054	44,70

2146

## ATORN® RockTec 52 end milling cutter

VHM 758

- With clearance
- For machining materials **up to 52 HRC**
- Cutting edge tolerance: at Ø 3.0 - 20.0 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		●	●	●	●	●	○	●	●	●	●					●		
		140-160	130-150	120-140	100-120	100-120	80-100	100-120	100-120	80-100	80-100	70-90				60-80		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	9	15	50	2.8	6.0	0.02	257003 0030	28,90
4.0	12	20	50	3.7	6.0	0.02	257003 0040	28,90
5.0	15	20	50	4.6	6.0	0.03	257003 0050	28,90
6.0	16	20	50	5.5	6.0	0.03	257003 0060	28,90
8.0	20	30	64	7.4	8.0	0.04	257003 0080	45,60
10.0	22	32	70	9.2	10.0	0.05	257003 0100	61,60
12.0	25	37	75	11.0	12.0	0.06	257003 0120	70,20
16.0	32	46	90	15.0	16.0	0.08	257003 0160	123,50
20.0	38	58	100	19.0	20.0	0.1	257003 0200	168,-

Set

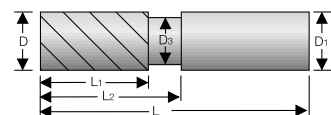
Contents		art.no.	€
Set, solid carbide 40°, Ø 6/8/10/12 mm, 4 cutting edges, RockTec 52		257003 0001	203,-



## ATORN® RockTec 65 end milling cutter

VHM 793

- With clearance
- For machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 3.0 - 20.0 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -6°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				●						○	○					●	●	●
				160-200						250-300	250-300	250-300				120-140	140-140	80-120

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	9	15	50	2.8	6.0	0.015	257004 0030	31,50
4.0	12	20	50	3.7	6.0	0.02	257004 0040	31,50
5.0	15	20	50	4.6	6.0	0.025	257004 0050	31,50
6.0	16	20	50	5.5	6.0	0.038	257004 0060	31,50
8.0	20	30	64	7.4	8.0	0.05	257004 0080	50,10
10.0	22	32	70	9.2	10.0	0.052	257004 0100	68,70
12.0	25	37	75	11.0	12.0	0.06	257004 0120	83,40
16.0	32	46	90	15.0	16.0	0.07	257004 0160	146,50
20.0	38	58	100	19.0	20.0	0.08	257004 0200	178,-

Set

Contents		art.no.	€
Set, solid carbide 40°, Ø 6/8/10/12 mm, 4 cutting edges, RockTec 65		257004 0001	224,-

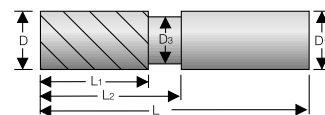


# ATORN® RockTec 52 end milling cutter



- With clearance
- For machining materials up to 52 HRC
- Cutting edge tolerance: at Ø 3.0 - 20.0 mm = 0/- 0.020 mm
- Cutting material: ultra-fine grain solid carbide
- Rake angle 3°

**Long neck**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GNP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
257005....	●	120-140	110-130	80-110	●	●	○	●	●	●	●	●					●		
257007....	●	100-120	90-110	80-100	●	●	○	●	●	●	●	●					●		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	5	30	75	2.8	6.0	0.02	257005 0030	40,90
4.0	8	32	75	3.7	6.0	0.02	257005 0040	40,90
5.0	9	32	75	4.6	6.0	0.03	257005 0050	40,90
6.0	10	40	75	5.5	6.0	0.03	257005 0060	40,90
8.0	12	40	75	7.4	8.0	0.04	257005 0080	52,40
10.0	14	60	100	9.2	10.0	0.05	257005 0100	80,40
12.0	16	60	100	11.0	12.0	0.06	257005 0120	93,60
16.0	22	85	125	15.0	16.0	0.08	257005 0160	140,50
20.0	26	85	125	19.0	20.0	0.1	257005 0200	265,-

2146



## Extra-long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	5	60	100	2.8	6.0	0.02	257007 0030	48,60
4.0	8	60	100	3.7	6.0	0.03	257007 0040	48,60
5.0	9	60	100	4.6	6.0	0.04	257007 0050	48,60
6.0	10	60	100	5.5	6.0	0.055	257007 0060	48,60
8.0	12	60	100	7.4	8.0	0.08	257007 0080	71,70
10.0	14	85	125	9.2	10.0	0.09	257007 0100	105,-
12.0	16	110	150	11.0	12.0	0.1	257007 0120	122,50
16.0	22	110	150	15.0	16.0	0.11	257007 0160	176,-
20.0	26	110	150	19.0	20.0	0.12	257007 0200	326,-

2146



Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



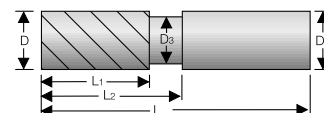
Register online now!

[www.saratools.com](http://www.saratools.com)

# ATORN® RockTec 65 end milling cutter

VHM
40°
e8
h6
DIN 6535 HA
Z 4
TiSiN
3D PRINT
i Vc/fz 794

- With clearance
- For machining materials up to 65 HRC
- Cutting edge tolerance: at Ø 3.0 - 20.0 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -6°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRC	< 60 HRC	≥ 60 HRC
257006....				140-160						○	○	○					●	●	●
257008....				120-140						○	○	○					●	●	●
		Cutting speed Vc m/min.			Please adjust these guidelines according to clamping operation and machine set-up.														

## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	5	30	75	2.8	6.0	0.015	257006 0030	46,30
4.0	8	32	75	3.7	6.0	0.02	257006 0040	46,30
5.0	9	32	75	4.6	6.0	0.025	257006 0050	46,30
6.0	10	40	75	5.5	6.0	0.035	257006 0060	46,30
8.0	12	40	75	7.4	8.0	0.05	257006 0080	59,-
10.0	14	60	100	9.2	10.0	0.055	257006 0100	91,60
12.0	16	60	100	11.0	12.0	0.06	257006 0120	106,-
16.0	22	85	125	15.0	16.0	0.07	257006 0160	159,-
20.0	26	85	125	19.0	20.0	0.08	257006 0200	280,-

2146







## Extra-long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	5	60	100	2.8	6.0	0.015	257008 0030	50,70
4.0	8	60	100	3.7	6.0	0.02	257008 0040	50,70
5.0	9	60	100	4.6	6.0	0.025	257008 0050	50,70
6.0	10	60	100	5.5	6.0	0.04	257008 0060	50,70
8.0	12	60	100	7.4	8.0	0.05	257008 0080	73,30
10.0	14	85	125	9.2	10.0	0.055	257008 0100	111,-
12.0	16	110	150	11.0	12.0	0.06	257008 0120	147,50
16.0	22	110	150	15.0	16.0	0.07	257008 0160	214,-
20.0	26	110	150	19.0	20.0	0.08	257008 0200	360,-

2146

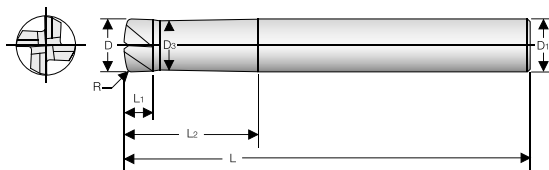


# ATORN® High feed-rate end milling cutter RockTec 65

VHM    Z 4 Z 6 TISIN  794

- 4-6 cutting edges
- For machining materials up to 65 HRC
- For copy and line milling
- Very high machining volumes are achieved with a special milling strategy
- Solid carbide ultra-fine grain cutting material

**High feed-rate milling cutter**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo	< 55 HRC	< 60 HRC	≥ 60 HRC
				●												●	●	●
				140-160												140-160	100-120	80-120

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Roughing cutter, standard

D	L1	L2	L	D1	R	D3	Z	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm		hardened steel ≥ 60 HRC mm/tooth		
4.0	1.5	8	57	6	0.4	3.7	4	0.028	257040 0001	76,30
4.0	1.5	15	57	6	0.4	3.7	4	0.028	257040 0002	76,30
5.0	2.0	10	57	6	0.5	4.6	4	0.035	257040 0003	76,30
5.0	2.0	21	57	6	0.5	4.6	4	0.035	257040 0004	76,30
6.0	2.5	12	57	6	0.6	5.5	4	0.045	257040 0005	76,30
6.0	2.5	26	57	6	0.6	5.5	4	0.045	257040 0006	76,30
8.0	3.0	16	63	8	0.8	7.4	6	0.060	257040 0007	110,-
8.0	3.0	31	63	8	0.8	7.4	6	0.060	257040 0008	110,-
10.0	3.5	20	72	10	1.0	9.2	6	0.070	257040 0009	165,-
10.0	3.5	36	72	10	1.0	9.2	6	0.070	257040 0010	165,-
12.0	4.0	24	83	12	1.2	11.0	6	0.080	257040 0011	204,-
12.0	4.0	41	83	12	1.2	11.0	6	0.080	257040 0012	204,-

2146



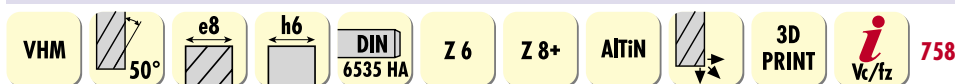
Precision ...

... but digital.

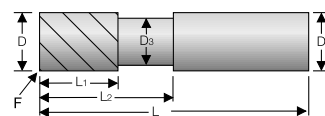
**ATORN®**  
Performance demands quality



# ATORN® RockTec 52 multi-flute milling cutter



- For machining materials **up to 52 HRC**
- Edge protection chamfer
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		●	●	●	●	●	○	●	●	●	●	●					●		
		140-160	130-150	120-140	100-120	100-120	80-100	100-120	100-120	80-100	80-100	70-90					60-80		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Standard

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	8	20	50	2.8	6.0	0.03	6	0.02	257011 0030	26,10
4.0	11	20	50	3.7	6.0	0.04	6	0.02	257011 0040	26,10
5.0	13	20	50	4.6	6.0	0.05	6	0.03	257011 0050	26,10
6.0	15	20	50	5.5	6.0	0.06	6	0.03	257011 0060	33,80
8.0	20	30	64	7.4	8.0	0.08	6	0.04	257011 0080	40,20
10.0	22	32	70	9.2	10.0	0.10	6	0.05	257011 0100	62,60
12.0	25	37	75	11.0	12.0	0.12	6	0.06	257011 0120	81,90
16.0	30	46	90	15.0	16.0	0.16	8	0.08	257011 0160	145,50
20.0	38	58	100	19.0	20.0	0.20	8	0.1	257011 0200	195,50



2146

## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	19	30	75	2.8	6.0	0.03	6	0.02	257013 0030	34,-
4.0	19	32	75	3.7	6.0	0.04	6	0.02	257013 0040	34,-
5.0	19	32	75	4.6	6.0	0.05	6	0.03	257013 0050	34,-
6.0	31	40	75	5.5	6.0	0.06	6	0.03	257013 0060	34,40
8.0	31	40	75	7.4	8.0	0.08	6	0.04	257013 0080	44,60
10.0	45	60	100	9.2	10.0	0.10	6	0.06	257013 0100	67,70
12.0	50	60	100	11.0	12.0	0.12	6	0.06	257013 0120	88,-
16.0	57	85	125	15.0	16.0	0.16	8	0.08	257013 0160	165,-
20.0	57	85	125	19.0	20.0	0.20	8	0.1	257013 0200	234,-



2146

## Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



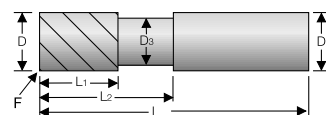
Register online now!

# www.saratools.com

# ATORN® RockTec 65 multi-flute milling cutter

VHM
50°
e8
h6
DIN 6535 HA
Z 6
Z 8+
TiSiN
i Vc/fz
793

- For machining materials **up to 65 HRC**
- Edge protection chamfer
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -26°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
257012....				160-200						250-300	250-300	250-300					120-140	140-140	80-120
257014....				140-160						200-260	200-260	200-260					100-130	100-130	70-100

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Standard

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	8	20	50	2.8	6.0	0.03	6	0.015	<b>257012 0030</b>	<b>32,30</b>
4.0	11	20	50	3.7	6.0	0.04	6	0.03	257012 0040	<b>32,30</b>
5.0	13	20	50	4.6	6.0	0.05	6	0.05	257012 0050	<b>32,30</b>
6.0	15	20	50	5.5	6.0	0.06	6	0.05	257012 0060	<b>41,80</b>
8.0	20	30	64	7.4	8.0	0.08	6	0.05	257012 0080	<b>49,70</b>
10.0	22	32	70	9.2	10.0	0.10	6	0.06	257012 0100	<b>77,30</b>
12.0	25	37	75	11.0	12.0	0.12	6	0.06	257012 0120	<b>101,50</b>
16.0	30	46	90	15.0	16.0	0.16	8	0.07	257012 0160	<b>182,50</b>
20.0	38	58	100	19.0	20.0	0.20	8	0.08	257012 0200	<b>224,-</b>

2146



## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	19	30	75	2.8	6.0	0.03	6	0.015	<b>257014 0030</b>	<b>36,80</b>
4.0	19	32	75	3.7	6.0	0.04	6	0.03	257014 0040	<b>36,80</b>
5.0	19	32	75	4.6	6.0	0.05	6	0.05	257014 0050	<b>36,80</b>
6.0	31	40	75	5.5	6.0	0.06	6	0.05	257014 0060	<b>38,90</b>
8.0	31	40	75	7.4	8.0	0.08	6	0.05	257014 0080	<b>47,30</b>
10.0	45	60	100	9.2	10.0	0.10	6	0.06	257014 0100	<b>75,30</b>
12.0	50	60	100	11.0	12.0	0.12	6	0.06	257014 0120	<b>103,-</b>
16.0	57	85	125	15.0	16.0	0.16	8	0.07	257014 0160	<b>192,50</b>
20.0	57	85	125	19.0	20.0	0.20	8	0.08	257014 0200	<b>290,-</b>

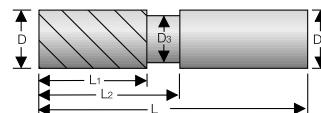
2146



## ATORN® Multi-flute milling cutter, sharp RockTec 52

VHM Typ H Z 6 Z 7 AlTiN **758**

- for machining materials **up to 52 HRC**
- sharp
- **Cutting material: ultra micro-grain SC**
- Rake angle 0 to -3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		●	●	●	●	●	○	●	●	●	●	●					●		
		140-160	120-140	130-150	100-120	100-120	80-100	100-120	100-120	80-100	80-100	70-90					60-80		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Standard

D	D1	D3	L	L1	L2	Z	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm		steel < 1400 N/mm² mm/tooth		
3	6	2.8	57	8	20	6	0.02	257041 0030	32,90
4	6	3.7	57	11	20	6	0.02	257041 0040	32,90
5	6	4.6	57	12	20	6	0.03	257041 0050	32,90
6	6	5.5	57	15	20	7	0.03	257041 0060	32,90
8	8	7.4	64	20	26	7	0.04	257041 0080	51,90
10	10	9.2	72	22	30	7	0.05	257041 0100	72,30
12	12	11	83	25	36	7	0.06	257041 0120	97,20
16	16	15	92	30	42	7	0.08	257041 0160	178,-
20	20	19	104	38	52	7	0.1	257041 0200	295,-

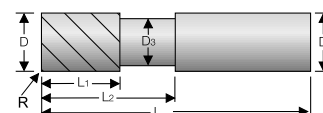
2146



## ATORN® Multi-flute milling cutter, corner radius RockTec 52

VHM Typ H Z 6 Z 7 AlTiN **758**

- For machining materials **up to 52 HRC**
- With corner radius
- **Solid carbide ultra-fine grain cutting material**
- Rake angle 0 to -3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		●	●	●	●	●	○	●	●	●	●	●					●		
		140-160	130-150	140-160	100-120	100-120	80-100	100-120	100-120	80-100	80-100	70-90					60-80		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

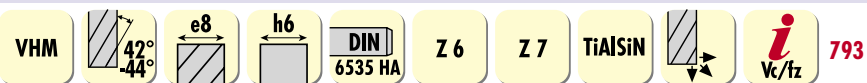
### Standard

D	D1	D3	L	L1	L2	R	Z	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm		steel < 1400 N/mm² mm/tooth		
3	6	2.8	57	8	20	0.2	6	0.02	257043 0001	32,-
4	6	3.7	57	11	20	0.2	6	0.02	257043 0002	33,80
5	6	4.6	57	12	20	0.3	6	0.03	257043 0003	45,20
6	6	5.5	57	15	20	0.5	7	0.03	257043 0004	48,30
6	6	5.5	57	15	20	1	7	0.03	257043 0005	48,30
8	8	7.4	63	20	26	0.5	7	0.04	257043 0006	73,80
8	8	7.4	63	20	26	0.8	7	0.04	257043 0007	73,80
10	10	9.2	72	22	30	0.5	7	0.05	257043 0008	93,10
10	10	9.2	72	22	30	0.8	7	0.05	257043 0009	93,10
10	10	9.2	72	22	30	1	7	0.05	257043 0010	93,10
12	12	11	83	25	36	0.5	7	0.06	257043 0011	125,50
12	12	11	83	25	36	1	7	0.06	257043 0012	125,50
12	12	11	83	25	36	1.5	7	0.06	257043 0013	126,50
16	16	15	92	30	42	2	7	0.08	257043 0014	203,-
16	16	15	92	30	42	3	7	0.08	257043 0015	204,-
20	20	19	104	38	52	3	7	0.1	257043 0016	326,-

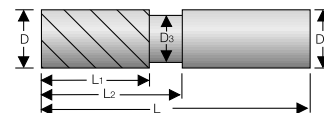
2146



## ATORN® Multi-flute milling cutter, sharp RockTec 65



- for machining materials up to 65 HRC
- sharp
- **Cutting material: ultra micro-grain SC**
- Rake angle 0 to -3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				140-160													80-110	80-110	50-80
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																			

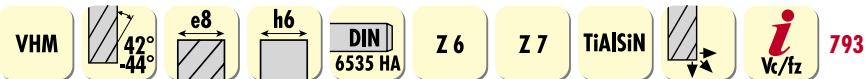
### Standard

D	D1	D3	L	L1	L2	Z	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm		hardened steel < 60 HRC mm/tooth		
3.0	6	2.8	57	8	20	6	0.015	257042 0030	41,10
4.0	6	3.7	57	11	20	6	0.03	257042 0040	41,10
5.0	6	4.6	57	12	20	6	0.05	257042 0050	41,10
6.0	6	5.5	57	15	20	7	0.05	257042 0060	41,10
8.0	8	7.4	64	20	26	7	0.05	257042 0080	65,10
10.0	10	9.2	72	22	30	7	0.06	257042 0100	90,60
12.0	12	11	83	25	36	7	0.06	257042 0120	121,50
16.0	16	15	92	30	42	7	0.07	257042 0160	224,-
20.0	20	19	104	38	52	7	0.08	257042 0200	375,-

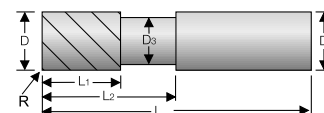
2146



## ATORN® Multi-flute milling cutter, corner radius RockTec 65



- for machining materials up to 65 HRC
- sharp
- **Cutting material: ultra micro-grain SC**
- Rake angle 0 to -3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				160-200						250-300	250-300	250-300					120-140	140-140	80-120
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																			

### Standard

D	D1	D3	L	L1	L2	R	Z	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm		hardened steel < 60 HRC mm/tooth		
3.0	6	2.8	57	8	20	0.2	6	0.02	257044 0001	39,90
4.0	6	3.7	57	11	20	0.2	6	0.02	257044 0002	42,30
5.0	6	4.6	57	12	20	0.3	6	0.03	257044 0003	56,50
6.0	6	5.5	57	15	20	0.5	7	0.03	257044 0004	60,10
6.0	6	5.5	57	15	20	1	7	0.03	257044 0005	60,10
8.0	8	7.4	63	20	26	0.5	7	0.04	257044 0006	92,10
8.0	8	7.4	63	20	26	0.8	7	0.04	257044 0007	92,10
10.0	10	9.2	72	22	30	0.5	7	0.05	257044 0008	116,-
10.0	10	9.2	72	22	30	0.8	7	0.05	257044 0009	116,-
10.0	10	9.2	72	22	30	1	7	0.05	257044 0010	116,-
12.0	12	11	83	25	36	0.5	7	0.06	257044 0011	156,-
12.0	12	11	83	25	36	1	7	0.06	257044 0012	156,-
12.0	12	11	83	25	36	1.5	7	0.06	257044 0013	158,-
16.0	16	15	92	30	42	2	7	0.08	257044 0014	255,-
16.0	16	15	92	30	42	3	7	0.08	257044 0015	255,-
20.0	20	19	104	38	52	3	7	0.1	257044 0016	410,-

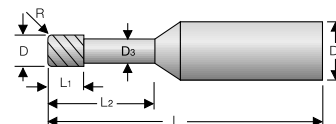
2146



# ATORN® RockTec 52 mini torus cutter

VHM **752**

- Long-necked version for machining materials **up to 52 HRC**
- Cutting edge tolerance: at Ø 0.1 - 0.7 mm = 0/- 0.012 mm, at Ø 0.8 - 3.0 mm = 0/- 0.020 mm
- Radius tolerance: 0/0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si			< 55 HRC	< 60 HRC	≥ 60 HRC
		100-120	80-100	60-80	50-90	50-90	50-70	50-90	50-90	50-90	50-90	50-80					30-60		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
0.2	0.3	0.5	50	0.16	4.0	0.02	0.005	257023 0001	50,30
0.2	0.3	1.0	50	0.16	4.0	0.02	0.005	257023 0002	50,30
0.2	0.3	1.5	50	0.16	4.0	0.02	0.005	257023 0003	50,30
0.3	0.4	1.0	50	0.26	4.0	0.03	0.005	257023 0004	47,-
0.3	0.4	2.0	50	0.26	4.0	0.03	0.005	257023 0005	47,-
0.3	0.4	3.0	50	0.26	4.0	0.03	0.005	257023 0006	47,-
0.4	0.6	2.0	50	0.37	4.0	0.03	0.0085	257023 0007	43,90
0.4	0.6	3.0	50	0.37	4.0	0.03	0.0085	257023 0008	43,90
0.4	0.6	4.0	50	0.37	4.0	0.03	0.0085	257023 0009	43,90
0.4	0.6	5.0	50	0.37	4.0	0.03	0.0085	257023 0010	43,90
0.5	0.7	2.0	50	0.45	4.0	0.05	0.0085	257023 0011	41,50
0.5	0.7	4.0	50	0.45	4.0	0.05	0.0085	257023 0012	41,50
0.5	0.7	6.0	50	0.45	4.0	0.05	0.0085	257023 0013	41,50
0.5	0.7	8.0	50	0.45	4.0	0.05	0.0085	257023 0014	41,50
0.6	0.9	2.0	50	0.55	4.0	0.05	0.0085	257023 0015	39,80
0.6	0.9	4.0	50	0.55	4.0	0.05	0.0085	257023 0016	39,80
0.6	0.9	6.0	50	0.55	4.0	0.05	0.0085	257023 0017	39,80
0.6	0.9	8.0	50	0.55	4.0	0.05	0.0085	257023 0018	39,80
0.6	0.9	10.0	50	0.55	4.0	0.05	0.0085	257023 0019	39,80
0.8	1.2	4.0	50	0.75	4.0	0.08	0.0085	257023 0020	39,80
0.8	1.2	6.0	50	0.75	4.0	0.08	0.0085	257023 0021	39,80
0.8	1.2	8.0	50	0.75	4.0	0.08	0.0085	257023 0022	39,80
0.8	1.2	10.0	50	0.75	4.0	0.08	0.0085	257023 0023	39,80
0.8	1.2	12.0	50	0.75	4.0	0.08	0.0085	257023 0024	39,80
1.0	1.5	6.0	50	0.95	4.0	0.10	0.013	257023 0025	38,80
1.0	1.5	8.0	50	0.95	4.0	0.10	0.013	257023 0026	38,80
1.0	1.5	10.0	50	0.95	4.0	0.10	0.013	257023 0027	38,80

2146

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
1.0	1.5	12.0	50	0.95	4.0	0.10	0.013	257023 0028	38,80
1.0	1.5	14.0	50	0.95	4.0	0.10	0.013	257023 0029	38,80
1.0	1.5	16.0	50	0.95	4.0	0.10	0.013	257023 0030	38,80
1.2	1.8	6.0	50	1.15	4.0	0.10	0.013	257023 0031	38,80
1.2	1.8	10.0	50	1.15	4.0	0.10	0.013	257023 0032	38,80
1.5	2.3	8.0	50	1.45	4.0	0.15	0.013	257023 0033	38,80
1.5	2.3	12.0	50	1.45	4.0	0.15	0.013	257023 0034	38,80
1.5	2.3	16.0	50	1.45	4.0	0.15	0.013	257023 0035	38,80
1.5	2.3	20.0	60	1.45	4.0	0.15	0.013	257023 0036	41,10
2.0	3.0	6.0	50	1.95	4.0	0.20	0.0195	257023 0037	38,80
2.0	3.0	8.0	50	1.95	4.0	0.20	0.0195	257023 0038	38,80
2.0	3.0	12.0	50	1.95	4.0	0.20	0.0195	257023 0039	38,80
2.0	3.0	16.0	50	1.95	4.0	0.20	0.0195	257023 0040	38,80
2.0	3.0	20.0	60	1.95	4.0	0.20	0.0195	257023 0041	40,80
2.0	3.0	25.0	75	1.95	4.0	0.20	0.0195	257023 0042	44,90
2.5	3.7	8.0	50	2.40	4.0	0.30	0.0265	257023 0043	38,80
2.5	3.7	10.0	50	2.40	4.0	0.30	0.0265	257023 0044	38,80
2.5	3.7	12.0	50	2.40	4.0	0.30	0.0265	257023 0045	38,80
2.5	3.7	16.0	50	2.40	4.0	0.30	0.0265	257023 0046	38,80
2.5	3.7	20.0	60	2.40	4.0	0.30	0.0265	257023 0047	41,10
2.5	3.7	25.0	75	2.40	4.0	0.30	0.0265	257023 0048	38,80
3.0	4.5	8.0	50	2.85	6.0	0.30	0.0265	257023 0049	42,80
3.0	4.5	10.0	50	2.85	6.0	0.30	0.0265	257023 0050	42,80
3.0	4.5	12.0	50	2.85	6.0	0.30	0.0265	257023 0051	42,80
3.0	4.5	16.0	60	2.85	6.0	0.30	0.0265	257023 0052	42,80
3.0	4.5	20.0	60	2.85	6.0	0.30	0.0265	257023 0053	42,80
3.0	4.5	25.0	75	2.85	6.0	0.30	0.0265	257023 0054	45,40

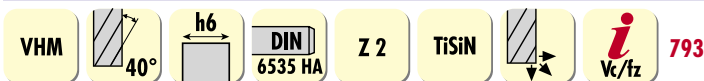
2146

Over 200,000 tools available online!  
Register online now!

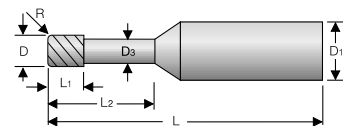
www.saratools.com



# ATORN® RockTec 65 mini torus cutter



- Long-necked version for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 - 0.7 mm = 0/- 0.012 mm, at Ø 0.8 - 3.0 mm = 0/- 0.020 mm
- Radius tolerance: 0/0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°~7°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				60-100						15-80	15-80	13-65					50-90	50-90	40-80

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D	L1	L2	L	D3	D1	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	hardened steel ≥ 60 HRC mm/tooth		
0.2	0.3	0.5	50	0.16	4.0	0.02	0.002	257024 0001	60,10
0.2	0.3	1.0	50	0.16	4.0	0.02	0.002	257024 0002	60,10
0.2	0.3	1.5	50	0.16	4.0	0.02	0.002	257024 0003	60,10
0.3	0.4	1.0	50	0.26	4.0	0.03	0.002	257024 0004	56,50
0.3	0.4	2.0	50	0.26	4.0	0.03	0.002	257024 0005	56,50
0.3	0.4	3.0	50	0.26	4.0	0.03	0.002	257024 0006	56,50
0.4	0.6	2.0	50	0.37	4.0	0.03	0.002	257024 0007	53,40
0.4	0.6	3.0	50	0.37	4.0	0.03	0.002	257024 0008	53,40
0.4	0.6	4.0	50	0.37	4.0	0.03	0.002	257024 0009	53,40
0.4	0.6	5.0	50	0.37	4.0	0.03	0.002	257024 0010	53,40
0.5	0.7	2.0	50	0.45	4.0	0.05	0.002	257024 0011	44,30
0.5	0.7	4.0	50	0.45	4.0	0.05	0.002	257024 0012	44,30
0.5	0.7	6.0	50	0.45	4.0	0.05	0.002	257024 0013	44,30
0.5	0.7	8.0	50	0.45	4.0	0.05	0.002	257024 0014	44,30
0.6	0.9	2.0	50	0.55	4.0	0.05	0.002	257024 0015	44,30
0.6	0.9	4.0	50	0.55	4.0	0.05	0.002	257024 0016	44,30
0.6	0.9	6.0	50	0.55	4.0	0.05	0.002	257024 0017	44,30
0.6	0.9	8.0	50	0.55	4.0	0.05	0.002	257024 0018	44,30
0.6	0.9	10.0	50	0.55	4.0	0.05	0.002	257024 0019	45,-
0.8	1.2	4.0	50	0.75	4.0	0.08	0.002	257024 0020	42,60
0.8	1.2	6.0	50	0.75	4.0	0.08	0.002	257024 0021	45,70
0.8	1.2	8.0	50	0.75	4.0	0.08	0.002	257024 0022	45,70
0.8	1.2	10.0	50	0.75	4.0	0.08	0.002	257024 0023	45,70
0.8	1.2	12.0	50	0.75	4.0	0.08	0.002	257024 0024	45,70
1.0	1.5	6.0	50	0.95	4.0	0.10	0.006	257024 0025	45,70
1.0	1.5	8.0	50	0.95	4.0	0.10	0.006	257024 0026	45,70
1.0	1.5	10.0	50	0.95	4.0	0.10	0.006	257024 0027	45,70

2146

D	L1	L2	L	D3	D1	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	hardened steel ≥ 60 HRC mm/tooth		
1.0	1.5	12.0	50	0.95	4.0	0.10	0.006	257024 0028	45,70
1.0	1.5	14.0	50	0.95	4.0	0.10	0.006	257024 0029	45,70
1.0	1.5	16.0	50	0.95	4.0	0.10	0.006	257024 0030	45,70
1.2	1.8	6.0	50	1.15	4.0	0.10	0.006	257024 0031	46,-
1.2	1.8	10.0	50	1.15	4.0	0.10	0.006	257024 0032	46,-
1.5	2.3	8.0	50	1.45	4.0	0.15	0.006	257024 0033	46,-
1.5	2.3	12.0	50	1.45	4.0	0.15	0.006	257024 0034	46,-
1.5	2.3	16.0	50	1.45	4.0	0.15	0.006	257024 0035	46,-
1.5	2.3	20.0	60	1.45	4.0	0.15	0.006	257024 0036	46,-
2.0	3.0	6.0	50	1.95	4.0	0.20	0.012	257024 0037	46,-
2.0	3.0	8.0	50	1.95	4.0	0.20	0.012	257024 0038	46,-
2.0	3.0	12.0	50	1.95	4.0	0.20	0.012	257024 0039	46,-
2.0	3.0	16.0	50	1.95	4.0	0.20	0.012	257024 0040	46,-
2.0	3.0	20.0	60	1.95	4.0	0.20	0.012	257024 0041	46,-
2.0	3.0	25.0	75	1.95	4.0	0.20	0.012	257024 0042	46,-
2.5	3.7	8.0	50	2.40	4.0	0.30	0.0185	257024 0043	47,10
2.5	3.7	10.0	50	2.40	4.0	0.30	0.0185	257024 0044	47,10
2.5	3.7	12.0	50	2.40	4.0	0.30	0.0185	257024 0045	47,10
2.5	3.7	16.0	50	2.40	4.0	0.30	0.0185	257024 0046	47,10
2.5	3.7	20.0	60	2.40	4.0	0.30	0.0185	257024 0047	47,10
2.5	3.7	25.0	75	2.40	4.0	0.30	0.0185	257024 0048	47,10
3.0	4.5	8.0	50	2.85	6.0	0.30	0.0185	257024 0049	48,90
3.0	4.5	10.0	50	2.85	6.0	0.30	0.0185	257024 0050	48,90
3.0	4.5	12.0	50	2.85	6.0	0.30	0.0185	257024 0051	48,90
3.0	4.5	16.0	60	2.85	6.0	0.30	0.0185	257024 0052	48,90
3.0	4.5	20.0	60	2.85	6.0	0.30	0.0185	257024 0053	48,90
3.0	4.5	25.0	75	2.85	6.0	0.30	0.0185	257024 0054	48,90

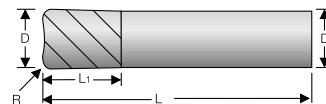
2146



# ATORN® RockTec 52 torus cutter

VHM
40°
e8
h6
DIN 6535 HA
Z 4
AlTiN
Vc/fz
758

- For machining materials **up to 52 HRC**
- Radius tolerance: 0/0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		● 140-160	● 130-150	● 120-140	● 100-120	● 100-120	○ 80-100	● 100-120	● 100-120	● 80-100	● 80-100	● 70-90					● 60-80		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	R mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	9	50	6.0	0.3	0.02	<b>257015 0001</b>	43,-
3.0	9	50	6.0	0.5	0.02	257015 0002	43,-
4.0	12	50	6.0	0.3	0.02	257015 0003	43,-
4.0	12	50	6.0	0.5	0.02	257015 0004	43,-
4.0	12	50	6.0	1.0	0.02	257015 0005	43,-
5.0	15	50	6.0	0.3	0.03	257015 0027	43,30
5.0	15	50	6.0	0.5	0.03	257015 0006	43,30
5.0	15	50	6.0	1.0	0.03	257015 0007	43,30
6.0	20	60	6.0	0.3	0.03	257015 0008	44,30
6.0	20	60	6.0	0.5	0.03	257015 0009	44,30
6.0	20	60	6.0	1.0	0.03	257015 0010	44,30
8.0	20	64	8.0	0.5	0.04	257015 0011	49,40
8.0	20	64	8.0	1.0	0.04	257015 0012	49,40
8.0	20	64	8.0	1.5	0.04	257015 0013	49,40
8.0	20	64	8.0	2.0	0.04	257015 0014	49,40
10.0	22	75	10.0	0.5	0.05	257015 0015	58,50
10.0	22	75	10.0	1.0	0.05	257015 0028	58,50
10.0	22	75	10.0	1.5	0.05	257015 0016	58,50
10.0	22	75	10.0	2.0	0.05	257015 0017	58,50
12.0	25	75	12.0	1.0	0.06	257015 0018	92,60
12.0	25	75	12.0	2.0	0.06	257015 0019	92,60
12.0	25	75	12.0	3.0	0.06	257015 0020	92,60
16.0	32	90	16.0	1.0	0.08	257015 0021	138,50
16.0	32	90	16.0	2.0	0.08	257015 0022	141,50
16.0	32	90	16.0	3.0	0.08	257015 0023	142,50
20.0	38	100	20.0	1.0	0.1	257015 0024	219,-
20.0	38	100	20.0	2.0	0.1	257015 0025	219,-
20.0	38	100	20.0	3.0	0.1	257015 0026	224,-



2146



Precision ...

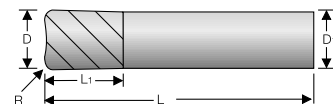
... but digital.

**ATORN®**  
Performance demands quality

# ATORN® Torus milling cutter RockTec 65

VHM
40°
e8
h6
DIN 6535 HA
Z 4
TiSiN
i Vc/fz 793

- Long-necked version for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 - 0.7 mm = 0/- 0.012 mm, at Ø 0.8 - 3.0 mm = 0/- 0.020 mm
- Radius tolerance: 0/0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°~7°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
				160-200						250-300	250-300	250-300				120-140	140-140	80-120	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	9	50	6.0	0.3	0.015	257016 0001	43,10
3.0	9	50	6.0	0.5	0.015	257016 0002	43,10
4.0	12	50	6.0	0.3	0.015	257016 0003	43,10
4.0	12	50	6.0	0.5	0.015	257016 0004	43,10
4.0	12	50	6.0	1.0	0.015	257016 0005	43,10
5.0	15	50	6.0	0.3	0.025	257016 0027	43,70
5.0	15	50	6.0	0.5	0.025	257016 0006	42,70
5.0	15	50	6.0	1.0	0.025	257016 0007	42,70
6.0	20	60	6.0	0.3	0.025	257016 0008	49,40
6.0	20	60	6.0	0.5	0.025	257016 0009	49,40
6.0	20	60	6.0	1.0	0.025	257016 0010	49,40
8.0	20	64	8.0	0.5	0.05	257016 0011	55,-
8.0	20	64	8.0	1.0	0.05	257016 0012	55,-
8.0	20	64	8.0	1.5	0.05	257016 0013	55,-
8.0	20	64	8.0	2.0	0.05	257016 0014	55,-
10.0	22	75	10.0	0.5	0.05	257016 0015	70,20
10.0	22	75	10.0	1.0	0.05	257016 0028	70,20
10.0	22	75	10.0	1.5	0.05	257016 0016	70,20
10.0	22	75	10.0	2.0	0.05	257016 0017	70,20
12.0	25	75	12.0	1.0	0.06	257016 0018	109,-
12.0	25	75	12.0	2.0	0.06	257016 0019	109,-
12.0	25	75	12.0	3.0	0.06	257016 0020	109,-
16.0	32	90	16.0	1.0	0.07	257016 0021	165,-
16.0	32	90	16.0	2.0	0.07	257016 0022	165,-
16.0	32	90	16.0	3.0	0.07	257016 0023	165,-
20.0	38	100	20.0	1.0	0.08	257016 0024	245,-
20.0	38	100	20.0	2.0	0.08	257016 0025	245,-
20.0	38	100	20.0	3.0	0.08	257016 0026	245,-



2146



High-gloss polished...

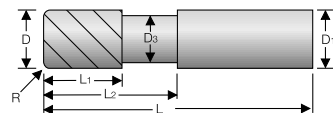
... extremely sharp.

**ATORN®**  
Performance demands quality

# ATORN® RockTec 52 torus cutter

VHM
40°
e8
h6
DIN 6535 HA
Z 4
AlTiN
3D PRINT
i Vc/fz
758

- With clearance
- For machining materials up to 52 HRC
- Radius tolerance: 0/-0.01 mm
- Cutting material: ultra-fine grain solid carbide
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si			< 55 HRC	< 60 HRC	≥ 60 HRC
257017....	●	140-160	130-150	120-140	●	●	●	●	●	●	●	●					●		
257019....	●	120-140	110-130	80-110	●	●	○	●	●	●	●	●					●		
257021....	●	100-120	90-110	80-100	●	●	○	●	●	●	●	●					●		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Standard

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	4	14	60	2.8	6.0	0.3	0.02	257017 0001	32,50
3.0	4	14	60	2.8	6.0	0.5	0.02	257017 0002	32,50
4.0	5	16	60	3.7	6.0	0.3	0.02	257017 0003	34,60
4.0	5	16	60	3.7	6.0	0.5	0.02	257017 0004	34,60
5.0	6	18	60	4.6	6.0	0.3	0.03	257017 0005	37,90
5.0	6	18	60	4.6	6.0	0.5	0.03	257017 0006	37,90
6.0	7	20	60	5.5	6.0	0.5	0.03	257017 0007	42,90
6.0	7	20	60	5.5	6.0	1.0	0.03	257017 0008	42,90
8.0	9	26	64	7.4	8.0	0.5	0.04	257017 0009	52,90
8.0	9	26	64	7.4	8.0	1.0	0.04	257017 0010	52,90
10.0	11	31	70	9.2	10.0	1.0	0.05	257017 0011	73,30
10.0	11	31	70	9.2	10.0	2.0	0.05	257017 0012	73,30
12.0	13	37	75	11.0	12.0	1.0	0.06	257017 0013	96,20
12.0	13	37	75	11.0	12.0	2.0	0.06	257017 0014	96,20
16.0	17	43	90	15.0	16.0	1.0	0.08	257017 0015	157,-
16.0	17	43	90	15.0	16.0	2.0	0.08	257017 0016	157,-



2146

## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	5	30	75	2.8	6.0	0.3	0.02	257019 0001	40,20
3.0	5	30	75	2.8	6.0	0.5	0.02	257019 0002	40,20
4.0	8	32	75	3.7	6.0	0.3	0.02	257019 0003	40,20
4.0	8	32	75	3.7	6.0	0.5	0.02	257019 0004	40,20
5.0	9	32	75	4.6	6.0	0.3	0.03	257019 0005	40,20
5.0	9	32	75	4.6	6.0	0.5	0.03	257019 0006	40,20
6.0	10	40	75	5.5	6.0	0.5	0.03	257019 0007	45,60
6.0	10	40	75	5.5	6.0	1.0	0.03	257019 0008	45,60
8.0	12	40	75	7.4	8.0	0.5	0.04	257019 0009	62,10
8.0	12	40	75	7.4	8.0	1.0	0.04	257019 0010	62,10
10.0	14	60	100	9.2	10.0	1.0	0.05	257019 0011	86,-
10.0	14	60	100	9.2	10.0	2.0	0.05	257019 0012	86,-
12.0	16	60	100	11.0	12.0	1.0	0.06	257019 0013	105,-
12.0	16	60	100	11.0	12.0	2.0	0.06	257019 0014	105,-
16.0	22	85	125	15.0	16.0	1.0	0.08	257019 0015	195,50
16.0	22	85	125	15.0	16.0	2.0	0.08	257019 0016	195,50



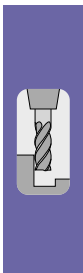
2146

Extra-long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz steel < 1400 N/mm <sup>2</sup> mm/tooth	art.no.	€
3.0	5	60	100	2.8	6.0	0.3	0.02	257021 0001	52,90
3.0	5	60	100	2.8	6.0	0.5	0.02	257021 0002	52,90
4.0	8	60	100	3.7	6.0	0.3	0.03	257021 0003	57,50
4.0	8	60	100	3.7	6.0	0.5	0.03	257021 0004	57,50
5.0	9	60	100	4.6	6.0	0.3	0.04	257021 0005	57,50
5.0	9	60	100	4.6	6.0	0.5	0.04	257021 0006	57,50
6.0	10	60	100	5.5	6.0	0.5	0.06	257021 0007	59,-
6.0	10	60	100	5.5	6.0	1.0	0.06	257021 0008	59,-
8.0	12	60	100	7.4	8.0	0.5	0.08	257021 0009	78,40
8.0	12	60	100	7.4	8.0	1.0	0.08	257021 0010	78,40
10.0	14	85	125	9.2	10.0	1.0	0.09	257021 0011	110,-
10.0	14	85	125	9.2	10.0	2.0	0.09	257021 0012	110,-
12.0	16	110	150	11.0	12.0	1.0	0.1	257021 0013	141,50
12.0	16	110	150	11.0	12.0	2.0	0.1	257021 0014	141,50
16.0	22	110	150	15.0	16.0	1.0	0.11	257021 0015	260,-
16.0	22	110	150	15.0	16.0	2.0	0.11	257021 0016	260,-

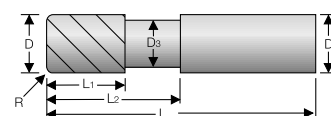
2146



ATORN® RockTec 65 torus cutter

VHM Z 4 793

- With clearance
- For machining materials up to 65 HRC
- Radius tolerance: 0/0.01 mm
- Cutting material: ultra-fine grain solid carbide
- 6°~10° rake angle



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRC	< 60 HRC	≥ 60 HRC
257018....				160-200						○	○	○					●	●	●
257020....				140-160						○	○	○					●	●	●
257022....				120-140						○	○	○					●	●	●

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Standard

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	4	14	60	2.8	6.0	0.3	0.015	257018 0001	35,60
3.0	4	14	60	2.8	6.0	0.5	0.015	257018 0002	35,60
4.0	5	16	60	3.7	6.0	0.3	0.015	257018 0003	38,80
4.0	5	16	60	3.7	6.0	0.5	0.015	257018 0004	38,80
5.0	6	18	60	4.6	6.0	0.3	0.025	257018 0005	38,80
5.0	6	18	60	4.6	6.0	0.5	0.025	257018 0006	38,80
6.0	7	20	60	5.5	6.0	0.5	0.025	257018 0007	45,30
6.0	7	20	60	5.5	6.0	1.0	0.025	257018 0008	45,30
8.0	9	26	64	7.4	8.0	0.5	0.05	257018 0009	63,10
8.0	9	26	64	7.4	8.0	1.0	0.05	257018 0010	63,10
10.0	11	31	70	9.2	10.0	1.0	0.05	257018 0011	80,90
10.0	11	31	70	9.2	10.0	2.0	0.05	257018 0012	80,90
12.0	13	37	75	11.0	12.0	1.0	0.06	257018 0013	110,-
12.0	13	37	75	11.0	12.0	2.0	0.06	257018 0014	110,-
16.0	17	43	90	15.0	16.0	1.0	0.07	257018 0015	184,50
16.0	17	43	90	15.0	16.0	2.0	0.07	257018 0016	184,50



2146

Continued on next page >>>

## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	5	30	75	2.8	6.0	0.3	0.015	<b>257020 0001</b>	<b>46,50</b>
3.0	5	30	75	2.8	6.0	0.5	0.015	257020 0002	46,50
4.0	8	32	75	3.7	6.0	0.3	0.015	257020 0003	46,50
4.0	8	32	75	3.7	6.0	0.5	0.015	257020 0004	46,50
5.0	9	32	75	4.6	6.0	0.3	0.025	257020 0005	46,50
5.0	9	32	75	4.6	6.0	0.5	0.025	257020 0006	46,50
6.0	10	40	75	5.5	6.0	0.5	0.025	257020 0007	50,80
6.0	10	40	75	5.5	6.0	1.0	0.025	257020 0008	50,80
8.0	12	40	75	7.4	8.0	0.5	0.05	257020 0009	67,20
8.0	12	40	75	7.4	8.0	1.0	0.05	257020 0010	67,20
10.0	14	60	100	9.2	10.0	1.0	0.05	257020 0011	92,60
10.0	14	60	100	9.2	10.0	2.0	0.05	257020 0012	92,60
12.0	16	60	100	11.0	12.0	1.0	0.06	257020 0013	113,-
12.0	16	60	100	11.0	12.0	2.0	0.06	257020 0014	113,-
16.0	22	85	125	15.0	16.0	1.0	0.07	257020 0015	224,-
16.0	22	85	125	15.0	16.0	2.0	0.07	257020 0016	224,-

2146



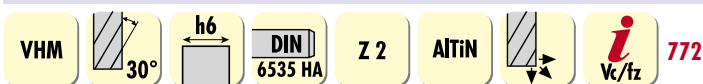
## Extra-long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	5	60	100	2.8	6.0	0.3	0.015	<b>257022 0001</b>	<b>61,60</b>
3.0	5	60	100	2.8	6.0	0.5	0.015	257022 0002	61,60
4.0	8	60	100	3.7	6.0	0.3	0.02	257022 0003	61,60
4.0	8	60	100	3.7	6.0	0.5	0.02	257022 0004	61,60
5.0	9	60	100	4.6	6.0	0.3	0.025	257022 0005	61,60
5.0	9	60	100	4.6	6.0	0.5	0.025	257022 0006	61,60
6.0	10	60	100	5.5	6.0	0.5	0.035	257022 0007	61,60
6.0	10	60	100	5.5	6.0	1.0	0.035	257022 0008	61,60
8.0	12	60	100	7.4	8.0	0.5	0.05	257022 0009	86,50
8.0	12	60	100	7.4	8.0	1.0	0.05	257022 0010	86,50
10.0	14	85	125	9.2	10.0	1.0	0.05	257022 0011	127,50
10.0	14	85	125	9.2	10.0	2.0	0.05	257022 0012	127,50
12.0	16	110	150	11.0	12.0	1.0	0.06	257022 0013	165,-
12.0	16	110	150	11.0	12.0	2.0	0.06	257022 0014	165,-
16.0	22	110	150	15.0	16.0	1.0	0.07	257022 0015	290,-
16.0	22	110	150	15.0	16.0	2.0	0.07	257022 0016	290,-

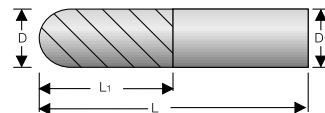
2146



## ATORN® RockTec 52 mini radius milling cutter



- Short, stable design for machining materials **up to 52 HRC**
- Cutting edge tolerance: at  $\varnothing$  0.1 - 0.7 mm = 0/- 0.012 mm, at  $\varnothing$  0.8 - 0.9 mm = 0/- 0.020 mm
- Radius tolerance: 0/0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	>= 30 HRC	< 8 % Si	>= 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	>= 60 HRC		
		100-120	80-100	60-80	50-90	50-90	50-70	50-90	50-90	50-90	50-90	50-90	50-80					30-60		

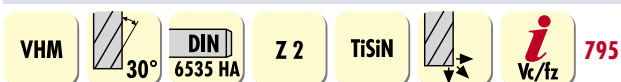
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	R mm	L1 mm	L mm	D1 mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
0.2	0.10	0.4	40	4.0	0.004	257025 0002	49,80
0.3	0.15	0.6	40	4.0	0.004	257025 0003	46,10
0.4	0.20	0.8	40	4.0	0.0065	257025 0004	39,10
0.5	0.25	1.2	40	4.0	0.0065	257025 0005	32,60
0.6	0.30	1.4	40	4.0	0.0065	257025 0006	32,60
0.7	0.35	1.6	40	4.0	0.0065	257025 0007	32,60
0.8	0.40	1.8	40	4.0	0.0065	257025 0008	32,60
0.9	0.45	2.0	40	4.0	0.0085	257025 0009	32,60

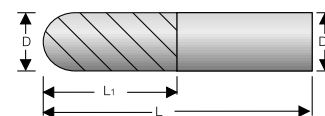
2146



## ATORN® RockTec 65 mini radius milling cutter



- Short, stable design for machining materials **up to 65 HRC**
- Cutting edge tolerance: at  $\varnothing$  0.1 - 0.7 mm = 0/- 0.012 mm, at  $\varnothing$  0.8 - 0.9 mm = 0/- 0.020 mm
- Radius tolerance: 0/0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	>= 30 HRC	< 8 % Si	>= 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	>= 60 HRC	
				60-100						30-100	25-80	25-80					50-90	50-90	40-80

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

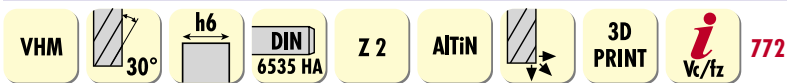
D mm	R mm	L1 mm	L mm	D1 mm	Feed fz hardened steel >= 60 HRC mm/tooth	art.no.	€
0.2	0.10	0.4	40	4.0	0.0025	257026 0002	55,50
0.3	0.15	0.6	40	4.0	0.0025	257026 0003	50,90
0.4	0.20	0.8	40	4.0	0.003	257026 0004	46,30
0.5	0.25	1.2	40	4.0	0.003	257026 0005	46,30
0.6	0.30	1.4	40	4.0	0.003	257026 0006	46,30
0.7	0.35	1.6	40	4.0	0.003	257026 0007	46,30
0.8	0.40	1.8	40	4.0	0.003	257026 0008	46,30
0.9	0.45	2.0	40	4.0	0.0065	257026 0009	46,30

2146

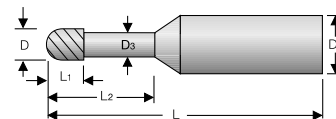




# ATORN® RockTec 52 mini radius milling cutter



- **With clearance**
- Long-necked version for machining materials **up to 52 HRC**
- Cutting edge tolerance: at  $\varnothing 0.1 - 0.7 \text{ mm} = 0/- 0.012 \text{ mm}$ , at  $\varnothing 0.8 - 3.0 \text{ mm} = 0/- 0.020 \text{ mm}$
- Radius tolerance:  $0/0.01 \text{ mm}$
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle  $3^\circ$



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel	
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	≥ 60 HRc
● very well suited ○ well suited	●	●	●	●	●	○	●	●	●	●	●				●	
	100-120	80-100	60-80	50-90	50-90	50-70	50-90	50-90	50-90	50-90	50-80				30-60	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

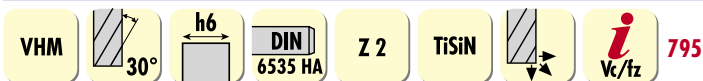
D mm	R mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz mm/tooth	art.no.	€
0.2	0.10	0.2	0.5	50	0.15	4.0	0.003	257033 0001	47,50
0.2	0.10	0.2	1.0	50	0.15	4.0	0.003	257033 0002	47,50
0.2	0.10	0.2	1.5	50	0.15	4.0	0.003	257033 0003	47,50
0.3	0.15	0.3	1.0	50	0.25	4.0	0.003	257033 0004	47,50
0.3	0.15	0.3	2.0	50	0.25	4.0	0.003	257033 0005	47,50
0.3	0.15	0.3	3.0	50	0.25	4.0	0.003	257033 0006	47,50
0.4	0.20	0.4	1.0	50	0.35	4.0	0.0065	257033 0007	44,-
0.4	0.20	0.4	2.0	50	0.35	4.0	0.0065	257033 0008	44,-
0.4	0.20	0.4	3.0	50	0.35	4.0	0.0065	257033 0009	44,-
0.4	0.20	0.4	4.0	50	0.35	4.0	0.0065	257033 0010	44,-
0.4	0.20	0.4	5.0	50	0.35	4.0	0.0065	257033 0011	44,-
0.5	0.25	0.4	2.0	50	0.45	4.0	0.0065	257033 0012	41,50
0.5	0.25	0.4	3.0	50	0.45	4.0	0.0065	257033 0013	41,50
0.5	0.25	0.4	4.0	50	0.45	4.0	0.0065	257033 0014	41,50
0.5	0.25	0.4	5.0	50	0.45	4.0	0.0065	257033 0015	41,50
0.5	0.25	0.4	6.0	50	0.45	4.0	0.0065	257033 0016	41,50
0.5	0.25	0.4	8.0	50	0.45	4.0	0.0065	257033 0017	41,50
0.6	0.30	0.5	2.0	50	0.55	4.0	0.0065	257033 0018	39,70
0.6	0.30	0.5	3.0	50	0.55	4.0	0.0065	257033 0019	39,70
0.6	0.30	0.5	4.0	50	0.55	4.0	0.0065	257033 0020	39,70
0.6	0.30	0.5	5.0	50	0.55	4.0	0.0065	257033 0021	39,70
0.6	0.30	0.5	6.0	50	0.55	4.0	0.0065	257033 0022	39,70
0.6	0.30	0.5	8.0	50	0.55	4.0	0.0065	257033 0023	39,70
0.8	0.40	0.6	2.0	50	0.75	4.0	0.0065	257033 0024	39,70
0.8	0.40	0.6	4.0	50	0.75	4.0	0.0065	257033 0025	39,70
0.8	0.40	0.6	5.0	50	0.75	4.0	0.0065	257033 0026	39,70
0.8	0.40	0.6	6.0	50	0.75	4.0	0.0065	257033 0027	39,70

2146

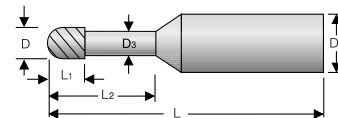
D mm	R mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz mm/tooth	art.no.	€
0.8	0.40	0.6	7.0	50	0.75	4.0	0.0065	257033 0028	39,70
0.8	0.40	0.6	8.0	50	0.75	4.0	0.0065	257033 0029	39,70
0.8	0.40	0.6	10.0	50	0.75	4.0	0.0065	257033 0030	39,70
1.0	0.50	0.8	3.0	50	0.95	4.0	0.0085	257033 0031	29,40
1.0	0.50	0.8	6.0	50	0.95	4.0	0.0085	257033 0032	29,40
1.0	0.50	0.8	8.0	50	0.95	4.0	0.0085	257033 0033	29,40
1.0	0.50	0.8	10.0	50	0.95	4.0	0.0085	257033 0034	30,20
1.0	0.50	0.8	12.0	50	0.95	4.0	0.0085	257033 0035	30,50
1.0	0.50	0.8	16.0	50	0.95	4.0	0.0085	257033 0036	31,30
1.0	0.50	0.8	20.0	60	0.95	4.0	0.0085	257033 0037	31,30
1.2	0.60	1.0	6.0	50	1.15	4.0	0.0085	257033 0038	31,10
1.2	0.60	1.0	10.0	50	1.15	4.0	0.0085	257033 0039	31,50
1.5	0.75	1.2	8.0	50	1.45	4.0	0.0085	257033 0040	29,10
1.5	0.75	1.2	12.0	50	1.45	4.0	0.0085	257033 0041	29,30
1.5	0.75	1.2	16.0	50	1.45	4.0	0.0085	257033 0042	29,60
1.5	0.75	1.2	18.0	60	1.45	4.0	0.0085	257033 0043	31,10
2.0	1.0	1.6	4.0	50	1.95	4.0	0.019	257033 0044	28,40
2.0	1.0	1.6	8.0	50	1.95	4.0	0.019	257033 0045	28,80
2.0	1.0	1.6	12.0	50	1.95	4.0	0.019	257033 0046	29,10
2.0	1.0	1.6	16.0	50	1.95	4.0	0.019	257033 0047	29,80
2.0	1.0	1.6	20.0	60	1.95	4.0	0.019	257033 0048	33,40
2.0	1.0	1.6	25.0	75	1.95	4.0	0.019	257033 0049	36,50
3.0	1.50	2.4	8.0	50	2.85	6.0	0.0235	257033 0050	43,-
3.0	1.50	2.4	10.0	50	2.85	6.0	0.0235	257033 0051	43,-
3.0	1.50	2.4	16.0	60	2.85	6.0	0.0235	257033 0052	43,-
3.0	1.50	2.4	20.0	60	2.85	6.0	0.0235	257033 0053	43,-
3.0	1.50	2.4	25.0	75	2.85	6.0	0.0235	257033 0054	47,-

2146

# ATORN® RockTec 65 mini radius milling cutter



- **With clearance**
- Long-necked version for machining materials **up to 65 HRC**
- Cutting edge tolerance: at  $\varnothing 0.1 - 0.7 \text{ mm} = 0/-0.012 \text{ mm}$ , at  $\varnothing 0.8 - 3.0 \text{ mm} = 0/-0.020 \text{ mm}$
- Radius tolerance:  $0/0.01 \text{ mm}$
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle  $-5^\circ$



material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc		
			60-100							30-100	25-80	25-80				50-90	50-90	40-80		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	R mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.2	0.10	0.2	0.5	50	0.15	4.0	0.0025	257034 0001	56,50
0.2	0.10	0.2	1.0	50	0.15	4.0	0.0025	257034 0002	56,50
0.2	0.10	0.2	1.5	50	0.15	4.0	0.0025	257034 0003	56,50
0.3	0.15	0.3	1.0	50	0.25	4.0	0.0025	257034 0004	54,50
0.3	0.15	0.3	2.0	50	0.25	4.0	0.0025	257034 0005	54,50
0.3	0.15	0.3	3.0	50	0.25	4.0	0.0025	257034 0006	54,50
0.4	0.20	0.4	1.0	50	0.35	4.0	0.003	257034 0007	50,70
0.4	0.20	0.4	2.0	50	0.35	4.0	0.003	257034 0008	50,70
0.4	0.20	0.4	3.0	50	0.35	4.0	0.003	257034 0009	50,70
0.4	0.20	0.4	4.0	50	0.35	4.0	0.003	257034 0010	50,70
0.4	0.20	0.4	5.0	50	0.35	4.0	0.003	257034 0011	50,70
0.5	0.25	0.4	2.0	50	0.45	4.0	0.003	257034 0012	48,-
0.5	0.25	0.4	3.0	50	0.45	4.0	0.003	257034 0013	48,-
0.5	0.25	0.4	4.0	50	0.45	4.0	0.003	257034 0014	48,-
0.5	0.25	0.4	5.0	50	0.45	4.0	0.003	257034 0015	48,-
0.5	0.25	0.4	6.0	50	0.45	4.0	0.003	257034 0016	48,-
0.5	0.25	0.4	8.0	50	0.45	4.0	0.003	257034 0017	48,-
0.6	0.30	0.5	2.0	50	0.55	4.0	0.003	257034 0018	45,60
0.6	0.30	0.5	3.0	50	0.55	4.0	0.003	257034 0019	45,60
0.6	0.30	0.5	4.0	50	0.55	4.0	0.003	257034 0020	45,60
0.6	0.30	0.5	5.0	50	0.55	4.0	0.003	257034 0021	45,60
0.6	0.30	0.5	6.0	50	0.55	4.0	0.003	257034 0022	45,60
0.6	0.30	0.5	8.0	50	0.55	4.0	0.003	257034 0023	45,60
0.8	0.40	0.6	2.0	50	0.75	4.0	0.003	257034 0024	45,60
0.8	0.40	0.6	4.0	50	0.75	4.0	0.003	257034 0025	45,60
0.8	0.40	0.6	5.0	50	0.75	4.0	0.003	257034 0026	45,60
0.8	0.40	0.6	6.0	50	0.75	4.0	0.003	257034 0027	45,60

2146

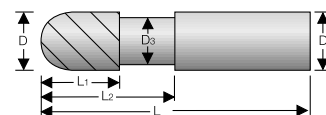
D mm	R mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.8	0.40	0.6	7.0	50	0.75	4.0	0.003	257034 0028	45,60
0.8	0.40	0.6	8.0	50	0.75	4.0	0.003	257034 0029	45,60
0.8	0.40	0.6	10.0	50	0.75	4.0	0.003	257034 0030	45,60
1.0	0.50	0.8	3.0	50	0.95	4.0	0.0065	257034 0031	33,70
1.0	0.50	0.8	6.0	50	0.95	4.0	0.0065	257034 0032	33,70
1.0	0.50	0.8	8.0	50	0.95	4.0	0.0065	257034 0033	33,70
1.0	0.50	0.8	10.0	50	0.95	4.0	0.0065	257034 0034	34,60
1.0	0.50	0.8	12.0	50	0.95	4.0	0.0065	257034 0035	35,-
1.0	0.50	0.8	16.0	50	0.95	4.0	0.0065	257034 0036	36,-
1.0	0.50	0.8	20.0	60	0.95	4.0	0.0065	257034 0037	36,-
1.2	0.60	1.0	6.0	50	1.15	4.0	0.0065	257034 0038	35,70
1.2	0.60	1.0	10.0	50	1.15	4.0	0.0065	257034 0039	36,20
1.5	0.75	1.2	8.0	50	1.45	4.0	0.0065	257034 0040	33,30
1.5	0.75	1.2	12.0	50	1.45	4.0	0.0065	257034 0041	33,70
1.5	0.75	1.2	16.0	50	1.45	4.0	0.0065	257034 0042	34,10
1.5	0.75	1.2	18.0	60	1.45	4.0	0.0065	257034 0043	35,70
2.0	1.0	1.6	4.0	50	1.95	4.0	0.0075	257034 0044	32,90
2.0	1.0	1.6	8.0	50	1.95	4.0	0.0075	257034 0045	33,-
2.0	1.0	1.6	12.0	50	1.95	4.0	0.0075	257034 0046	33,40
2.0	1.0	1.6	16.0	50	1.95	4.0	0.0075	257034 0047	34,20
2.0	1.0	1.6	20.0	60	1.95	4.0	0.0075	257034 0048	38,30
2.0	1.0	1.6	25.0	75	1.95	4.0	0.0075	257034 0049	41,80
3.0	1.50	2.4	8.0	50	2.85	6.0	0.0155	257034 0050	49,30
3.0	1.50	2.4	10.0	50	2.85	6.0	0.0155	257034 0051	49,30
3.0	1.50	2.4	16.0	60	2.85	6.0	0.0155	257034 0052	49,30
3.0	1.50	2.4	20.0	60	2.85	6.0	0.0155	257034 0053	49,30
3.0	1.50	2.4	25.0	75	2.85	6.0	0.0155	257034 0054	54,-

2146

# ATORN® RockTec 52 radius milling cutter

VHM 773

- With clearance
- For machining materials up to 52 HRC
- Radius tolerance: 0/-0.01 mm
- Cutting material: ultra-fine grain solid carbide
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
257027....	●	180-370	180-350	180-350	●	●	○	●	●	●	●	●					●		
257029....	●	160-320	160-300	160-300	●	●	○	●	●	●	●	●					●		
257031....	●	90-190	90-190	90-190	●	●	○	●	●	●	●	●					●		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D	L1	L2	L	D3	D1	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	steel < 1400 N/mm² mm/tooth		
2.0	4	8	40	1.85	4.0	1.00	0.035	257027 0020	24,80
2.5	4	10	40	2.35	4.0	1.25	0.035	257027 0025	29,70
3.0	5	14	50	2.80	4.0	1.50	0.035	257027 0030	37,90
4.0	8	20	50	3.70	4.0	2.00	0.0475	257027 0040	37,90
5.0	9	20	50	4.60	6.0	2.50	0.0475	257027 0050	34,60
6.0	10	20	50	5.50	6.0	3.00	0.065	257027 0060	34,60
8.0	12	30	64	7.40	8.0	4.00	0.065	257027 0080	46,40
10.0	14	32	70	9.20	10.0	5.00	0.1	257027 0100	58,-
12.0	16	38	75	11.0	12.0	6.00	0.1	257027 0120	85,-
16.0	32	46	90	15.0	16.0	8.00	0.105	257027 0160	142,50
20.0	38	58	100	19.0	20.0	10.00	0.105	257027 0200	219,-



2146

## Long

D	L1	L2	L	D3	D1	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	steel < 1400 N/mm² mm/tooth		
2.0	4	14	75	1.85	6.0	1.00	0.035	257029 0020	51,40
2.5	4	18	75	2.35	6.0	1.25	0.035	257029 0025	51,40
3.0	5	21	75	2.80	6.0	1.50	0.035	257029 0030	52,40
4.0	8	28	75	3.70	6.0	2.00	0.0475	257029 0040	52,40
5.0	9	32	75	4.60	6.0	2.50	0.0475	257029 0050	52,40
6.0	10	40	75	5.50	6.0	3.00	0.065	257029 0060	52,40
8.0	12	40	75	7.40	8.0	4.00	0.065	257029 0080	61,60
10.0	14	60	100	9.20	10.0	5.00	0.1	257029 0100	80,90
12.0	16	60	100	11.0	12.0	6.00	0.1	257029 0120	105,-
16.0	32	80	125	15.0	16.0	8.00	0.105	257029 0160	209,-
20.0	38	80	125	19.0	20.0	10.00	0.105	257029 0200	295,-



2146

## Extra-long

D	L1	L2	L	D3	D1	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm	mm	steel < 1400 N/mm² mm/tooth		
2.0	4	20	100	1.85	6.0	1.00	0.035	257031 0020	54,-
2.5	4	25	100	2.35	6.0	1.25	0.035	257031 0025	54,-
3.0	5	30	100	2.80	6.0	1.50	0.035	257031 0030	54,-
4.0	8	40	100	3.70	6.0	2.00	0.0475	257031 0040	54,-
5.0	9	50	100	4.60	6.0	2.50	0.0475	257031 0050	54,-
6.0	10	60	150	5.50	6.0	3.00	0.065	257031 0060	54,-
8.0	12	80	150	7.40	8.0	4.00	0.065	257031 0080	81,40
10.0	14	100	150	9.20	10.0	5.00	0.1	257031 0100	112,-
12.0	16	110	150	11.00	12.0	6.00	0.1	257031 0120	161,-
16.0	32	150	200	15.00	16.0	8.00	0.105	257031 0160	260,-
20.0	38	150	200	19.00	20.0	10.00	0.105	257031 0200	341,-

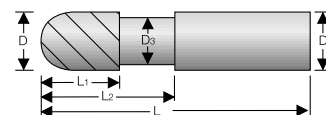


2146

# ATORN® RockTec 65 radius milling cutter



- With clearance
- For machining materials up to 65 HRC
- Radius tolerance: 0/-0.01 mm
- Cutting material: ultra-fine grain solid carbide
- Rake angle -10°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	>= 30 HRC	< 8 % Si	>= 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	>= 60 HRC	
257028....				180-370						180-250	180-250	150-210					100-220	100-220	50-80
257030....				130-320						130-300	130-300	120-260					100-200	100-200	40-65
257032....				80-190						80-190	80-190	70-180					60-130	60-130	25-45

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
2.0	4	8	40	1.85	4.0	1.00	0.03	257028 0020	30,40
2.5	4	10	40	2.35	4.0	1.25	0.03	257028 0025	35,70
3.0	5	14	50	2.80	4.0	1.50	0.03	257028 0030	39,-
4.0	8	20	50	3.70	4.0	2.00	0.0425	257028 0040	40,70
5.0	9	20	50	4.60	6.0	2.50	0.0425	257028 0050	42,-
6.0	10	20	50	5.50	6.0	3.00	0.0625	257028 0060	42,-
8.0	12	30	64	7.40	8.0	4.00	0.0625	257028 0080	50,90
10.0	14	32	70	9.20	10.0	5.00	0.09	257028 0100	67,20
12.0	16	38	75	11.0	12.0	6.00	0.09	257028 0120	96,70
16.0	32	46	90	15.0	16.0	8.00	0.095	257028 0160	153,-
20.0	38	58	100	19.0	20.0	10.00	0.095	257028 0200	239,-

2146

## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
2.0	4	14	75	1.85	6.0	1.00	0.03	257030 0020	52,90
2.5	4	18	75	2.35	6.0	1.25	0.03	257030 0025	52,90
3.0	5	21	75	2.80	6.0	1.50	0.03	257030 0030	52,90
4.0	8	28	75	3.70	6.0	2.00	0.0425	257030 0040	52,90
5.0	9	32	75	4.60	6.0	2.50	0.0425	257030 0050	52,90
6.0	10	40	75	5.50	6.0	3.00	0.0625	257030 0060	52,90
8.0	12	40	75	7.40	8.0	4.00	0.0625	257030 0080	65,60
10.0	14	60	100	9.20	10.0	5.00	0.09	257030 0100	108,-
12.0	16	60	100	11.0	12.0	6.00	0.09	257030 0120	141,50
16.0	32	80	125	15.0	16.0	8.00	0.095	257030 0160	234,-
20.0	38	80	125	19.0	20.0	10.00	0.095	257030 0200	331,-

2146

## Extra-long

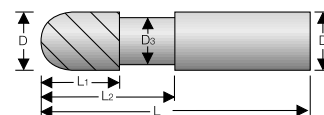
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
2.0	4	20	100	1.85	6.0	1.00	0.03	257032 0020	62,60
2.5	4	25	100	2.35	6.0	1.25	0.03	257032 0025	62,60
3.0	5	30	100	2.80	6.0	1.50	0.03	257032 0030	62,60
4.0	8	40	100	3.70	6.0	2.00	0.0425	257032 0040	62,60
5.0	9	50	100	4.60	6.0	2.50	0.0425	257032 0050	62,60
6.0	10	60	150	5.50	6.0	3.00	0.0625	257032 0060	62,60
8.0	12	80	150	7.40	8.0	4.00	0.0625	257032 0080	91,60
10.0	14	100	150	9.20	10.0	5.00	0.09	257032 0100	128,50
12.0	16	110	150	11.00	12.0	6.00	0.09	257032 0120	183,50
16.0	32	150	200	15.00	16.0	8.00	0.095	257032 0160	295,-
20.0	38	150	200	19.00	20.0	10.00	0.095	257032 0200	375,-

2146

# ATORN® RockTec 52 radius milling cutter

VHM
 30°
 e8
 h6
 DIN 6535 HA
Z 4
AlTiN
 3D PRINT
 Vc/fz
773

- With clearance
- For machining materials up to 52 HRC
- Radius tolerance: 0/-0.01 mm
- Cutting material: ultra-fine grain solid carbide
- Rake angle 3°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
257035....	●	●	●	●	●	●	○	●	●	●	●	●					●		
257037....	●	●	●	●	●	●	○	●	●	●	●	●					●		

Cutting speed Vc m/min.
Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	5	14	50	2.80	6	1.50	0.035	257035 0030	41,70
4.0	8	20	50	3.70	6	2.00	0.0475	257035 0040	41,70
5.0	9	20	50	4.60	6	2.50	0.0475	257035 0050	41,70
6.0	10	20	50	5.50	6	3.00	0.065	257035 0060	41,70
8.0	12	30	64	7.40	8	4.00	0.065	257035 0080	55,50
10.0	14	32	70	9.20	10	5.00	0.1	257035 0100	71,70
12.0	16	38	75	11.00	12	6.00	0.1	257035 0120	99,70
16.0	32	46	90	15.00	16	8.00	0.105	257035 0160	151,-
20.0	38	58	100	19.00	20	10.00	0.105	257035 0200	260,-

2146



## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	5	21	75	2.80	6	1.50	0.035	257037 0030	53,40
4.0	8	28	75	3.70	6	2.00	0.0475	257037 0040	53,40
5.0	9	32	75	4.60	6	2.50	0.0475	257037 0050	53,40
6.0	10	40	75	5.50	6	3.00	0.065	257037 0060	53,40
8.0	12	40	75	7.40	8	4.00	0.065	257037 0080	70,70
10.0	14	60	100	9.20	10	5.00	0.1	257037 0100	118,-
12.0	16	60	100	11.00	12	6.00	0.1	257037 0120	151,-
16.0	32	80	125	15.00	16	8.00	0.105	257037 0160	234,-
20.0	38	80	125	19.00	20	10.00	0.105	257037 0200	331,-

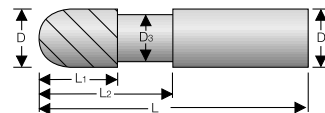
2146



# ATORN® RockTec 65 radius milling cutter



- With clearance
- For machining materials up to 65 HRC
- Radius tolerance: 0/-0.01 mm
- Cutting material: ultra-fine grain solid carbide
- Rake angle -10°



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
257036....				○						○	○	○					●	●	●
				○						○	○	○					●	●	●
257038....				○						○	○	○					●	●	●
				○						○	○	○					●	●	●

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	5	14	50	2.80	6	1.50	0.03	257036 0030	48,20
4.0	8	20	50	3.70	6	2.00	0.0425	257036 0040	48,20
5.0	9	20	50	4.60	6	2.50	0.0425	257036 0050	48,20
6.0	10	20	50	5.50	6	3.00	0.0625	257036 0060	48,20
8.0	12	30	64	7.40	8	4.00	0.0625	257036 0080	65,60
10.0	14	32	70	9.20	10	5.00	0.09	257036 0100	82,90
12.0	16	38	75	11.00	12	6.00	0.09	257036 0120	129,50
16.0	32	46	90	15.00	16	8.00	0.095	257036 0160	178,-
20.0	38	58	100	19.00	20	10.00	0.095	257036 0200	295,-

2146



## Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3.0	5	21	75	2.80	6	1.50	0.03	257038 0030	60,10
4.0	8	28	75	3.70	6	2.00	0.0425	257038 0040	60,10
5.0	9	32	75	4.60	6	2.50	0.0425	257038 0050	60,10
6.0	10	40	75	5.50	6	3.00	0.0625	257038 0060	60,10
8.0	12	40	75	7.40	8	4.00	0.0625	257038 0080	73,80
10.0	14	60	100	9.20	10	5.00	0.09	257038 0100	125,50
12.0	16	60	100	11.00	12	6.00	0.09	257038 0120	161,-
16.0	32	80	125	15.00	16	8.00	0.095	257038 0160	275,-
20.0	38	80	125	19.00	20	10.00	0.095	257038 0200	405,-

2146





# ATORN® RockTec PRO

INFO

to  
**65**  
HRC

## TRUE, INHERENT POWER

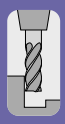
- particularly suited to machining steels <1400 N/mm, <55 HRC, <60 HRC and <65 HRC
- wide product range, all geometries with maximum precision
- new TiAlSiN multi-layer coating, extreme hardness and minimal friction

Hard machining is playing a growing role in tool and mould making and is increasingly replacing time-consuming processes such as grinding or eroding. But also in other sectors, components must still be reworked after hardening. This often poses enormous challenges for milling tools. And now, ATORN presents ultra-specialist milling tools for all conceivable milling applications.

These **high-performance tools** are optimally designed for hard machining **up to 65 HRC**.

Due to their optimised geometry and the new extremely hard multi-layer coating, ATORN RockTec PRO milling tools guarantee low abrasion and are therefore particularly wear-resistant.

For example, they can handle high-alloy tool steels such as 1.2379 at high feed rates up to 250 m/min and tooth feeds 0.001 to 0.15 mm.



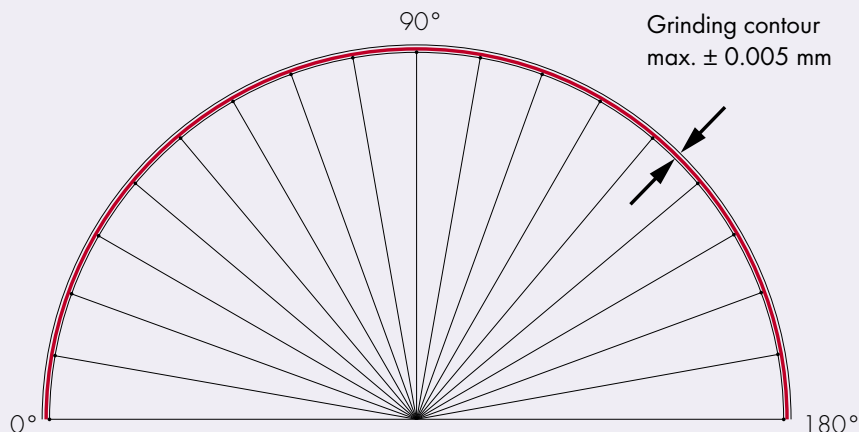
Mini-radius milling cutter from Ø 0.1 mm



Range overview	Z	RockTec PRO Range	Short	Standard	Long	Ø range mm	Page
Multi-flute milling cutters 90°	6-10		●	●	●	Ø 3-20	582
Multi-flute milling cutters with corner radius	6-10		●	●	●	Ø 3-20	583
Trochoidal end milling cutter	4-5			●	●	Ø 6-20	585
Mini-torus milling cutters R= 0.05	2			●		Ø 0,2-0,5	586
Mini-torus milling cutters R=0.1	2			●		Ø 0,5-2	586
Mini-torus milling cutters R=0.2	2			●		Ø 1-2	587
Mini-torus milling cutters R=0.3	2			●		Ø 1,5-3	588
Mini-torus milling cutters R=0.5	2			●		Ø 2,5-3	588
Torus milling cutters	4			●	●	Ø 1-16	589
Torus face milling cutter	4			●	●	Ø 2-16	591
Mini-radius milling cutters	2			●		Ø 0,1-3	592
Radius milling cutters	2		●	●	●	Ø 1-20	593

material	● very well suited	steel			stainless steel			cast iron		titanium	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	alloys	<30 HRC	≥30 HRC	<8% Si	≥8% Si	GRP/CFP/thermo.	<55 HRC	<60 HRC	≥60 HRC
				●												●	●	●
				140-160												80-110	80-110	50-80

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



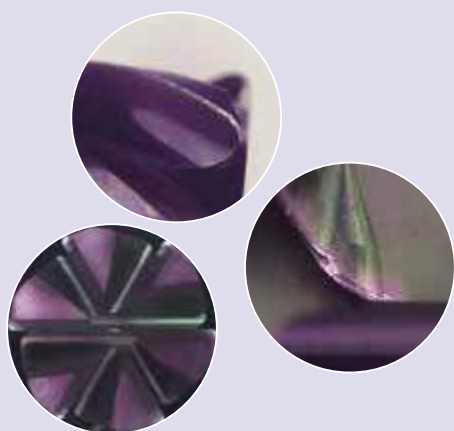
**Tolerances**

Cutting edge diameter	0 / -0.005 mm
Radius / torus milling cutter	± 0.0025 mm
Radius contour radius copy milling cutter	0 / -0.005 mm
Clearance diameter	0 / -0.01 mm

**Test Winner**

RockTec PRO emerged the winner in a comparative test conducted by GFE Gesellschaft für Fertigungstechnik und Entwicklung Schmalkalden e.V. Set against the competition, RockTec PRO milling cutters proved themselves in hard milling trials.

A 1.2379 (X153 CrMo V12) tool steel with a hardness of 58 HRC was machined. This involved milling test tracks with defined ap and ae using different solid carbide milling cutters. RockTec PRO milling cutters exhibited the longest tool life overall and thus were Number 1 in the overall rating.



**Test results**

- low flank wear
- few nicks
- low edge build-up
- minimal coating wear

**Spiral angle** .....  
for extremely soft cutting in hard materials

**Geometry** .....  
reliable chip removal and consistently high process reliability

**Cutting material** .....  
Micrograin solid carbide, especially for hardened steels

**Front face** .....  
optimised radii and front face geometries

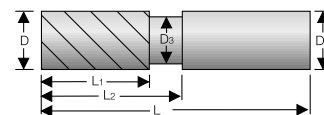
**Cutting edges** .....  
relief-ground cutting edges

**Coating** .....  
TiAlSiN multi-layer coating with extreme hardness

# ATORN® Multi-flute milling cutter 90° RockTec PRO

VHM
45°
f7
h5
DIN 6535 HA
Z 6
Z 8+
TiAlSiN
Vc/fz
804

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
				● 100-180												● 100-140	● 90-130	● 80-120	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	2.9	57	4	12	6	0.020	<b>257170 0030</b>	<b>35,50</b>
4	6	3.8	57	5	14	6	0.030	257170 0040	<b>41,50</b>
5	6	4.7	57	6	16	6	0.035	257170 0050	<b>42,10</b>
6	6	5.6	57	7	20	6	0.040	257170 0060	<b>47,80</b>
8	8	7.6	63	9	26	6	0.050	257170 0080	<b>54,60</b>
10	10	9.4	72	11	32	6	0.055	257170 0100	<b>94,20</b>
12	12	11.4	83	12	38	6	0.065	257170 0120	<b>129,-</b>
16	16	15.4	92	16	44	8	0.075	257170 0160	<b>229,-</b>
20	20	19.4	104	20	52	10	0.085	257170 0200	<b>328,-</b>

2178



## Standard

D mm	D1 mm	D3 mm	L mm	L1 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	-	57	9	6	0.020	<b>257175 0030</b>	<b>43,20</b>
4	6	-	57	11	6	0.030	257175 0040	<b>48,10</b>
5	6	-	57	13	6	0.035	257175 0050	<b>51,90</b>
6	6	-	57	15	6	0.040	257175 0060	<b>55,20</b>
8	8	-	63	19	6	0.050	257175 0080	<b>64,30</b>
10	10	-	72	24	6	0.055	257175 0100	<b>109,50</b>
12	12	-	83	28	6	0.065	257175 0120	<b>152,50</b>
16	16	-	92	36	8	0.075	257175 0160	<b>287,-</b>
20	20	-	104	44	10	0.085	257175 0200	<b>420,-</b>

2178



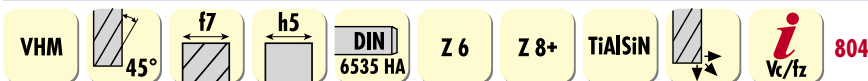
## Long

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	-	65	9	11	6	0.020	<b>257180 0030</b>	<b>53,40</b>
4	6	-	65	12	13	6	0.030	257180 0040	<b>58,-</b>
5	6	-	65	15	15	6	0.035	257180 0050	<b>61,60</b>
6	6	-	65	18	-	6	0.040	257180 0060	<b>63,60</b>
8	8	-	70	24	-	6	0.050	257180 0080	<b>68,20</b>
10	10	-	85	30	-	6	0.055	257180 0100	<b>133,50</b>
12	12	-	93	36	-	6	0.065	257180 0120	<b>176,50</b>
16	16	-	110	48	-	8	0.075	257180 0160	<b>318,-</b>
20	20	-	126	60	-	10	0.085	257180 0200	<b>519,-</b>

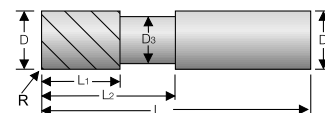
2178



# ATORN® Multi-flute milling cutter with corner radius RockTec PRO



- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
257155....				●													●	●	●
				80-130													60-150	80-150	120-200
257160....				●													●	●	●
				100-180													100-140	90-130	80-120
257165....				●													●	●	●
				100-180													100-140	90-130	80-120

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	2.9	57	4	12	6	0.1	0.020	257155 0301	65,70
3	6	2.9	57	4	12	6	0.5	0.020	257155 0305	65,70
4	6	3.8	57	5	14	6	0.1	0.030	257155 0401	65,70
4	6	3.8	57	5	14	6	0.5	0.030	257155 0405	65,70
4	6	3.8	57	5	14	6	1	0.030	257155 0410	65,70
5	6	4.7	57	6	16	6	0.1	0.035	257155 0501	65,70
5	6	4.7	57	6	16	6	0.5	0.035	257155 0505	65,70
5	6	4.7	57	6	16	6	1	0.035	257155 0510	65,70
6	6	5.6	57	7	20	6	0.1	0.040	257155 0601	65,70
6	6	5.6	57	7	20	6	0.5	0.040	257155 0605	65,70
6	6	5.6	57	7	20	6	0.8	0.040	257155 0608	65,70
6	6	5.6	57	7	20	6	1	0.040	257155 0610	65,70
6	6	5.6	57	7	20	6	1.5	0.040	257155 0615	65,70
8	8	7.6	63	9	26	6	0.1	0.050	257155 0801	85,70
8	8	7.6	63	9	26	6	0.5	0.050	257155 0805	85,70
8	8	7.6	63	9	26	6	0.8	0.050	257155 0808	85,70
8	8	7.6	63	9	26	6	1	0.050	257155 0810	85,70
8	8	7.6	63	9	26	6	1.5	0.050	257155 0815	85,70
8	8	7.6	63	9	26	6	2.0	0.050	257155 0820	85,70
10	10	9.4	72	11	32	6	0.1	0.055	257155 1001	112,-
10	10	9.4	72	11	32	6	0.5	0.055	257155 1005	112,-
10	10	9.4	72	11	32	6	0.8	0.055	257155 1008	112,-
10	10	9.4	72	11	32	6	1	0.055	257155 1010	112,-
10	10	9.4	72	11	32	6	1.5	0.055	257155 1015	112,-
10	10	9.4	72	11	32	6	2	0.055	257155 1020	112,-
12	12	11.4	83	12	38	6	0.1	0.065	257155 1201	150,50
12	12	11.4	83	12	38	6	0.5	0.065	257155 1205	150,50
12	12	11.4	83	12	38	6	1	0.065	257155 1210	150,50
12	12	11.4	83	12	38	6	1.5	0.065	257155 1215	150,50
12	12	11.4	83	12	38	6	2	0.065	257155 1220	150,50
16	16	15.4	92	16	44	8	0.5	0.075	257155 1605	256,-
16	16	15.4	92	16	44	8	1	0.075	257155 1610	256,-
16	16	15.4	92	16	44	8	2	0.075	257155 1620	256,-
16	16	15.4	92	16	44	8	3	0.075	257155 1630	256,-
20	20	19.4	104	20	52	10	1	0.085	257155 2010	395,-



Continued on next page >>>

## Standard

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	-	57	9	11	6	0.1	0.020	<b>257160 0301</b>	<b>59,20</b>
3	6	-	57	9	11	6	0.5	0.020	257160 0305	59,20
4	6	-	57	11	13	6	0.1	0.030	257160 0401	59,20
4	6	-	57	11	13	6	0.5	0.030	257160 0405	59,20
4	6	-	57	11	13	6	1	0.030	257160 0410	59,20
5	6	-	57	13	15	6	0.1	0.035	257160 0501	59,20
5	6	-	57	13	15	6	0.5	0.035	257160 0505	59,20
5	6	-	57	13	15	6	1	0.035	257160 0510	59,20
6	6	-	57	15	-	6	0.1	0.040	257160 0601	59,20
6	6	-	57	15	-	6	0.5	0.040	257160 0605	59,20
6	6	-	57	15	-	6	1	0.040	257160 0610	59,20
8	8	-	63	19	-	6	0.1	0.050	257160 0801	68,20
8	8	-	63	19	-	6	0.5	0.050	257160 0805	68,20
8	8	-	63	19	-	6	1	0.050	257160 0810	68,20
10	10	-	72	24	-	6	0.1	0.055	257160 1001	118,50
10	10	-	72	24	-	6	0.5	0.055	257160 1005	118,50
10	10	-	72	24	-	6	1	0.055	257160 1010	118,50
10	10	-	72	24	-	6	1.5	0.055	257160 1015	118,50
12	12	-	83	28	-	6	0.1	0.065	257160 1201	159,50
12	12	-	83	28	-	6	0.5	0.065	257160 1205	159,50
12	12	-	83	28	-	6	1	0.065	257160 1210	159,50
12	12	-	83	28	-	6	1.5	0.065	257160 1215	159,50
16	16	-	92	36	-	8	0.5	0.075	257160 1605	284,-
16	16	-	92	36	-	8	1	0.075	257160 1610	284,-
20	20	-	104	44	-	10	1	0.085	257160 2010	410,-

2178



## Long

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	-	65	9	-	6	0.1	0.020	<b>257165 0301</b>	<b>66,-</b>
3	6	-	65	9	-	6	0.5	0.020	257165 0305	66,-
4	6	-	65	12	-	6	0.1	0.030	257165 0401	66,-
4	6	-	65	12	-	6	0.5	0.030	257165 0405	66,-
4	6	-	65	12	-	6	1	0.030	257165 0410	66,-
5	6	-	65	15	-	6	0.1	0.035	257165 0501	66,-
5	6	-	65	15	-	6	0.5	0.035	257165 0505	66,-
5	6	-	65	15	-	6	1	0.035	257165 0510	66,-
6	6	-	65	18	-	6	0.1	0.040	257165 0601	66,-
6	6	-	65	18	-	6	0.5	0.040	257165 0605	66,-
6	6	-	65	18	-	6	1	0.040	257165 0610	66,-
8	8	-	70	24	-	6	0.1	0.050	257165 0801	74,50
8	8	-	70	24	-	6	0.5	0.050	257165 0805	74,50
8	8	-	80	24	-	6	1	0.050	257165 0810	74,50
10	10	-	85	30	-	6	0.1	0.055	257165 1001	133,50
10	10	-	85	30	-	6	0.5	0.055	257165 1005	133,50
10	10	-	85	30	-	6	1	0.055	257165 1010	133,50
10	10	-	85	30	-	6	1.5	0.055	257165 1015	133,50
12	12	-	93	36	-	6	0.1	0.065	257165 1201	181,50
12	12	-	93	36	-	6	0.5	0.065	257165 1205	181,50
12	12	-	93	36	-	6	1	0.065	257165 1210	181,50
16	16	-	110	48	-	8	0.5	0.075	257165 1605	344,-
16	16	-	110	48	-	8	1	0.075	257165 1610	344,-
20	20	-	126	60	-	10	1	0.085	257165 2010	509,-

2178



**ATORN® Trochoidal RockTec PRO end milling cutter**



- For machining materials from 47 to 65 HRC
- **Milling cutter designed for TVC use**
- With chip breaker
- Reinforced core
- Optimised geometry for hard machining
- **Solid carbide ultra-fine grain cutting material**
- State-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**

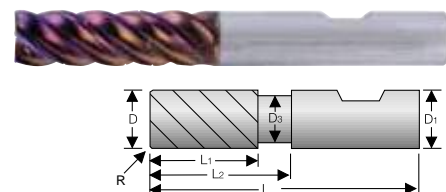
material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				● 150												● 130	● 100	● 100

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

**3 x D with clearance**

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
6	6	5.8	65	19	25	0.1	5	0.04	257190 0060	73,50
8	8	7.8	68	26	30	0.2	5	0.05	257190 0080	95,40
10	10	9.8	80	32	35	0.2	5	0.055	257190 0100	124,-
12	12	11.8	93	38	45	0.3	5	0.065	257190 0120	149,-
16	16	15.8	110	50	55	0.3	5	0.075	257190 0160	255,-
20	20	19.8	126	62	70	0.3	5	0.085	257190 0200	390,-

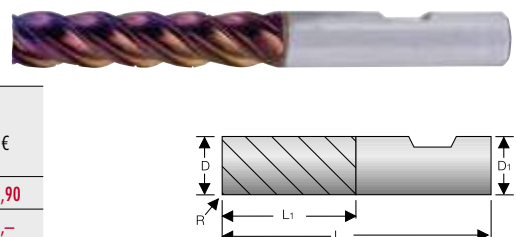
2178



**4 x D without clearance**

D mm	D1 mm	L mm	L1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
6	6	70	25	0.1	4	0.04	257195 0060	81,90
8	8	80	34	0.2	4	0.05	257195 0080	108,-
10	10	95	42	0.2	4	0.055	257195 0100	141,-
12	12	105	50	0.3	4	0.065	257195 0120	166,-
16	16	125	66	0.3	4	0.075	257195 0160	290,-
20	20	150	82	0.3	4	0.085	257195 0200	450,-

2178



# Cutting fluid maintenance

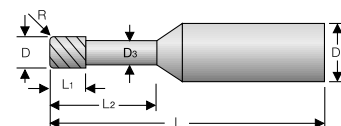




# ATORN® Mini torus milling cutter RockTec PRO



- For machining materials from 47 to 65 HRC
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



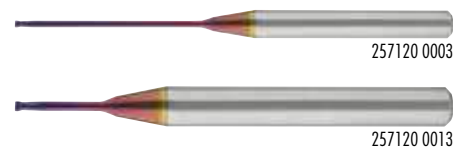
material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
			< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	G6/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
					●													●	●	●
					60-130													60-150	80-150	120-200

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Corner radius 0.05

D	D1	D3	L	L1	L2	Z	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm		mm	hardened steel < 60 HRC mm/tooth		
0.2	4	0.18	50	0.2	0.5	2	0.05	0.002	257120 0001	64,90
0.2	4	0.18	50	0.2	1	2	0.05	0.002	257120 0002	64,90
0.2	4	0.18	50	0.2	3	2	0.05	0.002	257120 0003	64,90
0.3	4	0.28	50	0.3	1	2	0.05	0.003	257120 0004	64,90
0.3	4	0.28	50	0.3	2	2	0.05	0.003	257120 0005	64,90
0.3	4	0.28	50	0.3	4	2	0.05	0.003	257120 0006	64,90
0.4	4	0.38	50	0.4	1	2	0.05	0.004	257120 0007	64,90
0.4	4	0.38	50	0.4	2	2	0.05	0.004	257120 0008	64,90
0.4	4	0.38	50	0.4	5	2	0.05	0.004	257120 0009	64,90
0.5	4	0.48	50	0.5	1	2	0.05	0.005	257120 0010	52,50
0.5	4	0.48	50	0.5	2	2	0.05	0.005	257120 0011	52,50
0.5	4	0.48	50	0.5	4	2	0.05	0.005	257120 0012	52,50
0.5	4	0.48	50	0.5	6	2	0.05	0.005	257120 0013	52,50
0.5	4	0.48	50	0.5	8	2	0.05	0.005	257120 0014	52,50
0.5	4	0.48	50	0.5	10	2	0.05	0.005	257120 0015	52,50

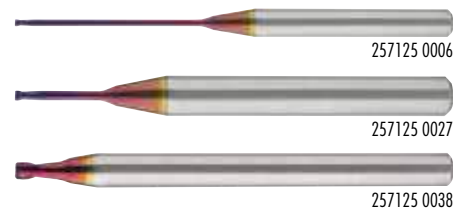
2178



## Corner radius 0.1

D	D1	D3	L	L1	L2	Z	R	Feed fz	art.no.	€
mm	mm	mm	mm	mm	mm		mm	hardened steel < 60 HRC mm/tooth		
0.5	4	0.48	50	0.5	1	2	0.1	0.005	257125 0001	52,50
0.5	4	0.48	50	0.5	2	2	0.1	0.005	257125 0002	52,50
0.5	4	0.48	50	0.5	4	2	0.1	0.005	257125 0003	52,50
0.5	4	0.48	50	0.5	6	2	0.1	0.005	257125 0004	52,50
0.5	4	0.48	50	0.5	8	2	0.1	0.005	257125 0005	52,50
0.5	4	0.48	50	0.5	10	2	0.1	0.005	257125 0006	52,50
0.6	4	0.58	50	0.6	2	2	0.1	0.006	257125 0007	52,50
0.6	4	0.58	50	0.6	4	2	0.1	0.006	257125 0008	52,50
0.6	4	0.58	50	0.6	6	2	0.1	0.006	257125 0009	52,50
0.6	4	0.58	50	0.6	8	2	0.1	0.006	257125 0010	52,50
0.6	4	0.58	50	0.6	10	2	0.1	0.006	257125 0011	52,50
0.8	4	0.78	50	0.8	2	2	0.1	0.007	257125 0012	55,-
0.8	4	0.78	50	0.8	4	2	0.1	0.007	257125 0013	55,-
0.8	4	0.78	50	0.8	6	2	0.1	0.007	257125 0014	55,-
0.8	4	0.78	50	0.8	8	2	0.1	0.007	257125 0015	55,-
0.8	4	0.78	50	0.8	10	2	0.1	0.007	257125 0016	55,-
1	4	0.95	50	1	2	2	0.1	0.008	257125 0017	49,90
1	4	0.95	50	1	4	2	0.1	0.008	257125 0018	49,90
1	4	0.95	50	1	6	2	0.1	0.008	257125 0019	49,90
1	4	0.95	50	1	8	2	0.1	0.008	257125 0020	49,90
1	4	0.95	50	1	10	2	0.1	0.008	257125 0021	49,90
1	4	0.95	50	1	15	2	0.1	0.008	257125 0022	64,90
1	4	0.95	60	1	20	2	0.1	0.008	257125 0023	71,90

2178





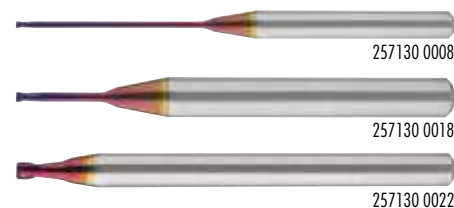
D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	4	0.95	60	1	25	2	0.1	0.008	257125 0024	71,90
1.2	4	1.14	50	1.2	5	2	0.1	0.010	257125 0025	55,-
1.2	4	1.14	50	1.2	10	2	0.1	0.010	257125 0026	55,-
1.2	4	1.14	50	1.2	15	2	0.1	0.010	257125 0027	71,90
1.2	4	1.14	60	1.2	20	2	0.1	0.010	257125 0028	71,90
1.2	4	1.14	60	1.2	25	2	0.1	0.010	257125 0029	71,90
1.5	4	1.44	50	1.5	3	2	0.1	0.012	257125 0030	52,50
1.5	4	1.44	50	1.5	4	2	0.1	0.012	257125 0031	52,50
1.5	4	1.44	50	1.5	6	2	0.1	0.012	257125 0032	52,50
1.5	4	1.44	50	1.5	8	2	0.1	0.012	257125 0033	52,50
1.5	4	1.44	50	1.5	10	2	0.1	0.012	257125 0034	52,50
1.5	4	1.44	50	1.5	15	2	0.1	0.012	257125 0035	55,-
1.5	4	1.44	60	1.5	20	2	0.1	0.012	257125 0036	55,-
1.5	4	1.44	60	1.5	25	2	0.1	0.012	257125 0037	55,-
2	4	1.91	50	2	4	2	0.1	0.013	257125 0038	52,50

2178

## Corner radius 0.2

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	4	0.95	50	1	2	2	0.2	0.008	<b>257130 0001</b>	49,90
1	4	0.95	50	1	4	2	0.2	0.008	257130 0002	49,90
1	4	0.95	50	1	6	2	0.2	0.008	257130 0003	49,90
1	4	0.95	50	1	8	2	0.2	0.008	257130 0004	49,90
1	4	0.95	50	1	10	2	0.2	0.008	257130 0005	49,90
1	4	0.95	50	1	15	2	0.2	0.008	257130 0006	64,90
1	4	0.95	60	1	20	2	0.2	0.008	257130 0007	71,90
1	4	0.95	60	1	25	2	0.2	0.008	257130 0008	71,90
1.2	4	1.14	50	1.2	5	2	0.2	0.010	257130 0009	55,-
1.2	4	1.14	50	1.2	10	2	0.2	0.010	257130 0010	55,-
1.2	4	1.14	50	1.2	15	2	0.2	0.010	257130 0011	71,90
1.2	4	1.14	60	1.2	20	2	0.2	0.010	257130 0012	71,90
1.2	4	1.14	60	25	25	2	0.2	0.010	257130 0013	71,90
1.5	4	1.44	50	1.5	3	2	0.2	0.012	257130 0014	52,50
1.5	4	1.44	50	1.5	4	2	0.2	0.012	257130 0015	52,50
1.5	4	1.44	50	1.5	6	2	0.2	0.012	257130 0016	52,50
1.5	4	1.44	50	1.5	8	2	0.2	0.012	257130 0017	52,50
1.5	4	1.44	50	1.5	10	2	0.2	0.012	257130 0018	52,50
1.5	4	1.44	50	1.5	15	2	0.2	0.012	257130 0019	55,-
1.5	4	1.44	60	1.5	20	2	0.2	0.012	257130 0020	55,-
1.5	4	1.44	60	1.5	25	2	0.2	0.012	257130 0021	55,-
2	4	1.91	50	2	4	2	0.2	0.016	257130 0022	52,50
2	4	1.91	50	2	6	2	0.2	0.016	257130 0023	52,50
2	4	1.91	50	2	8	2	0.2	0.016	257130 0024	52,50
2	4	1.91	50	2	10	2	0.2	0.016	257130 0025	52,50
2	4	1.91	50	2	15	2	0.2	0.016	257130 0026	55,-
2	4	1.91	60	2	20	2	0.2	0.016	257130 0027	55,-
2	4	1.91	60	2	25	2	0.2	0.016	257130 0028	55,-
2	4	1.91	65	2	30	2	0.2	0.016	257130 0029	64,90
2	4	1.91	70	2	35	2	0.2	0.016	257130 0030	71,90
2	4	1.91	75	2	40	2	0.2	0.016	257130 0031	71,90

2178



Continued on next page &gt;&gt;&gt;

## Corner radius 0.3

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1.5	4	1.44	50	1.5	3	2	0.3	0.012	<b>257135 0001</b>	<b>52,50</b>
1.5	4	1.44	50	1.5	4	2	0.3	0.012	257135 0002	<b>52,50</b>
1.5	4	1.44	50	1.5	6	2	0.3	0.012	257135 0003	<b>52,50</b>
1.5	4	1.44	50	1.5	8	2	0.3	0.012	257135 0004	<b>52,50</b>
1.5	4	1.44	50	1.5	10	2	0.3	0.012	257135 0005	<b>52,50</b>
1.5	4	1.44	50	1.5	15	2	0.3	0.012	257135 0006	<b>55,-</b>
1.5	4	1.44	60	1.5	20	2	0.3	0.012	257135 0007	<b>55,-</b>
1.5	4	1.44	60	1.5	25	2	0.3	0.012	257135 0008	<b>55,-</b>
2	4	1.91	50	2	4	2	0.3	0.016	257135 0009	<b>52,50</b>
2	4	1.91	50	2	6	2	0.3	0.016	257135 0010	<b>52,50</b>
2	4	1.91	50	2	8	2	0.3	0.016	257135 0011	<b>52,50</b>
2	4	1.91	50	2	10	2	0.3	0.016	257135 0012	<b>52,50</b>
2	4	1.91	50	2	15	2	0.3	0.016	257135 0013	<b>55,-</b>
2	4	1.91	60	2	20	2	0.3	0.016	257135 0014	<b>55,-</b>
2	4	1.91	60	2	25	2	0.3	0.016	257135 0015	<b>55,-</b>
2	4	1.91	65	2	30	2	0.3	0.016	257135 0016	<b>64,90</b>
2	4	1.91	70	2	35	2	0.3	0.016	257135 0017	<b>71,90</b>
2	4	1.91	75	2	40	2	0.3	0.016	257135 0018	<b>71,90</b>
2.5	4	2.41	50	2.5	8	2	0.3	0.018	257135 0019	<b>52,50</b>
2.5	4	2.41	50	2.5	10	2	0.3	0.018	257135 0020	<b>52,50</b>
2.5	4	2.41	50	2.5	15	2	0.3	0.018	257135 0021	<b>55,-</b>
2.5	4	2.41	60	2.5	20	2	0.3	0.018	257135 0022	<b>55,-</b>
2.5	4	2.41	60	2.5	25	2	0.3	0.018	257135 0023	<b>55,-</b>
2.5	4	2.41	65	2.5	30	2	0.3	0.018	257135 0024	<b>64,90</b>
2.5	4	2.41	70	2.5	35	2	0.3	0.018	257135 0025	<b>71,90</b>
2.5	4	2.41	75	2.5	40	2	0.3	0.018	257135 0026	<b>71,90</b>
3	4	2.92	50	3	8	2	0.3	0.020	257135 0027	<b>55,-</b>
3	4	2.92	50	3	10	2	0.3	0.020	257135 0028	<b>55,-</b>
3	4	2.92	50	3	15	2	0.3	0.020	257135 0029	<b>55,-</b>
3	4	2.92	60	3	20	2	0.3	0.020	257135 0030	<b>59,20</b>
3	4	2.92	60	3	25	2	0.3	0.020	257135 0031	<b>59,20</b>
3	4	2.92	65	3	30	2	0.3	0.020	257135 0032	<b>71,90</b>
3	4	2.92	70	3	35	2	0.3	0.020	257135 0033	<b>71,90</b>
3	4	2.92	75	3	40	2	0.3	0.020	257135 0034	<b>71,90</b>

2178



## Corner radius 0.5

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2.5	4	2.41	50	2.5	8	2	0.5	0.018	<b>257140 0001</b>	<b>52,50</b>
2.5	4	2.41	50	2.5	10	2	0.5	0.018	257140 0002	<b>52,50</b>
2.5	4	2.41	50	2.5	15	2	0.5	0.018	257140 0003	<b>55,-</b>
2.5	4	2.41	60	2.5	20	2	0.5	0.018	257140 0004	<b>55,-</b>
2.5	4	2.41	60	2.5	25	2	0.5	0.018	257140 0005	<b>55,-</b>
2.5	4	2.41	65	2.5	30	2	0.5	0.018	257140 0006	<b>64,90</b>
2.5	4	2.41	70	2.5	35	2	0.5	0.018	257140 0007	<b>71,90</b>
2.5	4	2.41	75	2.5	40	2	0.5	0.018	257140 0008	<b>71,90</b>
3	4	2.92	50	3	8	2	0.5	0.020	257140 0009	<b>55,-</b>
3	4	2.92	50	3	10	2	0.5	0.020	257140 0010	<b>55,-</b>
3	4	2.92	50	3	15	2	0.5	0.020	257140 0011	<b>55,-</b>
3	4	2.92	60	3	20	2	0.5	0.020	257140 0012	<b>59,20</b>
3	4	2.92	60	3	25	2	0.5	0.020	257140 0013	<b>59,20</b>
3	4	2.92	65	3	30	2	0.5	0.020	257140 0014	<b>71,90</b>
3	4	2.92	70	3	35	2	0.5	0.020	257140 0015	<b>71,90</b>
3	4	2.92	75	3	40	2	0.5	0.020	257140 0016	<b>71,90</b>

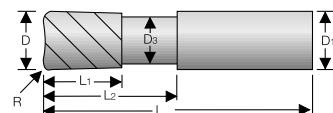
2178



# ATORN® Torus milling cutter RockTec PRO



- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	G6/G15	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
				● 60-130												● 60-150	● 80-150	● 120-200	
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																			

## Standard

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.95	57	1.5	10	4	0.1	0.008	257145 0101	46,80
1	6	0.95	57	1.5	10	4	0.2	0.008	257145 0102	46,80
2	6	1.85	57	2.5	12	4	0.1	0.016	257145 0201	46,80
2	6	1.85	57	2.5	12	4	0.3	0.016	257145 0203	46,50
2	6	1.85	57	2.5	12	4	0.5	0.016	257145 0205	46,50
3	6	2.9	57	3.5	12	4	0.1	0.020	257145 0301	43,40
3	6	2.9	57	3.5	12	4	0.3	0.020	257145 0303	43,40
3	6	2.9	57	3.5	12	4	0.5	0.020	257145 0305	43,40
3	6	2.9	57	3.5	12	4	1	0.020	257145 0310	43,40
4	6	3.8	57	4.5	14	4	0.1	0.030	257145 0401	46,80
4	6	3.8	57	4.5	14	4	0.3	0.030	257145 0403	46,80
4	6	3.8	57	4.5	14	4	0.5	0.030	257145 0405	46,80
4	6	3.8	57	4.5	14	4	1	0.030	257145 0410	46,80
5	6	4.7	57	5.5	16	4	0.1	0.035	257145 0501	51,10
5	6	4.7	57	5.5	16	4	0.3	0.035	257145 0503	51,10
5	6	4.7	57	5.5	16	4	0.5	0.035	257145 0505	51,10
5	6	4.7	57	5.5	16	4	1	0.035	257145 0510	51,10
6	6	5.7	57	7	20	4	0.1	0.040	257145 0601	59,20
6	6	5.7	57	7	20	4	0.3	0.040	257145 0603	59,20
6	6	5.7	57	7	20	4	0.5	0.040	257145 0605	58,20
6	6	5.7	57	7	20	4	1	0.040	257145 0610	58,20
6	6	5.7	57	7	20	4	1.5	0.040	257145 0615	58,20
6	6	5.7	57	7	20	4	2	0.040	257145 0620	58,20
8	8	7.6	63	9	26	4	0.1	0.050	257145 0801	76,30
8	8	7.6	63	9	26	4	0.3	0.050	257145 0803	76,30
8	8	7.6	63	9	26	4	0.5	0.050	257145 0805	76,30
8	8	7.6	63	9	26	4	1	0.050	257145 0810	76,30
8	8	7.6	63	9	26	4	2	0.050	257145 0820	76,30
8	8	7.6	63	9	26	4	3	0.050	257145 0830	76,30
10	10	9.6	72	12	32	4	0.1	0.055	257145 1001	101,-
10	10	9.6	72	12	32	4	0.3	0.055	257145 1003	101,-
10	10	9.6	72	12	32	4	0.5	0.055	257145 1005	101,-
10	10	9.6	72	12	32	4	1	0.055	257145 1010	101,-
10	10	9.6	72	12	32	4	2	0.055	257145 1020	101,-
10	10	9.6	72	12	32	4	3	0.055	257145 1030	101,-
12	12	11.6	83	14	38	4	0.5	0.065	257145 1205	137,-
12	12	11.6	83	14	38	4	1	0.065	257145 1210	137,-
12	12	11.6	83	14	38	4	2	0.065	257145 1220	137,-
12	12	11.6	83	14	38	4	3	0.065	257145 1230	137,-
16	16	15.4	92	18	44	4	1	0.075	257145 1610	232,-
16	16	15.4	92	18	44	4	2	0.075	257145 1620	232,-
16	16	15.4	92	18	44	4	3	0.075	257145 1630	232,-





## Long

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	R mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.95	65	1.5	20	4	0.1	0.008	<b>257150 0101</b>	<b>67,60</b>
1	6	0.95	65	1.5	20	4	0.2	0.008	257150 0102	67,60
2	6	1.85	70	2.5	25	4	0.1	0.016	257150 0201	66,40
2	6	1.85	70	2.5	25	4	0.3	0.016	257150 0203	66,40
2	6	1.85	70	2.5	25	4	0.5	0.016	257150 0205	66,40
3	6	2.9	75	3.5	32	4	0.1	0.020	257150 0301	60,90
3	6	2.9	75	3.5	32	4	0.3	0.020	257150 0303	60,90
3	6	2.9	75	3.5	32	4	0.5	0.020	257150 0305	60,90
3	6	2.9	75	3.5	32	4	1	0.020	257150 0310	60,90
4	6	3.8	80	4.5	36	4	0.1	0.030	257150 0401	68,20
4	6	3.8	80	4.5	36	4	0.3	0.030	257150 0403	68,20
4	6	3.8	80	4.5	36	4	0.5	0.030	257150 0405	68,20
4	6	3.8	80	4.5	36	4	1	0.030	257150 0410	68,20
5	6	4.7	80	5.5	40	4	0.1	0.035	257150 0501	74,50
5	6	4.7	80	5.5	40	4	0.3	0.035	257150 0503	74,50
5	6	4.7	80	5.5	40	4	0.5	0.035	257150 0505	74,50
5	6	4.7	80	5.5	40	4	1	0.035	257150 0510	74,50
6	6	5.7	80	7	44	4	0.1	0.040	257150 0601	80,60
6	6	5.7	80	7	44	4	0.3	0.040	257150 0603	80,60
6	6	5.7	80	7	44	4	0.5	0.040	257150 0605	80,60
6	6	5.7	80	7	44	4	1	0.040	257150 0610	80,60
6	6	5.7	80	7	44	4	1.5	0.040	257150 0615	80,60
6	6	5.7	80	7	44	4	2	0.040	257150 0620	80,60
8	8	7.6	100	9	54	4	0.1	0.050	257150 0801	113,50
8	8	7.6	100	9	54	4	0.3	0.050	257150 0803	113,50
8	8	7.6	100	9	54	4	0.5	0.050	257150 0805	113,50
8	8	7.6	100	9	54	4	1	0.050	257150 0810	113,50
8	8	7.6	100	9	54	4	2	0.050	257150 0820	113,50
8	8	7.6	100	9	54	4	3	0.050	257150 0830	113,50
10	10	9.6	100	12	60	4	0.1	0.055	257150 1001	151,50
10	10	9.6	100	12	60	4	0.3	0.055	257150 1003	151,50
10	10	9.6	100	12	60	4	0.5	0.055	257150 1005	151,50
10	10	9.6	100	12	60	4	1	0.055	257150 1010	151,50
10	10	9.6	100	12	60	4	2	0.055	257150 1020	151,50
10	10	9.6	100	12	60	4	3	0.055	257150 1030	151,50
12	12	11.6	120	14	75	4	0.5	0.065	257150 1205	201,-
12	12	11.6	120	14	75	4	1	0.065	257150 1210	201,-
12	12	11.6	120	14	75	4	2	0.065	257150 1220	201,-
12	12	11.6	120	14	75	4	3	0.065	257150 1230	201,-
16	16	15.4	150	18	92	4	1	0.075	257150 1610	342,-
16	16	15.4	150	18	92	4	2	0.075	257150 1620	342,-
16	16	15.4	150	18	92	4	3	0.075	257150 1630	342,-

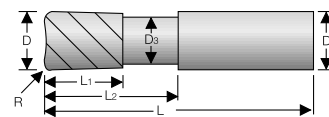
2178

# ATORN® RockTec PRO torus face milling cutter

**NEW**



- For machining materials **from 47 to 65 HRC**
- **4 cutting edges, face-cutter geometry for immersing**
- Optimised geometry for hard machining
- Straight shank, suitable for use in shrink fit holders
- **Solid carbide ultra-fine grain cutting material**
- State-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo	< 55 HRc	< 60 HRc	≥ 60 HRc
257200....				●													●	●	●
				190													150	120	120
257205....				●													●	●	●
				160													120	90	90

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Standard

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2	6	1.7	57	1.5	13	0.25	4	0.015	<b>257200 0020</b>	<b>61,30</b>
3	6	2.7	57	1.5	15	0.3	4	0.04	257200 0030	61,30
4	6	3.6	57	2.5	16	0.4	4	0.055	257200 0040	61,30
5	6	4.6	57	3.5	18	0.5	4	0.065	257200 0050	61,30
6	6	5.2	57	3.5	20	0.6	4	0.07	257200 0060	61,30
8	8	7	63	4.8	24	1.2	4	0.10	257200 0080	68,80
10	10	9	72	5.8	26	1.8	4	0.13	257200 0100	106,-
12	12	11	83	6.8	30	1.9	4	0.15	257200 0120	141,50
16	16	14.5	92	8.8	35	2.1	4	0.18	257200 0160	141,50

2178



## Long

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2	6	1.7	75	1.5	18	0.25	4	0.005-0.020	<b>257205 0020</b>	<b>71,90</b>
3	6	2.7	75	1.5	20	0.3	4	0.030-0.050	257205 0030	71,90
4	6	3.6	85	2.5	24	0.4	4	0.040-0.060	257205 0040	76,50
5	6	4.6	100	3.5	28	0.5	4	0.050-0.070	257205 0050	76,50
6	6	5.2	100	3.5	28	0.6	4	0.060-0.085	257205 0060	76,50
8	8	7	100	4.8	40	1.2	4	0.085-0.110	257205 0080	96,70
10	10	9	100	5.8	48	1.8	4	0.115-0.150	257205 0100	134,-
12	12	11	120	6.8	56	1.9	4	0.135-0.170	257205 0120	175,50

2178



Precision ...

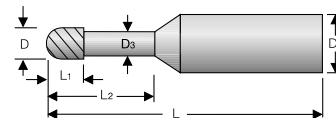
... but digital.

**ATORN®**  
Performance demands quality

# ATORN® Mini radius milling cutter RockTec PRO



- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 Hrc	≥ 30 Hrc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo	< 55 Hrc	< 60 Hrc	≥ 60 Hrc
				● 60-130													● 60-150	● 80-150	● 120-200

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Standard

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
0.1	4	0.08	50	0.08	0.3	2	0.001	257100 0001	76,90
0.1	4	0.08	50	0.08	0.5	2	0.001	257100 0002	76,90
0.1	4	0.08	50	0.08	1	2	0.001	257100 0003	76,90
0.2	4	0.17	50	0.16	0.5	2	0.002	257100 0004	64,90
0.2	4	0.17	50	0.16	1	2	0.002	257100 0005	64,90
0.2	4	0.17	50	0.16	2	2	0.002	257100 0006	64,90
0.2	4	0.17	50	0.16	3	2	0.002	257100 0007	64,90
0.3	4	0.27	50	0.24	0.5	2	0.003	257100 0008	64,90
0.3	4	0.27	50	0.24	1	2	0.003	257100 0009	64,90
0.3	4	0.27	50	0.24	2	2	0.003	257100 0010	64,90
0.3	4	0.27	50	0.24	3	2	0.003	257100 0011	64,90
0.3	4	0.27	50	0.24	4	2	0.003	257100 0012	64,90
0.4	4	0.37	50	0.32	1	2	0.004	257100 0013	64,90
0.4	4	0.37	50	0.32	2	2	0.004	257100 0014	64,90
0.4	4	0.37	50	0.32	3	2	0.004	257100 0015	64,90
0.4	4	0.37	50	0.32	4	2	0.004	257100 0016	64,90
0.4	4	0.37	50	0.32	5	2	0.004	257100 0017	64,90
0.4	4	0.37	50	0.32	6	2	0.004	257100 0018	64,90
0.5	4	0.47	50	0.4	1	2	0.005	257100 0019	52,50
0.5	4	0.47	50	0.4	2	2	0.005	257100 0020	52,50
0.5	4	0.47	50	0.4	3	2	0.005	257100 0021	52,50
0.5	4	0.47	50	0.4	4	2	0.005	257100 0022	52,50
0.5	4	0.47	50	0.4	5	2	0.005	257100 0023	52,50
0.5	4	0.47	50	0.4	6	2	0.005	257100 0024	52,50
0.5	4	0.47	50	0.4	8	2	0.005	257100 0025	52,50
0.5	4	0.47	50	0.4	10	2	0.005	257100 0026	52,50
0.6	4	0.57	50	0.48	2	2	0.006	257100 0027	52,50
0.6	4	0.57	50	0.48	4	2	0.006	257100 0028	52,50
0.6	4	0.57	50	0.48	6	2	0.006	257100 0029	52,50
0.6	4	0.57	50	0.48	8	2	0.006	257100 0030	52,50
0.6	4	0.57	50	0.48	10	2	0.006	257100 0031	52,50
0.8	4	0.77	50	0.64	2	2	0.007	257100 0032	55,-
0.8	4	0.77	50	0.64	4	2	0.007	257100 0033	55,-
0.8	4	0.77	50	0.64	6	2	0.007	257100 0034	55,-
0.8	4	0.77	50	0.64	8	2	0.007	257100 0035	55,-
0.8	4	0.77	50	0.64	10	2	0.007	257100 0036	55,-
1	4	0.96	50	0.8	2	2	0.007	257100 0037	49,90
1	4	0.96	50	0.8	4	2	0.008	257100 0038	49,90
1	4	0.96	50	0.8	6	2	0.008	257100 0039	49,90
1	4	0.96	50	0.8	8	2	0.008	257100 0040	49,90
1	4	0.96	50	0.8	10	2	0.008	257100 0041	49,90



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	 Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	4	0.96	50	0.8	15	2	0.008	257100 0042	55,-
1	4	0.96	60	0.8	20	2	0.008	257100 0043	64,90
1	4	0.96	60	0.8	25	2	0.008	257100 0044	71,90
1.2	4	1.16	50	0.96	2	2	0.010	257100 0045	52,50
1.2	4	1.16	50	0.96	4	2	0.010	257100 0046	52,50
1.2	4	1.16	50	0.96	6	2	0.010	257100 0047	52,50
1.2	4	1.16	50	0.96	8	2	0.010	257100 0048	52,50
1.2	4	1.16	50	0.96	10	2	0.010	257100 0049	55,-
1.2	4	1.16	50	0.96	15	2	0.010	257100 0050	55,-
1.2	4	1.16	60	0.96	20	2	0.010	257100 0051	64,90
1.2	4	1.16	60	0.96	25	2	0.010	257100 0052	71,90
1.5	4	1.44	50	1.2	3	2	0.012	257100 0053	52,50
1.5	4	1.44	50	1.2	4	2	0.012	257100 0054	52,50
1.5	4	1.44	50	1.2	6	2	0.012	257100 0055	52,50
1.5	4	1.44	50	1.2	8	2	0.012	257100 0056	52,50
1.5	4	1.44	50	1.2	10	2	0.012	257100 0057	52,50
1.5	4	1.44	50	1.2	15	2	0.012	257100 0058	55,-
1.5	4	1.44	60	1.2	20	2	0.012	257100 0059	64,90
1.5	4	1.44	60	1.2	25	2	0.012	257100 0060	71,90
1.6	4	1.54	50	1.28	4	2	0.012	257100 0061	55,-
1.6	4	1.54	50	1.28	8	2	0.012	257100 0062	55,-
1.6	4	1.54	50	1.28	10	2	0.012	257100 0063	55,-
1.6	4	1.54	50	1.28	15	2	0.012	257100 0064	55,-
1.6	4	1.54	60	1.28	20	2	0.012	257100 0065	64,90
1.6	4	1.54	60	1.28	25	2	0.012	257100 0066	71,90
1.8	4	1.74	50	1.44	8	2	0.014	257100 0067	55,-
1.8	4	1.74	50	1.44	10	2	0.014	257100 0068	55,-
1.8	4	1.74	50	1.44	15	2	0.014	257100 0069	55,-
1.8	4	1.74	60	1.44	20	2	0.014	257100 0070	64,90
1.8	4	1.74	60	1.44	25	2	0.016	257100 0071	71,90
2	4	1.94	50	1.6	4	2	0.016	257100 0072	52,50
2	4	1.94	50	1.6	6	2	0.016	257100 0073	52,50
2	4	1.94	50	1.6	8	2	0.016	257100 0074	52,50
2	4	1.94	50	1.6	10	2	0.016	257100 0075	52,50
2	4	1.94	50	1.6	15	2	0.016	257100 0076	52,50
2	4	1.94	60	1.6	20	2	0.016	257100 0077	64,90
2	4	1.94	60	1.6	25	2	0.016	257100 0078	64,90
2	4	1.94	65	1.6	30	2	0.016	257100 0079	71,90
2	4	1.94	70	1.6	35	2	0.016	257100 0080	76,90
2	4	1.94	75	1.6	40	2	0.016	257100 0081	76,90
2.5	4	2.41	50	2	6	2	0.018	257100 0082	55,-
2.5	4	2.41	50	2	8	2	0.018	257100 0083	55,-
2.5	4	2.41	50	2	10	2	0.018	257100 0084	55,-
2.5	4	2.41	50	2	15	2	0.018	257100 0085	59,20
2.5	4	2.41	60	2	20	2	0.018	257100 0086	64,90
2.5	4	2.41	60	2	25	2	0.018	257100 0087	71,90
2.5	4	2.41	65	2	30	2	0.018	257100 0088	71,90
2.5	4	2.41	70	2	35	2	0.018	257100 0089	76,90
2.5	4	2.41	75	2	40	2	0.018	257100 0090	76,90
3	4	2.92	50	3.5	6	2	0.020	257100 0091	55,-
3	4	2.92	50	3.5	8	2	0.020	257100 0092	55,-
3	4	2.92	50	3.5	10	2	0.020	257100 0093	55,-
3	4	2.92	50	3.5	15	2	0.020	257100 0094	59,20
3	4	2.92	60	3.5	20	2	0.020	257100 0095	64,90
3	4	2.92	60	3.5	25	2	0.020	257100 0096	64,90
3	4	2.92	65	3.5	30	2	0.020	257100 0097	71,90
3	4	2.92	70	3.5	35	2	0.020	257100 0098	71,90
3	4	2.92	75	3.5	40	2	0.020	257100 0099	71,90

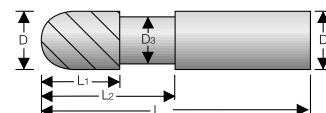
2178



# ATORN® Radius milling cutter RockTec PRO



- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC	
				●												●	●	●	
				60-130												60-150	80-150	120-200	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	57	1.5	3.5	2	0.008	<b>257105 0010</b>	<b>51,30</b>
1.5	6	1.44	57	1.5	4	2	0.012	257105 0015	<b>49,60</b>
2	6	1.95	57	2	4.5	2	0.016	257105 0020	<b>48,90</b>
2.5	6	-	57	3	-	2	0.018	257105 0025	<b>48,90</b>
3	6	-	57	3.5	-	2	0.020	257105 0030	<b>48,-</b>
4	6	-	57	4.5	-	2	0.030	257105 0040	<b>48,-</b>
5	6	-	57	5.5	-	2	0.035	257105 0050	<b>47,50</b>
6	6	-	57	7	-	2	0.040	257105 0060	<b>47,30</b>
8	8	-	70	9	-	2	0.050	257105 0080	<b>59,20</b>
10	10	-	72	12	-	2	0.055	257105 0100	<b>80,40</b>
12	12	-	83	14	-	2	0.065	257105 0120	<b>108,50</b>
16	16	-	92	18	-	2	0.075	257105 0160	<b>181,50</b>
20	20	-	104	22	-	2	0.085	257105 0200	<b>286,-</b>



2178

## Standard

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	65	1.5	3.5	2	0.008	<b>257110 0010</b>	<b>63,10</b>
1.5	6	1.44	65	2	4	2	0.012	257110 0015	<b>61,80</b>
2	6	1.95	65	2.5	4.5	2	0.016	257110 0020	<b>61,30</b>
2.5	6	-	65	3	-	2	0.018	257110 0025	<b>60,30</b>
3	6	-	65	3.5	-	2	0.020	257110 0030	<b>59,70</b>
4	6	-	65	4.5	-	2	0.030	257110 0040	<b>59,20</b>
5	6	-	65	5.5	-	2	0.035	257110 0050	<b>58,10</b>
6	6	-	65	7	-	2	0.040	257110 0060	<b>56,60</b>
8	8	-	85	9	-	2	0.050	257110 0080	<b>71,70</b>
10	10	-	85	12	-	2	0.055	257110 0100	<b>94,60</b>
12	12	-	93	14	-	2	0.065	257110 0120	<b>125,50</b>
16	16	-	110	18	-	2	0.075	257110 0160	<b>239,-</b>
20	20	-	126	22	-	2	0.085	257110 0200	<b>343,-</b>

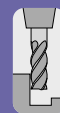


2178

## Long

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	80	1.5	3.5	2	0.008	<b>257115 0010</b>	<b>74,70</b>
1.5	6	1.44	80	2	4	2	0.012	257115 0015	74,50
2	6	1.95	80	2.5	4.5	2	0.016	257115 0020	73,70
2.5	6	-	80	3	-	2	0.018	257115 0025	72,30
3	6	-	80	3.5	-	2	0.020	257115 0030	71,40
4	6	-	80	3.5	-	2	0.030	257115 0040	71,-
5	6	-	80	5.5	-	2	0.035	257115 0050	69,20
6	6	-	80	7	-	2	0.040	257115 0060	66,60
8	8	-	100	9	-	2	0.050	257115 0080	84,50
10	10	-	100	12	-	2	0.055	257115 0100	108,50
12	12	-	100	14	-	2	0.065	257115 0120	141,50
16	16	-	150	18	-	2	0.075	257115 0160	282,-
20	20	-	150	22	-	2	0.085	257115 0200	395,-

2178



YOUR DRILL  
**GIVES UP.** • WHAT DO YOU DO? YOU REACH  
**FOR A NEW ONE**

AND SIMPLY CARRY ON:  
**SARA®GO TOOL DISPENSING SYSTEM.**

THAT'S POWER TO PRODUCE

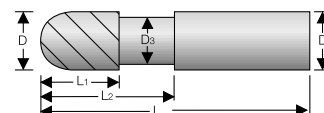
**SARATOOLS.com**  
**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

# ATORN® RockTec PRO radius milling cutter



- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Solid carbide ultra-fine grain cutting material**
- State-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si				< 55 HRc	< 60 HRc	≥ 60 HRc
				● 60-130													● 60-150	● 80-150	● 120-200

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Short

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	57	1.5	3.5	4	0.008	<b>257106 0010</b>	<b>52,90</b>
1.5	6	1.44	57	1.5	4	4	0.012	257106 0015	<b>52,90</b>
2	6	1.95	57	2	4.5	4	0.016	257106 0020	<b>50,90</b>
2.5	6	-	57	3	6.5	4	0.018	257106 0025	<b>50,90</b>
3	6	-	57	3.5	7	4	0.02	257106 0030	<b>49,80</b>
4	6	-	57	4.5	7	4	0.03	257106 0040	<b>49,80</b>
5	6	-	57	5.5	10	4	0.035	257106 0050	<b>49,-</b>
6	6	-	57	7	-	4	0.04	257106 0060	<b>48,90</b>
8	8	-	70	9	-	4	0.05	257106 0080	<b>60,90</b>
10	10	-	72	12	-	4	0.055	257106 0100	<b>83,-</b>
12	12	-	83	14	-	4	0.065	257106 0120	<b>112,50</b>
16	16	-	92	18	-	4	0.075	257106 0160	<b>177,-</b>
20	20	-	104	22	-	4	0.085	257106 0200	<b>279,-</b>

2178

## Standard

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	80	1.5	3.5	4	0.008	<b>257111 0010</b>	<b>74,80</b>
1.5	6	1.44	65	2	4	4	0.012	257111 0015	<b>74,80</b>
2	6	1.95	65	2.5	4.5	4	0.016	257111 0020	<b>73,70</b>
2.5	6	-	65	3	6.5	4	0.018	257111 0025	<b>72,30</b>
3	6	-	65	3.5	7	4	0.02	257111 0030	<b>71,60</b>
4	6	-	65	4.5	7	4	0.03	257111 0040	<b>71,-</b>
5	6	-	65	5.5	10	4	0.035	257111 0050	<b>69,20</b>
6	6	-	65	7	-	4	0.04	257111 0060	<b>68,20</b>
8	8	-	85	9	-	4	0.05	257111 0080	<b>86,10</b>
10	10	-	85	12	-	4	0.055	257111 0100	<b>110,50</b>
12	12	-	93	14	-	4	0.065	257111 0120	<b>145,-</b>
16	16	-	110	18	-	4	0.075	257111 0160	<b>284,-</b>
20	20	-	126	22	-	4	0.085	257111 0200	<b>390,-</b>

2178



# ATORN® Machining of concentric sealing surfaces

INFO

### Cutting data

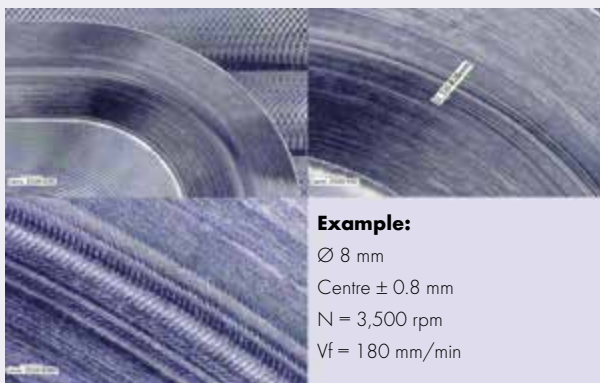
The following cutting data are recommended irrespective of the diameters used:

N	3500 rpm
Vf	180 mm/min
ae	max. 1 x D
ap roughing	max. 0.05 mm
ap finishing	0.005 mm (max. 0.01 mm)

Please adjust these guideline values for different applications and according to clamping operation and machine set-up!

### Entry and exit

Entry angle	max. 0.5°
Exit angle	max. 0.0115° (over 25 mm movement 0.005 mm retraction)



### Example:

Ø 8 mm  
Centre ± 0.8 mm  
N = 3,500 rpm  
Vf = 180 mm/min

### Important:

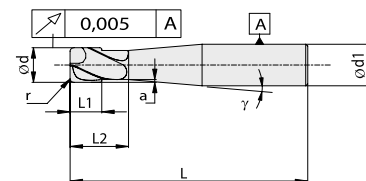
- The achievable planarity is 0.02 - 0.03 mm.
- The tool length must be measured at R0 (Blum laser, pre-setting device).
- The true running accuracy of the clamped tool must not be more than 0.005 mm.
- Circular orbits are visible at ae > 0.5 x D. This corresponds to no more than 10% of the diameter.

## ATORN® Sealing surface milling cutter



### • For manufacturing concentric sealing surfaces for high-quality products

- Only concentric milling contours
- No post-machining required
- Smooth surface
- Helix angle 30°



material	● very well suited ○ well suited		steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel	
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	< 55 HRc	< 60 HRc	≥ 60 HRc				
	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●

### uncoated

d mm	r mm	d1 mm	L mm	L1 mm	L2 mm	a mm	γ °	art.no.	€
3.0	0.02	6	51	1.0	4.0	0.05	15	255151 0030	69,70
4.0	0.03	6	51	2.0	4.0	0.05	15	255151 0040	69,70
5.0	0.03	6	51	2.0	4.0	0.05	15	255151 0050	75,80
6.0	0.06	6	51	4.0				255151 0060	81,40
8.0	0.08	8	64	6.0				255151 0080	108,-
10.0	0.1	10	64	7.0				255151 0100	140,50
12.0	0.12	12	73	9.0				255151 0120	195,50
16.0	0.14	16	89	12.0				255151 0160	285,-
20.0	0.15	20	102	15.0				255151 0200	380,-

2111



### coated

d mm	r mm	d1 mm	L mm	L1 mm	L2 mm	a mm	γ °	art.no.	€
3.0	0.02	6	51	1.0	4.0	0.05	15	255152 0030	69,70
4.0	0.05	6	51	2.0	4.0	0.05	15	255152 0040	77,30
5.0	0.05	6	51	2.0	4.0	0.05	15	255152 0050	91,10
6.0	0.1	6	51	4.0				255152 0060	98,70
8.0	0.1	8	64	6.0				255152 0080	122,50
10.0	0.15	10	64	7.0				255152 0100	157,-
12.0	0.15	12	73	9.0				255152 0120	224,-
16.0	0.15	16	89	12.0				255152 0160	321,-
20.0	0.2	20	102	15.0				255152 0200	425,-

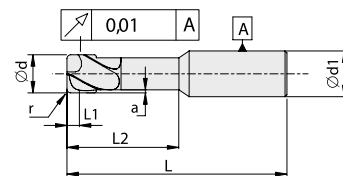
2111



## ATORN® Ceramics milling cutter



- Helix angle 15°
- For machining nickel-based alloys e.g. Inconel
- Always use air cooling
- Ensure continuous machining
- Do not remove the chips from the cutting area
- **Attention:** Tool, chips and workpiece can get very hot



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
											●	●								
											550	550								

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

d mm	r mm	d1 mm	L mm	L1 mm	L2 mm	a mm	art.no.	€
6.0	0.40	6	51	3.0	12.0	0.15	255153 0060	209,-
8.0	0.52	8	63	4.0	16.0	0.15	255153 0080	250,-
10.0	0.65	10	72	5.0	20.0	0.2	255153 0100	290,-
12.0	0.75	12	83	6.0	24.0	0.2	255153 0120	341,-
16.0	1.0	16	92	8.0	32.0	0.25	255153 0160	405,-
20.0	1.3	20	102	10.0	40.0	0.25	255153 0200	475,-

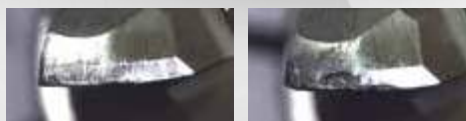


2177

## Comparison Ceramic milling cutters

- Inconel 718
- Material removal rate:  
competitor 17.5 mm<sup>3</sup>/min  
ATORN 20.5 mm<sup>3</sup>/min

### Competitor



3 m

30 m

### ATORN ceramic milling cutters



3 m

30 m

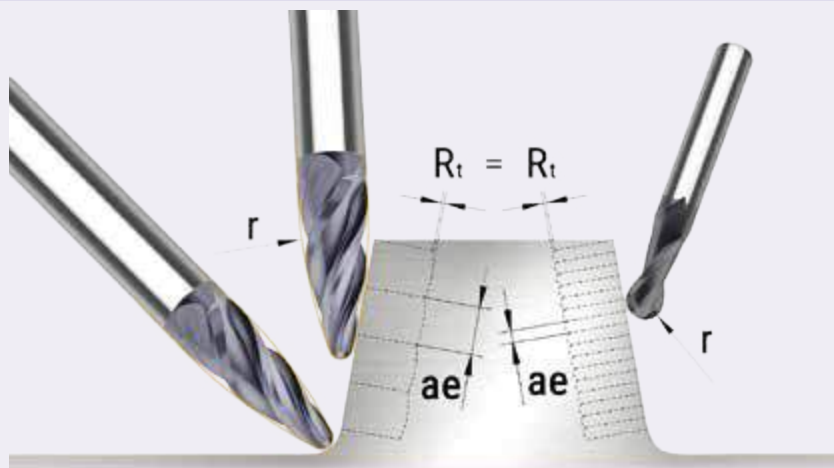
90 m

**3 times the service life**

**ATORN®**

# ATORN® Curve segment milling cutter

INFO



Reduction of workpiece costs and considerably shorter manufacturing times based on the significant increase in the line spacing ae.

$$ae = 2 \times \sqrt{r^2 - (r - R_t)^2} \text{ [mm]}$$

$$R_t = r - \sqrt{r^2 - \left(\frac{ae}{2}\right)^2} \text{ [mm]}$$

$$\rightarrow R_t \times 1000 \text{ [\mu m]}$$

- r = Radius curve segment milling cutter / copy milling cutter
- ae = line spacing
- Rt = theoretical roughness

# ATORN® Circle segment milling cutter

VHM Typ N DIN 6535 HA Z 4 TiAlN 3D PRINT *i* Vc/fz 802

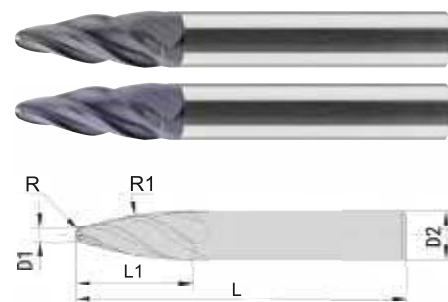
- Reduction of workpiece costs and considerably shorter manufacturing times based on the significant increase in the line spacing ae
- New manufacturing possibilities
  - Undercuts
  - Semi-finishing and finishing of tight contours
  - Variable setting angle possible
  - Machining of tight inner radii
  - Freeform surfaces
- Improved surface finish
- Increased tool life

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc		
		190	180	130	80	100		180				600	550	180	120				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

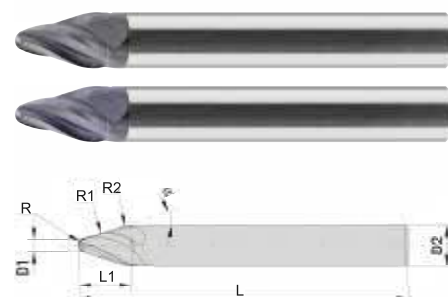
## Tangential

D1	D2	L	L1	R	R1	Feed fz	art.no.	€	TiAlN	€
mm	mm	mm	mm	mm	mm	steel < 1000 N/mm² mm/tooth			art.no.	
2	8	70	24	1	95	0.048	254170 0020	132,50	254171 0020	145,50
4	12	83	28	2	90	0.072	254170 0040	180,50	254171 0040	197,50
6	16	105	30	3	80	0.096	254170 0060	265,-	254171 0060	282,-
							2169		2169	



## Conical

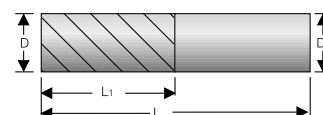
D1	D2	L	L1	α	R	R1	R2	Feed fz	art.no.	€	TiAlN	€
mm	mm	mm	mm	°	mm	mm	mm	steel < 1000 N/mm² mm/tooth			art.no.	
2	8	75	10	18	1	300	1	0.048	254172 1820	134,50	254173 1820	147,50
4	12	100	14	18	2	450	2	0.072	254172 1840	189,-	254173 1840	209,-
6	16	120	18	18	3	1200	3	0.096	254172 1860	293,-	254173 1860	311,-
6	16	120	12	28	3	800	3	0.096	254172 2860	293,-	254173 2860	311,-
8	16	120	16	18	4	1200	4	0.096	254172 1880	293,-	254173 1880	311,-
8	16	120	11	28	4	800	4	0.096	254172 2880	293,-	254173 2880	311,-
							2169		2169			



# SARA® Die-sinking cutter



- Tapered form
- Constructional dimensions in compliance with factory standard
- For use in extruder, die, mould, model and tool making



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Co-alloy	graphite GRP/CFP/thermo	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	<30 HRc	≥30 HRc	<8% Si	≥8% Si			<55 HRc	<60 HRc	≥60 HRc	
		40-60	40-55	40-50	30-45	30-45	20-30	40-60	40-60							30-40			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



Taper angle one-side	D mm	L1 mm	L mm	D1 mm	Z	art.no.	€
1	2.5	20	60	4	3	253002 1001	40,70
1	3.0	20	60	4	3	253002 1002	45,40
1	4.0	20	65	5	3	253002 1003	45,70
1	5.0	30	75	6	3	253002 1004	56,-
1	6.0	30	75	8	3	253002 1005	77,30
1	8.0	30	75	10	4	253002 1006	99,20
1	10.0	30	75	12	4	253002 1007	115,-
1	12.0	55	100	14	4	253002 1008	204,-
1	16.0	55	100	18	4	253002 1009	316,-
1.5	2.5	20	60	4	3	253002 1501	40,70
1.5	3.0	19	60	4	3	253002 1502	40,70
1.5	4.0	19	60	5	3	253002 1503	45,10
1.5	5.0	35	75	8	3	253002 1504	73,80
1.5	6.0	35	75	8	3	253002 1505	75,80
1.5	8.0	35	75	10	4	253002 1506	96,70
1.5	10.0	38	75	12	4	253002 1507	117,-
1.5	12.0	60	100	16	4	253002 1508	234,-
1.5	16.0	65	100	20	4	253002 1509	395,-
2	2.5	20	60	4	3	253002 2001	40,70
2	3.0	25	60	5	3	253002 2002	45,10
2	3.5	20	60	5	3	253002 2003	45,10
2	4.0	20	60	6	3	253002 2004	49,10
2	5.0	35	75	8	3	253002 2006	82,40
2	6.0	28	75	8	3	253002 2008	71,20
2	6.0	57	100	10	3	253002 2009	132,50
2	8.0	28	75	10	4	253002 2010	94,60
2	8.0	57	100	12	4	253002 2011	152,-
2	10.0	28	75	12	4	253002 2012	121,50
2	12.0	28	75	14	4	253002 2013	177,-

2109

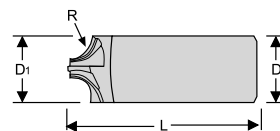
Taper angle one-side	D mm	L1 mm	L mm	D1 mm	Z	art.no.	€
2	12.0	57	100	16	4	253002 2014	250,-
2	16.0	55	100	20	4	253002 2015	420,-
3	2.5	20	60	5	3	253002 3001	41,20
3	3.0	25	60	6	3	253002 3002	51,40
3	3.0	40	75	8	3	253002 3003	77,90
3	4.0	38	75	8	3	253002 3004	84,-
3	5.0	28	75	8	3	253002 3005	85,50
3	6.0	38	75	10	3	253002 3006	109,-
3	6.0	57	100	12	3	253002 3007	147,50
3	8.0	38	75	12	4	253002 3008	126,50
3	8.0	57	100	14	4	253002 3009	193,50
3	10.0	38	75	14	4	253002 3010	165,-
3	12.0	55	100	18	4	253002 3012	341,-
5	2.5	20	60	6	3	253002 5001	45,30
5	3.0	28	75	8	3	253002 5002	81,40
5	3.0	40	75	10	3	253002 5003	112,-
5	3.5	25	75	8	3	253002 5004	81,40
5	4.0	22	75	8	3	253002 5005	81,40
5	5.0	28	75	10	3	253002 5008	110,-
5	6.0	34	75	12	3	253002 5009	122,50
5	6.0	57	100	16	3	253002 5010	229,-
5	8.0	57	100	18	4	253002 5011	331,-
5	10.0	34	75	16	4	253002 5012	214,-
5	10.0	45	100	18	4	253002 5013	346,-
5	12.0	45	100	20	4	253002 5015	395,-
7	2.5	22	75	8	3	253002 7001	77,90
7	5.0	28	75	12	3	253002 7002	125,50
10	2.5	21	75	10	3	253002 1101	106,-
10	3.0	25	75	12	3	253002 1102	131,50

2109



## SARA® Quadrant milling cutter

VHM **Werks-norm** **Typ N** **h10** **h6** **DIN 6535 HA** **Z 4** **Vc/fz 797**



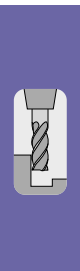
- Factory standard
- **Design:** straight-fluted, no profile distortion
- **Application:** for rounding off and deburring edges

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		70-100	60-90	35-60	35-70	25-60	25-60	70-95	60-80		10-30	10-30	140-500	140-500	85-190		65-90	65-90	40-60

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

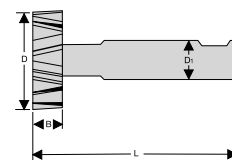
D mm	L mm	R mm	D1 mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
8.0	70	0.5	7	0.004	291310 0050	92,10
8.0	70	1.0	6	0.009	291310 0100	92,50
10.0	75	1.5	7	0.009	291310 0150	98,10
10.0	75	2.0	6	0.015	291310 0200	98,10
12.0	75	2.5	7	0.015	291310 0250	107,-
12.0	75	3.0	6	0.015	291310 0300	107,-
16.0	80	3.5	9	0.015	291310 0350	136,-
16.0	80	4.0	8	0.033	291310 0400	136,-
16.0	80	4.5	7	0.033	291310 0450	136,-
20.0	80	5.0	10	0.033	291310 0500	190,-
20.0	80	6.0	8	0.055	291310 0600	190,-
25.0	100	8.0	9	0.064	291310 0800	313,-
25.0	100	10.0	5	0.073	291310 1000	318,-

2152



## SARA® Slotting cutter

VHM **DIN 850** **Typ N** **h11** **h6** **DIN 1835 B** **Z 6** **Z 8+** **AlCrN** **Vc/fz 774**



- For keyway milling in accordance with DIN 6888
- For slot milling
- Circumferential cutting
- With cross-cut toothing
- in accordance with DIN 850

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		90-120	60-80					100-120	80-100										

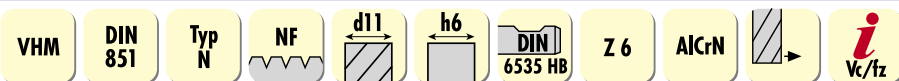
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D h11 mm	B mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
10.5	2	50	6.0	6	0.036	292004 1052	241,-
10.5	3	50	6.0	6	0.036	292004 1053	260,-
13.5	2	56	10.0	8	0.036	292004 1352	324,-
13.5	3	56	10.0	8	0.036	292004 1353	345,-
13.5	4	56	10.0	8	0.036	292004 1354	365,-
16.5	3	56	10.0	10	0.036	292004 1653	375,-
16.5	4	56	10.0	10	0.036	292004 1654	395,-
19.5	3	63	10.0	10	0.039	292004 1953	380,-
19.5	4	63	10.0	10	0.039	292004 1954	405,-
22.5	4	63	10.0	10	0.039	292004 2254	470,-
25.5	5	63	10.0	10	0.039	292004 2555	539,-
28.5	5	63	10.0	10	0.041	292004 2855	609,-
32.5	5	71	12.0	10	0.041	292004 3255	719,-
38.5	10	71	12.0	10	0.041	292004 3851	799,-
45.5	10	71	12.0	10	0.041	292004 4551	849,-

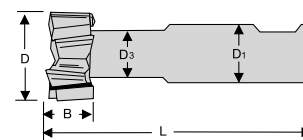
2152



## SARA® T-slot milling cutter



- For milling T-slots in accordance with DIN 650
- Circumferential cutting
- With cross-cut toothing



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●					●	●											
		90-120	60-80					100-120	80-100											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Type N

D h11	B	L	D3	D1	Feed fz	art.no.	€
mm	mm	mm	mm	mm	steel < 1000 N/mm²		
					mm/tooth		
12.5	6	57	5	10	0.033	<b>292005</b> 1256	<b>395,-</b>
16	8	62	7	10	0.034	292005 1680	499,-
18	8	70	8	12	0.034	292005 1880	509,-
21	9	74	10	12	0.034	292005 2190	589,-
25	11	82	12	16	0.034	292005 2511	679,-
28	12	85	13	16	0.35	292005 2812	749,-
32	14	90	15	16	0.045	292005 3214	869,-

2152



### Type NF

D h11	B	L	D3	D1	Feed fz	art.no.	€
mm	mm	mm	mm	mm	steel < 1000 N/mm²		
					mm/tooth		
12.5	6	57	5	10	0.033	<b>292006</b> 1256	<b>435,-</b>
16	8	62	7	10	0.034	292006 1608	549,-
18	8	70	8	12	0.034	292006 1808	559,-
21	9	74	10	12	0.034	292006 2109	639,-
25	11	82	12	16	0.034	292006 2511	739,-
28	12	85	13	16	0.035	292006 2812	819,-
32	14	90	15	16	0.045	292006 3214	959,-

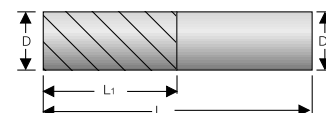
2152



## SARA® Engraving cutter



- 1 cutting edge, centre cutting
- For engraving plastics and non-ferrous metals
- Lettering width 0.1 mm



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		○	○	○	●	●		○					●	●	○					
		40-60	25-45	15-35	20-40	20-40		35-55					120-140	85-105	160-180					

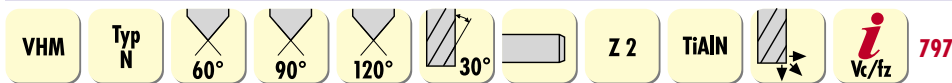
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D	D1	L	L1	Feed fz	art.no.	€
mm	mm	mm	mm	aluminium < 8 % Si		
				mm/tooth		
3.0	3.0	40	15	0.01	<b>251545</b> 0030	<b>40,60</b>
4.0	4.0	40	15	0.02	251545 0040	43,40
6.0	6.0	40	15	0.03	251545 0060	46,70

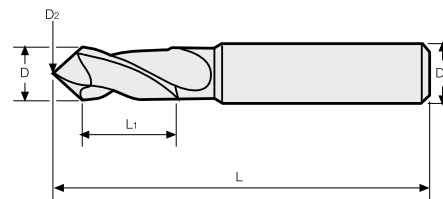
2152



# SARA® MULTI-V multifunction tool

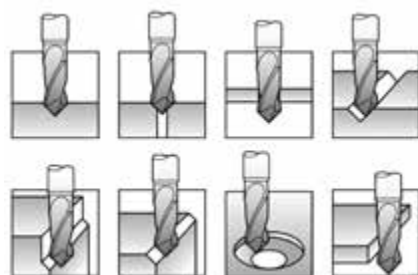


- Reinforced straight shank
- **Cutting material: K15F solid carbide, TiAlN-coated**
- Milling, drilling and countersinking with a single tool
- Especially suitable for use on CNC machining centres
- Up to eight machining operations without tool change



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		40-75	35-40	30-35	30-35	30-35		35-40	30-35	25-30	10-20		100-150	50-120	60-80				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

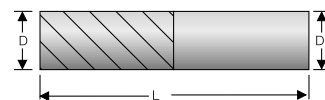


D mm	L mm	L1 mm	D1 mm	D2 mm	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth		60°		90°		120°	
					art.no.	€	art.no.	€	art.no.	€		
0.5	39	1.0	3.0	0.05	0.002	0.004			251556 0050	45,50		
0.6	39	1.2	3.0	0.06	0.002	0.004			251556 0060	45,50		
0.7	39	1.4	3.0	0.07	0.002	0.004			251556 0070	45,50		
0.8	39	1.6	3.0	0.08	0.002	0.004			251556 0080	45,50		
0.9	39	1.8	3.0	0.09	0.002	0.004			251556 0090	45,50		
1.0	39	2.0	3.0	0.10	0.003	0.006	251548 0100	55,50	251556 0100	45,50	251542 0100	45,50
1.2	39	2.4	3.0	0.12	0.003	0.006			251556 0120	45,50		
1.4	39	2.8	3.0	0.14	0.003	0.006			251556 0140	45,50		
1.5	39	3.0	3.0	0.15	0.003	0.006	251548 0150	55,50	251556 0150	45,50	251542 0150	45,50
1.8	39	3.6	3.0	0.18	0.003	0.006			251556 0180	45,50		
2.0	39	4.0	3.0	0.20	0.004	0.008	251548 0200	55,50	251556 0200	45,50	251542 0200	45,50
2.5	39	5.0	3.0	0.25	0.004	0.008	251548 0250	55,50	251556 0250	45,50	251542 0250	45,50
3.0	50	6.0	4.0	0.30	0.004	0.008	251548 0300	69,70	251556 0300	57,-	251542 0300	57,-
4.0	50	8.0	5.0	0.40	0.004	0.008	251548 0400	72,80	251556 0400	59,-	251542 0400	59,-
5.0	50	10.0	6.0	0.50	0.006	0.013	251548 0500	76,80	251556 0500	62,60	251542 0500	62,60
6.0	60	12.0	8.0	0.60	0.006	0.013	251548 0600	94,10	251556 0600	74,80		
8.0	70	16.0	10.0	0.80	0.012	0.025	251548 0800	130,50	251556 0800	106,-	251542 0800	106,-
10.0	70	18.0	12.0	1.00	0.012	0.025	251548 1000	168,-	251556 1000	136,50	251542 1000	136,50
12.0	70	20.0	12.0	1.20	0.017	0.040	251548 1200	168,-	251556 1200	136,50	251542 1200	136,50
16.0	80	26.0	16.0	1.60	0.020	0.050	251548 1600	237,-	251556 1600	193,50	251542 1600	193,50
20.0	100	32.0	20.0	2.00	0.027	0.062	251548 2000	410,-	251556 2000	333,-	251542 2000	333,-
							2108		2108		2108	

## ATORN® Deburring tool



• Ideal for chamfering and deburring workpiece edges, and for contour milling



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 160-180	● 120-140	● 100-120	● 80-100	○ 60-80	○ 60-80	● 140-160	● 140-160	○ 80-100	○ 80-100	○ 60-80							

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L mm	D1 mm	Z	60°		90°		120°	
				art.no.	€	art.no.	€	art.no.	€
1.0	38	3	3	251550 0010	27,40	251551 0010	27,40	251552 0010	27,40
2.0	38	3	3	251550 0020	27,40	251551 0020	27,40	251552 0020	27,40
3.0	38	3	3	251550 0030	27,40	251551 0030	27,40	251552 0030	27,40
4.0	51	4	4	251550 0040	29,10	251551 0040	29,10	251552 0040	29,10
6.0	64	6	4	251550 0060	36,-	251551 0060	36,-	251552 0060	36,-
8.0	64	8	5	251550 0080	44,80	251551 0080	44,80	251552 0080	44,80
10.0	70	10	6	251550 0100	52,90	251551 0100	52,90	251552 0100	52,90
12.0	78	12	6	251550 0120	77,90	251551 0120	77,90	251552 0120	77,90
16.0	89	16	6	251550 0160	132,50	251551 0160	132,50	251552 0160	132,50
				2108		2108		2108	

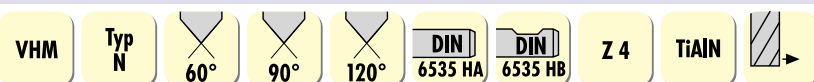


### 90° deburring tool set

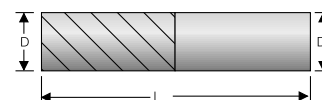
Contents		art.no.	€
Ø 6, 8, 10, 12 mm (1 of each)		251551 0001	204,-
2108			



## SARA® Deburring tool



• 4 cutting edges  
 • Ideal for chamfering and deburring workpiece edges, and for contour milling  
 • Cutting material: superfine grain solid carbide, TiAlN-coated



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 160-180	● 120-140	● 100-120	● 80-100	○ 60-80	○ 60-80	● 140-160	● 140-160	○ 80-100	○ 80-100	○ 60-80							

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

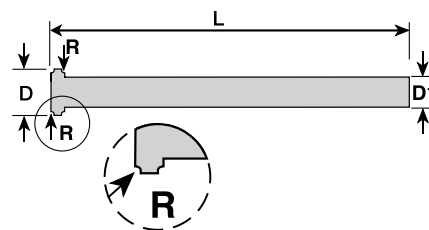
D mm	L mm	D1 mm	60° HA		90° HA		90° HB		120° HA	
			art.no.	€	art.no.	€	art.no.	€	art.no.	€
4	51	4	251538 0040	24,30	251540 0040	24,30			255165 0040	24,30
6	64	6	251538 0060	29,80	251540 0060	29,80	251543 0060	30,70	255165 0060	29,80
8	64	8	251538 0080	37,10	251540 0080	37,10	251543 0080	38,20	255165 0080	37,10
10	70	10	251538 0100	43,80	251540 0100	43,80	251543 0100	45,-	255165 0100	43,80
12	78	12	251538 0120	65,10	251540 0120	65,10	251543 0120	66,70	255165 0120	65,10
			2112		2112		2112		2112	



## SARA® Front and rear-side quadrant milling cutter



• For linear and circular front and rear-side radius milling



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		40-65	40-50	25-35	30-40	15-20	15-20	25-35	25-35				150-230	80-115	40-60		20-25	15-20	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	D1 mm	L mm	R mm	art.no.	€
8.0	6	100	0.2	291320 0002	139,50
8.0	6	100	0.3	291320 0003	139,50
8.0	6	100	0.4	291320 0004	139,50
8.0	6	100	0.5	291320 0005	139,50
10.0	6	100	0.8	291320 0008	146,-
10.0	6	100	1.0	291320 0010	146,-
10.0	6	100	1.2	291320 0012	146,-
10.0	6	100	1.5	291320 0015	146,-

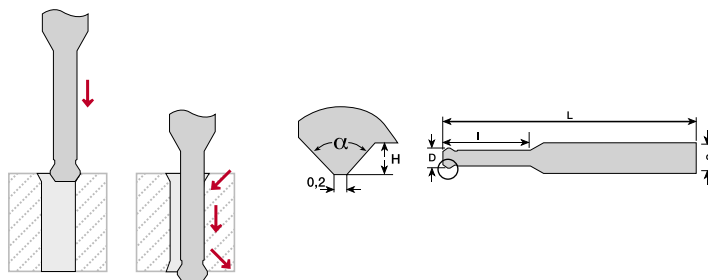
2162

## ATORN® Front and rear-side deburring tool



• For linear and circular front and rear-side deburring or chamfering

- Two cutting edges
- Spiral-fluted for an easy cut



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc
		60-120	60-90	50-80	70-100	60-90	60-90	40-80	40-80	20-40	20-40	20-30	100-200	60-140	60-100		50-60		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

90°

D mm	d mm	L mm	l mm	H mm	α °	art.no.	€
1.5	3	39	3.8	0.3	90	250005 0015	52,90
2.0	3	39	5.0	0.4	90	250005 0020	52,90
2.5	3	39	6.3	0.5	90	250005 0025	52,90
3.0	3	39	7.5	0.6	90	250005 0030	52,90
3.5	4	51	8.8	0.7	90	250005 0035	56,-
4.0	4	51	10.0	0.8	90	250005 0040	56,-
4.5	5	51	11.3	1.0	90	250005 0045	57,50
5.0	5	51	12.5	1.1	90	250005 0050	57,50
5.5	6	51	13.8	1.2	90	250005 0055	60,60
6.0	6	51	15.0	1.5	90	250005 0060	60,60



2108

Continued on next page >>>

90° for large projecting lengths

D mm	d mm	L mm	l mm	H mm	α °	art.no.	€
3.0	3	39	12.0	0.6	90	<b>250006 0030</b>	<b>52,90</b>
3.5	4	51	14.0	0.7	90	250006 0035	56,-
4.0	4	51	16.0	0.8	90	250006 0040	56,-
4.5	5	51	18.0	1.0	90	250006 0045	57,50
5.0	5	51	20.0	1.1	90	250006 0050	57,50
5.5	6	58	22.0	1.2	90	250006 0055	60,60
6.0	6	58	24.0	1.5	90	250006 0060	60,60
8.0	8	64	28.0	1.6	90	250006 0080	78,90
10.0	10	73	35.0	1.8	90	250006 0100	103,-
12.0	12	84	42.0	2.1	90	250006 0120	126,-

2108

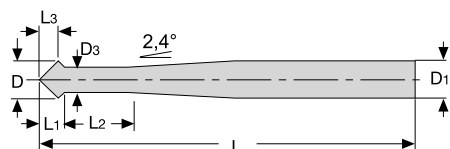
**ATORN®** Front and rear-side deburring tool



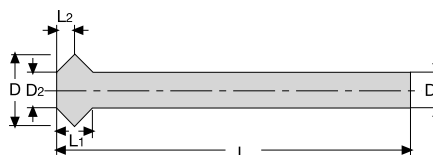
- For linear and circular front and rear-side deburring or chamfering



250004 0040  
250004 0060



250004 0080  
250004 0100  
250004 0120



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		60-120	60-90	50-80	70-100	60-90	60-90	40-80	40-80	20-40	20-40	20-30	100-200	60-140	60-100		50-60		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	D1 h6 mm	D2 mm	L mm	L1 mm	L3 mm	L2 mm	D3 mm	art.no.	€
3.9	4	-	75	2.95	1.95	10	1.9	<b>250004 0040</b>	<b>76,30</b>
5.8	6	-	100	3.8	1.9	15	4	250004 0060	84,90
7.8	6	6.0	100	1.8	-	0.9	-	250004 0080	110,50
9.8	6	6.0	100	3.8	-	1.9	-	250004 0100	135,50
11.8	6	6.0	100	5.8	-	2.9	-	250004 0120	163,50

2169

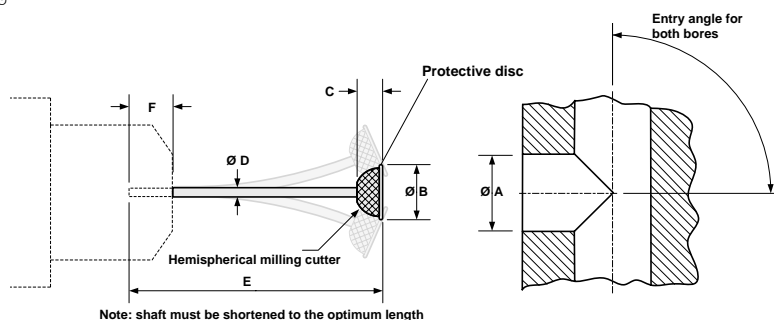
# Orbitool deburring tool® for machining on the inside



- **Deburring tool system for intersecting bores**
- Can be used reliably in automated applications with CNC machines
- Fully integrated into the production process **from 2.0 mm bore diameter**
- Free of burrs with no manual finishing
- With the ORBITOOL® deburring tool, the deburring process is easy to control. Material abrasion only occurs on the edges of the workpiece. The (bore) surfaces are not touched thanks to the protective disc. Intact surfaces are not scratched and workpieces are not damaged. This makes work considerably easier, especially with precision parts. Once the protective disc has passed the edges, the cutting surfaces of the deburring tool can cut away material from the edges. Deburring is carried out as the milling cutter moves in a spiral through the axial bore to the centre of the radial bore. In the case of manual deburring with an electric grinding machine, the burrs are removed by forward and backward movements.

### Advantages:

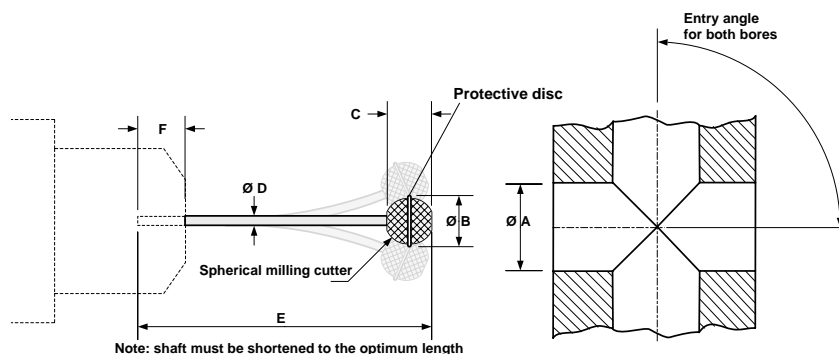
- Consistent results - consistent quality
- Increased throughput capacity/shorter cycle times
- Reduced deburring costs
- No additional deburring work required
- No backlogs in the machining process
- Ideal for CNC machining



### Hemisphere

Dimensions	Approach angle 90°/ A min. mm	Approach angle 60°/ A min. mm	Approach angle 45°/ A min. mm	B mm	C mm	D mm	E mm	f min. mm	f max. mm	art.no.	€
1.90	2.0	a.A.	a.A.	-	2.1	0.78	60	3.8	9.2	<b>250010</b> 0001	234,-
2.38	3.2	4.5	6.2	2.7	2.1	0.78	60	3.8	9.2	250010 0002	199,50
3.18	4.4	6.0	8.2	3.6	2.4	1.14	100	3.8	9.2	250010 0003	199,50
3.97	5.5	7.5	10.2	4.4	2.8	1.55	100	3.8	14.2	250010 0004	224,-
4.77	6.6	9.0	12.3	5.2	3.2	1.55	100	3.8	14.2	250010 0005	224,-
6.35	8.8	12.0	16.4	6.9	3.9	2.39	150	3.8	14.2	250010 0006	224,-
9.58	13.2	18.0	22.5	10.3	5.5	2.39	150	3.8	18.3	250010 0007	255,-

2147



### Ball

Dimensions	Approach angle 90°/ A min. mm	Approach angle 60°/ A min. mm	Approach angle 45°/ A min. mm	B mm	C mm	D mm	E mm	f min. mm	f max. mm	art.no.	€
1.9	2.0	a.A.	a.A.	-	3.2	0.78	60	3.8	9.2	<b>250011</b> 0001	331,-
2.38	3.2	4.5	6.2	2.7	3.2	0.78	60	3.8	9.2	250011 0002	295,-
3.18	4.4	6.0	8.2	3.6	3.9	1.14	100	3.8	9.2	250011 0003	295,-
3.97	5.5	7.5	10.2	4.4	4.6	1.55	100	3.8	14.2	250011 0004	346,-
4.77	6.6	9.0	12.3	5.2	5.4	1.55	100	3.8	14.2	250011 0005	346,-
6.35	8.8	12.0	16.4	6.9	6.8	2.39	150	3.8	14.2	250011 0006	346,-
9.58	13.2	18.0	22.5	10.3	10.1	2.39	150	3.8	18.3	250011 0007	420,-

2147



## Thread milling / circular cutting

INFO

Thread milling cutters are specially designed for use on CNC milling machines and machining centres which have 3-axis control with helical interpolation.

### Advantages and application

- Male and female threads
- For through-hole and blind bore threads
- Synchronous and up-cut milling and change of the axial feed direction
- Enables production of straight and conical threads and of all standard thread variants
- Thread production with varying tolerances
- Optimal clamping
- Short chips
- Low cutting pressure

### HM quality AMT7

TiAlN-coated ultra-fine grain quality for universal applications with all materials at medium to high cutting speeds



### Overview of solid carbide thread milling cutters

Brand	ATORN	ATORN SARA	ATORN SARA	ATORN SARA	ATORN SARA	ATORN	OSG
ISO	N	P M K S N	P M K S N	P M K S N	S H	P M K N	P M K N H
Thread	M MF UN	M MF	G55 BSF BSP	M	M	M	M G55
Thread depth	2 x D	2.2 x D	1.5 x D	2 x D	2 x D	2 x D	2.2 x D
Size range	3 - 16	4 - 27	1/8" - 1"	1 - 20	2 - 16	6 - 23	6 - 24
Coating	-	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	-
Application	ALU				Hard machining	DMT	
Item number	258050 bis 256053	258002.... 258027....	258003....	258010.... 258025....	258011....	258100....	249300.... 249301....
Page	609	610	611	612	612	613	615

### Modular thread/circular milling cutters

Brand	ATORN	ATORN	ATORN
ISO	P M K N	P M K S N H	P M K N
Number of cutting edges	1 - 2	3 - 6	1 - 6
Coolant bore	IC	IC	IC
ISO milling insert type	ISO UN BSW NPT	ISO BSE	ISO UN BSW, BSF NPT TR
Item number	25900. ....	26300. ....	26600. ....
Page	617	621	624

## ATORN® Thread milling cutter for high-speed machining

VHM



Z 3

Z 4

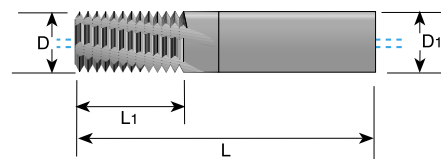
Z 5



809

- Low adhesion to the cutting edges
- **Thread length 2 x D**
- Optimised carbide metal types for aluminium, cast iron and stainless steels
- With internal cooling
- Extremely smooth cutting edge
- For thread with highest surface quality

**Especially for aluminium**

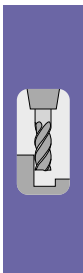


### ISO with internal coolant supply

- \* Without internal cooling

Designation	Pitch mm	Standard thread	Fine thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz		art.no.	€
									aluminium < 8 % Si	mm/tooth		
AMT03024C6 0.5 ISO *	0.5	M3	M4	2.4	3	6.8	39	3	0.04		<b>258050 0010</b>	<b>191,50</b>
AMT06043C10 0.5 ISO	0.5		M5	4.3	6	10.8	58	3	0.04		258050 0020	191,50
AMT06031C8 0.7 ISO	0.7	M4		3.1	6	8.8	58	3	0.04		258050 0030	191,50
AMT0605C13 0.75 ISO	0.75		M6	5.0	6	13.1	58	3	0.06		258050 0040	191,50
AMT0604C10 0.8 ISO	0.8	M5		4.0	6	10.8	58	3	0.06		258050 0050	191,50
AMT06048C13 1.0 ISO	1.0	M6		4.8	6	13.5	58	3	0.06		258050 0060	191,50
AMT0808D21 1.0 ISO	1.0		M10	8.0	8	21.5	64	4	0.06		258050 0070	245,-
AMT08064C16 1.25 ISO	1.25	M8	M10	6.4	8	16.9	64	3	0.06		258050 0080	245,-
AMT0808C21 1.5 ISO	1.5	M10		8.0	8	21.8	64	3	0.06		258050 0090	245,-
AMT12112D29 1.5 ISO	1.5		M14	11.2	12	29.3	84	4	0.13		258050 0100	355,-
AMT10095D25 1.75 ISO	1.75	M12		9.5	10	25.4	73	4	0.13		258050 0110	290,-
AMT14126D35 2.0 ISO	2.0	M16	M17	12.6	14	35	83	4	0.13		258050 0120	460,-

2115



### UN with internal coolant supply

Designation	Pitch TPI	D mm	D1 mm	L1 mm	L mm	Z	Feed fz		art.no.	€
							aluminium < 8 % Si	mm/tooth		
AMT06032C9 32UN	32	3.2	6	9.1	58	3	0.04		<b>258052 0010</b>	<b>191,50</b>
AMT06052C14 28UN	28	5.2	6	14.0	58	3	0.06		258052 0020	191,50
AMT0808D20 24UN	24	8.0	8	20.6	64	4	0.06		258052 0030	245,-
AMT06048C14 20UN	20	4.8	6	14.6	58	3	0.06		258052 0040	191,50
AMT10092C23 20UN	20	9.2	10	23.5	73	3	0.13		258052 0050	290,-
AMT0606C17 18UN	18	6.0	6	17.6	58	3	0.06		258052 0060	191,50
AMT1212D30 18UN	18	12.0	12	30.3	84	4	0.13		258052 0070	355,-
AMT08074C21 16UN	16	7.4	8	21.4	64	3	0.06		258052 0080	245,-
AMT1616E38 16UN	16	16.0	16	38.9	105	5	0.13		258052 0090	509,-

2115



**Over 200,000 tools available online!**

**Register online now!**

**www.saratools.com**



## ATORN® Thread end milling cutter

VHM



Z 3

Z 4

Z 5

Z 6



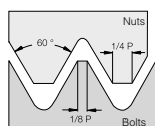
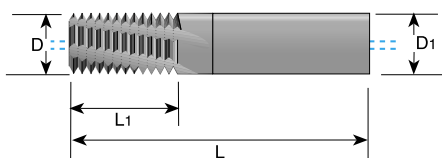
808

- The thread is machined in just one operation
- Chip flutes permit an easy cut
- Short machine times thanks to multiple (3-6) cutting edges
- Operating range from dimension D = 2.2 mm
- Allows thread cutting in blind bores up to the shoulder
- One tool for right-hand and left-hand threads
- One tool for material groups P, M, K, S and H
- Excellent surface finish quality
- Long service life due to special multi-layer coating
- Low cutting pressure makes it possible to machine thin-walled workpieces
- **Cutting material: AMT7 solid carbide, multi-layer TiAlN coating for universal applications**
- **Through-hole version (internal cooling outlet in flute) available on request!**



**Solid carbide thread end milling cutter for the following thread types available on request:**

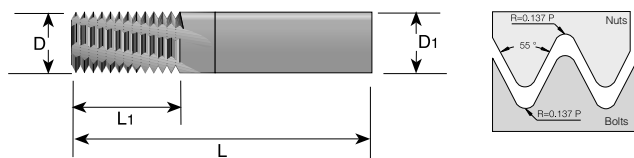
- UN
- BSPT
- NPT
- NPS
- NPTF
- NPSF
- external threads, metr. full profile
- external threads, UN



**Metric, full profile, ISO 60°, internal, with internal coolant supply**

Designation	Pitch mm	Standard thread	Fine thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
MTB06038C10 0.5 ISO	0.5	-	$\emptyset \geq 5$	3.8	6	10.3	58	3	0.03	<b>258002 0002</b>	198,-
MTB06031C7 0.7 ISO	0.7	M 4	$\emptyset \geq 5$	3.1	6	7.4	58	3	0.03	258002 0003	198,-
MTB06045C10 0.75 ISO	0.75	-	$\emptyset \geq 6$	4.5	6	10.1	58	3	0.03	258002 0004	198,-
MTB06038C9 0.8 ISO	0.8	M 5	$\emptyset \geq 6$	3.8	6	9.2	58	3	0.03	258002 0005	198,-
MTB06046C10 1.0 ISO	1.0	M 6	$\emptyset \geq 7$	4.6	6	10.5	58	3	0.03	258002 0010	198,-
MTB06046C14 1.0 ISO	1.0	M 6	$\emptyset \geq 7$	4.6	6	14.5	58	3	0.03	258002 0015	238,-
MTB0606C12 1.0 ISO	1.0	-	$\emptyset \geq 9$	6.0	6	12.5	58	3	0.03	258002 0020	198,-
MTB0808D16 1.0 ISO	1.0	-	$\emptyset \geq 10$	8.0	8	16.5	64	4	0.04	258002 0030	253,-
MTB0606C14 1.25 ISO	1.25	M 8	$\emptyset \geq 10$	6.0	6	14.4	58	3	0.03	258002 0040	198,-
MTB0606C19 1.25 ISO	1.25	M 8	$\emptyset \geq 10$	6.0	6	19.4	58	3	0.03	258002 0045	238,-
MTB08078C17 1.5 ISO	1.5	M10	$\emptyset \geq 12$	7.8	8	17.0	64	3	0.04	258002 0050	253,-
MTB08078C24 1.5 ISO	1.5	M10	$\emptyset \geq 12$	7.8	8	24.8	76	3	0.04	258002 0055	306,-
MTB1010D21 1.5 ISO	1.5	-	$\emptyset \geq 14$	10.0	10	21.8	73	4	0.05	258002 0060	305,-
MTB1212D26 1.5 ISO	1.5	-	$\emptyset \geq 16$	12.0	12	26.3	84	4	0.05	258002 0065	370,-
MTB1616F33 1.5 ISO	1.5	-	$\emptyset \geq 20$	16.0	16	33.8	105	6	0.07	258002 0070	529,-
MTB1009C20 1.75 ISO	1.75	M12	$\emptyset \geq 12$	9.0	10	20.1	73	3	0.05	258002 0080	306,-
MTB1009C28 1.75 ISO	1.75	M12	$\emptyset \geq 12$	9.0	10	28.9	73	3	0.05	258002 0085	365,-
MTB1010C27 2.0 ISO	2.0	M14	$\emptyset \geq 15$	10.0	10	27.0	73	3	0.05	258002 0090	306,-
MTB12118D27 2.0 ISO	2.0	M16	$\emptyset \geq 17$	11.8	12	27.0	84	4	0.05	258002 0100	370,-
MTB12118D39 2.0 ISO	2.0	M16	$\emptyset \geq 17$	11.8	12	39.0	105	4	0.05	258002 0105	440,-
MTB2020F41 2.0 ISO	2.0	-	$\emptyset \geq 26$	20.0	20	41.0	105	6	0.08	258002 0110	649,-
MTB1615E33 2.5 ISO	2.5	M20	$\emptyset \geq 22$	15.0	16	33.8	105	5	0.07	258002 0120	529,-
MTB1615E48 2.5 ISO	2.5	M20	$\emptyset \geq 22$	15.0	16	48.8	105	5	0.07	258002 0125	629,-
MTB2018D40 3.0 ISO	3.0	M24	$\emptyset \geq 25$	18.0	20	40.5	105	4	0.08	258002 0130	649,-
MTB2018D58 3.0 ISO	3.0	M24	$\emptyset \geq 25$	18.0	20	58.5	120	4	0.08	258002 0135	789,-
MTB2020D43 3.0 ISO	3.0	M27	$\emptyset \geq 27$	20.0	20	43.5	105	4	0.08	258002 0140	649,-

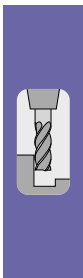
2115



**Ww 55° internal = external**

Designation	Pitch TPI	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
MT0606C9 28W	28	6.0	6	9.5	58	3	0.03	<b>258003 0010</b>	<b>199,50</b>
MT0808C14 19W	19	8.0	8	14.0	64	3	0.04	258003 0020	258,-
MT1212D19 14W	14	12.0	12	19.0	84	4	0.05	258003 0030	370,-
MT1212D26 14W	14	12.0	12	26.3	84	4	0.05	258003 0035	445,-
MT1212C24 11W	11	12.0	12	24.2	84	3	0.05	258003 0040	370,-
MT1616D38 11W	11	16.0	16	38.1	105	4	0.07	258003 0050	539,-
MT2020E47 11W	11	20.0	20	47.3	105	5	0.08	258003 0060	669,-

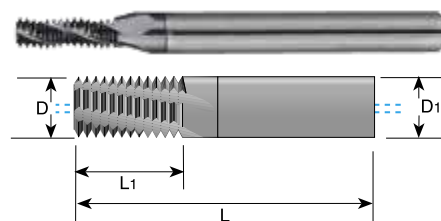
2115



**SARA® Thread end milling cutter**



- the thread is machined in only one process step
- chip flutes permit soft cutting
- short machining times due to multiple (3-6) cutting edges
- operating range from dimension D = 2.2mm
- thread cutting in blind holes possible up to the shoulder
- one tool for right-handed and left-handed threads
- one tool for the material groups P, M, K, S, H
- excellent surface quality
- long service life thanks to special multi-layer coating
- low cutting pressure permits the machining of thin-walled workpieces



**Metric, ISO full profile, internal**

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
VHTM 3 M040 064 06 40	0.70	M4	3.10	6	9.0	64	3	0.03	<b>258027 0010</b>	<b>105,-</b>
VHTM 3 M050 064 06 40	0.80	M5	4.00	6	11.0	64	3	0.03	258027 0015	105,-
VHTM 3 M060 064 06 40	1.00	M6	4.50	6	13.5	64	3	0.03	258027 0020	105,-
VHTM 3 M080 064 06 40	1.25	M8	6.00	6	18.0	64	3	0.03	258027 0025	105,-
VHTM 3 M100 064 08 40	1.50	M10	7.50	8	22.0	64	3	0.04	258027 0030	143,50
VHTM 4 M120 070 10 40	1.75	M12	9.50	10	26.0	70	4	0.05	258027 0035	185,50
VHTM 4 M140 070 10 40	2.00	M14	10.0	10	30.0	70	4	0.05	258027 0040	185,50
VHTM 4 M160 083 12 40	2.00	M16	12.00	12	34.0	83	4	0.05	258027 0045	229,-
VHTM 4 M200 100 16 40	2.50	M20	16.00	16	42.0	100	4	0.07	258027 0050	290,-

2166

**Metric, full profile ISO, internal, with internal coolant supply**

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
VHTMI 3 M040 064 06 40	0.70	M4	3.10	6	9.0	64	3	0.03	<b>258028 0010</b>	<b>121,-</b>
VHTMI 3 M050 064 06 40	0.80	M5	4.00	6	11.0	64	3	0.03	258028 0015	121,-
VHTMI 3 M060 064 06 40	1.00	M6	4.50	6	13.5	64	3	0.03	258028 0020	121,-
VHTMI 3 M080 064 06 40	1.25	M8	6.00	6	18.0	64	3	0.03	258028 0025	121,-
VHTMI 3 M100 064 08 40	1.50	M10	7.50	8	22.0	64	4	0.04	258028 0030	160,-
VHTMI 4 M120 070 10 40	1.75	M12	9.50	10	26.0	70	4	0.05	258028 0035	207,-
VHTMI 4 M140 070 10 40	2.00	M14	10.0	10	30.0	70	4	0.05	258028 0040	207,-
VHTMI 4 M160 083 12 40	2.00	M16	12.00	12	34.0	83	4	0.05	258028 0045	250,-
VHTMI 4 M200 100 16 40	2.50	M20	16.00	16	42.0	100	4	0.07	258028 0050	312,-

2166

## ATORN® Thread end milling cutter for small bores

VHM



Z 3

Z 4

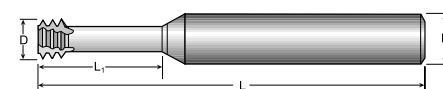
Z 5

HSC



808

- Especially for small bores, with straight shank
- Thread cutting from M1 x 0.25 mm, thread depth up to 2 x D1
- Version for thread depths up to 3 x D1 available on request
- Suitable for HSC, extremely low cutting pressure, excellent surface finish quality
- Allows thread cutting in blind bores up to the shoulder
- Long service life due to special multi-layer coating
- One tool for right-hand and left-hand threads
- Cutting material: AMT7 solid carbide, multi-layer TiAlN coating for universal applications
- MTSH version for hard machining up to 62 HRC available on request!



### Metric, full profile, ISO 60°, internal

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
MTS03007C2 0.25 ISO	0.25	M1	0.72	3	2.5	39	3	0.04	<b>258010</b> 0010	133,50
MTS06016C4 0.4 ISO	0.4	M2	1.53	6	4.5	58	3	0.04	258010 0020	133,50
MTS06017C5 0.45 ISO	0.45	M2.2	1.65	6	5.0	58	3	0.04	258010 0022	133,50
MTS0602C5 0.45 ISO	0.45	M2.5	1.95	6	5.5	58	3	0.04	258010 0025	133,50
MTS06024C6 0.5 ISO	0.5	M3	2.37	6	6.5	58	3	0.04	258010 0030	133,50
MTS06028C7 0.6 ISO	0.6	M3.5	2.75	6	7.5	58	3	0.05	258010 0035	133,50
MTS06031C9 0.7 ISO	0.7	M4	3.10	6	9.0	58	3	0.05	258010 0040	133,50
MTS06038C12 0.8 ISO	0.8	M5	3.80	6	12.5	58	3	0.05	258010 0050	133,50
MTS06047C14 1.0 ISO	1.0	M6	4.65	6	14.0	58	3	0.06	258010 0060	133,50
MTS0606C18 1.25 ISO	1.25	M8	6.00	6	18.0	58	3	0.07	258010 0080	133,50
MTS08078C23 1.5 ISO	1.5	M10	7.80	8	23.0	64	3	0.07	258010 0100	178,-
MTS01009C26 1.75 ISO	1.75	M12	9.00	10	26.0	73	3	0.07	258010 0120	206,-
MTS12118D35 2.0 ISO	2.0	M16	11.80	12	35.0	84	4	0.07	258010 0160	290,-
MTS1615E43 2.5 ISO	2.5	M20	15.00	16	43.0	105	5	0.07	258010 0200	375,-

2115

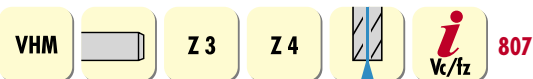
**Code M04, anti-clockwise**

### Metric, full profile, ISO 60°, internal, for hard machining up to 62 HRC, anticlockwise rotation (code M04)

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
MTSH06016C4 0.4 ISO	0.4	M2	1.53	6	4.5	58	3	0.02	<b>258011</b> 0020	144,-
MTSH06017C5 0.45 ISO	0.45	M2.2	1.65	6	5.0	58	3	0.02	258011 0022	144,-
MTSH0602C5 0.45 ISO	0.45	M2.5	1.95	6	5.5	58	3	0.02	258011 0025	144,-
MTSH06024C6 0.5 ISO	0.5	M3	2.37	6	6.5	58	3	0.02	258011 0030	144,-
MTSH06028C7 0.6 ISO	0.6	M3.5	2.75	6	7.5	58	3	0.03	258011 0035	144,-
MTSH06031C9 0.7 ISO	0.7	M4	3.10	6	9.0	58	3	0.03	258011 0040	144,-
MTSH06038C12 0.8 ISO	0.8	M5	3.80	6	12.5	58	3	0.03	258011 0050	144,-
MTSH06047C14 1.0 ISO	1.0	M6	4.65	6	14.0	58	3	0.04	258011 0060	144,-
MTSH0606C18 1.25 ISO	1.25	M8	6.00	6	18.0	58	3	0.04	258011 0080	144,-
MTSH08078C23 1.5 ISO	1.5	M10	7.80	8	23.0	64	3	0.05	258011 0100	188,50
MTSH1009C26 1.75 ISO	1.75	M12	9.00	10	26.0	73	3	0.06	258011 0120	254,-
MTSH12118D35 2.0 ISO	2.0	M16	11.80	12	35.0	84	4	0.07	258011 0160	305,-

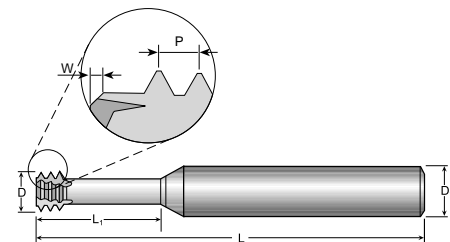
2115

## ATORN® DMT drilling and thread milling cutter



- **High-performance tool with IC for manufacturing female threads**
- Using a circular motion, you cut the tapping hole, mill the thread and countersink in a single operation
- Eliminates the need to pre-drill the tapping hole
- Fast turnaround reduces your machine times
- Suitable for through-holes and blind bores
- **No time wasted on tool changes as only one tool is used for drilling, thread milling and chamfering**
- Full profile tool
- **Anticlockwise spindle rotation, code M04:**  
**Left-hand thread = reverse rotation**  
**Right-hand thread = synchronous rotation**
- Can be used with a large variety of materials
- **Thread depth 2 x D**
- **Cutting material: AMT7 solid carbide, multi-layer TiAlN coating for universal applications**

**Drilling  
Thread milling  
Chamfering**



### Metric, full profile, ISO 60°, internal

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	W mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
DMT08047C14 1.0 ISO	1.0	M 6 - M 9	4.7	8	14	64	0.4	3	0.02	<b>258100 0060</b>	<b>222,-</b>
DMT08061D18 1.25 ISO	1.25	M 8 - M 12	6.1	8	18	64	0.5	4	0.02	258100 0080	222,-
DMT08078D23 1.5 ISO	1.5	M 10 - M 15	7.8	8	23	64	0.6	4	0.02	258100 0100	222,-
DMT1009D26 1.75 ISO	1.75	M 12	9.0	10	26	73	0.6	4	0.03	258100 0120	302,-
DMT12118D35 2.0 ISO	2.0	M 16 - M 23	11.8	12	35	84	0.6	4	0.04	258100 0160	365,-

2115

## SARA® Thread end milling cutter

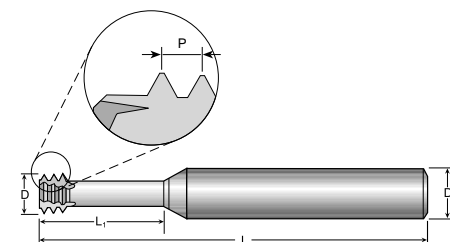


- Thread cutting from M1.6 x 0.35mm to M36 x 4
- **Thread depth 3 to 5 x D**
- HSC-suitable, extremely low cutting pressure, excellent surface quality
- Thread cutting in blind holes possible up to the shoulder
- long service life thanks to special multi-layer coating
- one tool for right-handed and left-handed threads



### Metric, full profile, ISO 60°, internal

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
VHTMM 3 M016 064 06 40	0.35	M1.6	1.20	6	4.8	64	3	0.04	<b>258025 0010</b>	<b>75,80</b>
VHTMM 3 M016 064 06 40 L080	0.35	M1.6	1.20	6	8.0	64	3	0.04	258025 0015	79,90
VHTMM 3 M018 064 06 40	0.35	M1.8	1.40	6	5.4	64	3	0.04	258025 0020	75,80
VHTMM 3 M018 064 06 40 L090	0.35	M1.8	1.40	6	9.0	64	3	0.04	258025 0025	79,90
VHTMM 3 M020 064 06 40	0.40	M2.0	1.50	6	6.0	64	3	0.04	258025 0030	75,80
VHTMM 3 M020 064 06 40 L100	0.40	M2.0	1.50	6	10.0	64	3	0.04	258025 0035	79,90
VHTMM 3 M025 064 06 40	0.45	M2.5	1.90	6	7.5	64	3	0.04	258025 0040	75,80
VHTMM 3 M025 064 06 40 L125	0.45	M2.5	1.90	6	12.5	64	3	0.04	258025 0045	79,90
VHTMM 3 M030 064 06 40	0.50	M3	2.40	6	9.5	64	3	0.04	258025 0050	75,80
VHTMM 3 M030 064 06 40 L150	0.50	M3	2.40	6	15.0	64	3	0.04	258025 0055	79,90
VHTMM 3 M040 064 06 40	0.70	M4	3.10	6	12.5	64	3	0.05	258025 0060	75,80
VHTMM 3 M040 064 06 40 L200	0.70	M4	3.10	6	20.0	64	3	0.05	258025 0065	79,90
VHTMM 3 M050 064 06 40	0.80	M5	4.00	6	16.0	64	3	0.05	258025 0070	75,80
VHTMM 3 M050 064 06 40 L250	0.80	M5	4.00	6	25.00	64	3	0.05	258025 0075	79,90



2166

Continued on next page >>>

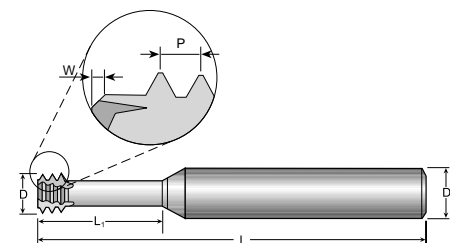
Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
VHTMM 3 M060 064 06 40	1.00	M6	4.50	6	20.0	64	3	0.06	258025 0080	75,80
VHTMM 3 M060 070 06 40 L300	1.00	M6	4.50	6	30.0	70	3	0.06	258025 0085	82,40
VHTMM 4 M080 064 06 40	1.25	M8	6.00	6	24.0	64	4	0.07	258025 0090	75,80
VHTMM 4 M080 078 06 40 L400	1.25	M8	6.00	6	40.0	78	4	0.07	258025 0095	84,50
VHTMM 4 M100 078 08 40	1.50	M10	7.50	8	33.0	78	4	0.07	258025 0100	105,50
VHTMM 4 M100 089 08 40 L500	1.50	M10	7.50	8	50.0	89	4	0.07	258025 0105	111,-
VHTMM 4 M120 089 10 40	1.75	M12	9.50	10	38.0	89	4	0.07	258025 0110	126,50
VHTMM 4 M120 110 10 40 L600	1.75	M12	9.50	10	60.0	110	4	0.07	258025 0115	137,50
VHTMM 4 M160 100 12 40	2.00	M16	12.00	12	50.0	100	4	0.07	258025 0120	212,-
VHTMM 4 M160 130 12 40 L800	2.00	M16	12.00	12	80.0	130	4	0.07	258025 0125	244,-
VHTMM 4 M200 102 16 40	2.50	M20	14.95	16	50.0	102	4	0.07	258025 0130	318,-
VHTMM 4 M240 102 18 40	3.00	M24	17.95	18	50.0	102	4	0.07	258025 0135	365,-
VHTMM 4 M300 120 20 40	3.50	M30	19.95	20	60.0	120	4	0.07	258025 0140	425,-
VHTMM 4 M360 120 20 40	4.00	M36	19.95	20	60.0	120	4	0.07	258025 0145	445,-

2166

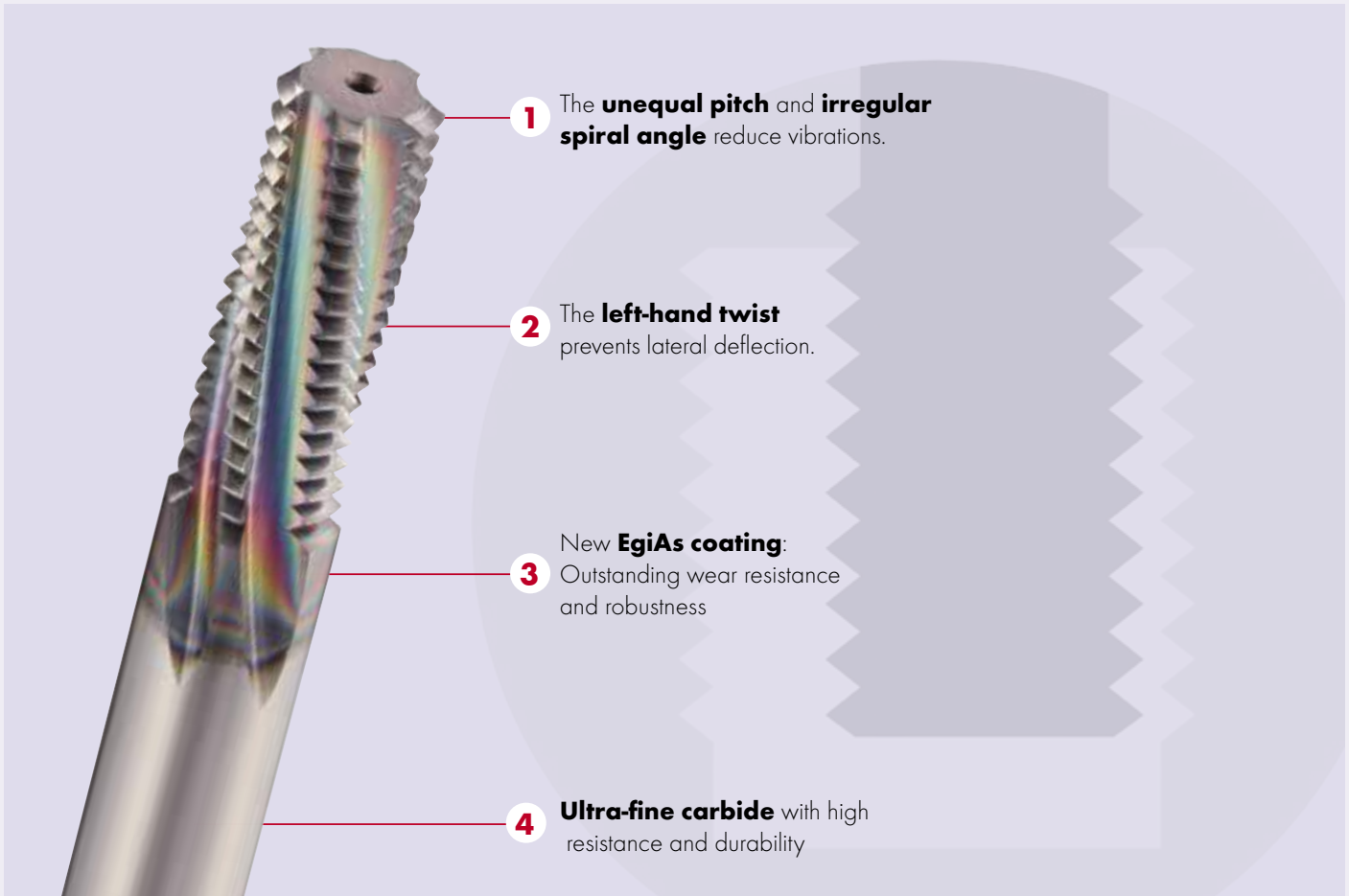
### Metric, full profile, ISO 60°, internal, with internal coolant supply

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
VHTMMI 3 M030 064 06 40	0.50	M3	2.40	6	9.5	64	3	0.04	<b>258026 0010</b>	<b>91,60</b>
VHTMMI 3 M030 064 06 40 L150	0.50	M3	2.40	6	15.0	64	3	0.04	258026 0015	95,10
VHTMMI 3 M040 064 06 40	0.70	M4	3.10	6	12.5	64	3	0.04	258026 0020	91,60
VHTMMI 3 M040 064 06 40 L200	0.70	M4	3.10	6	20.0	64	3	0.04	258026 0025	95,10
VHTMMI 3 M050 064 06 40	0.80	M5	4.00	6	16.0	64	3	0.05	258026 0030	91,60
VHTMMI 3 M050 064 06 40 L250	0.80	M5	4.0	6	25.0	64	3	0.05	258026 0035	95,10
VHTMMI 3 M060 064 06 40	1.00	M6	4.50	6	20.0	64	3	0.06	258026 0040	91,60
VHTMMI 3 M060 070 06 40 L300	1.00	M6	4.50	6	30.0	70	3	0.06	258026 0045	96,70
VHTMMI 4 M080 064 06 40	1.25	M8	6.0	6	24.0	64	4	0.07	258026 0050	91,60
VHTMMI 4 M080 078 06 40 L400	1.25	M8	6.0	6	40.0	78	4	0.07	258026 0055	98,70
VHTMMI 4 M100 078 08 40	1.50	M10	7.50	8	33.0	78	4	0.07	258026 0060	127,50
VHTMMI 4 M100 089 08 40 L500	1.50	M10	7.50	8	50.0	89	4	0.07	258026 0065	142,50
VHTMMI 4 M120 089 10 40	1.75	M12	9.50	10	38.0	89	4	0.07	258026 0070	146,50
VHTMMI 4 M120 110 10 40 L600	1.75	M12	9.50	10	60.0	110	4	0.07	258026 0075	159,-
VHTMMI 4 M160 100 12 40	2.00	M16	12.00	12	50.0	100	4	0.07	258026 0080	234,-
VHTMMI 4 M160 130 12 40 L130	2.00	M16	12.00	12	80.0	130	4	0.07	258026 0085	265,-
VHTMMI 4 M200 102 16 40	2.50	M20	14.95	16	50.0	102	4	0.07	258026 0090	385,-
VHTMMI 4 M240 102 18 40	3.00	M24	17.95	18	50.0	102	4	0.07	258026 0095	425,-
VHTMMI 4 M300 120 20 40	3.50	M30	19.95	20	60.0	120	4	0.07	258026 0100	499,-
VHTMMI 4 M360 120 20 40	4.00	M36	19.95	20	60.0	120	4	0.07	258026 0105	529,-

2166







**The secret of 1-cut machining:**

Evolution from 2-cut machining to 1-cut machining,  
Minimised lateral deflection

<p><b>AT-1</b> Left-hand twist</p>	<p>Conventional thread milling cutter Right-hand twist</p>
<p>Enters the material at the top end <b>Reduced deflection</b> Up-cut milling recommended</p>	<p>Enters the material at the bottom end <b>Strong deflection</b></p>

# 1-cut thread milling cutter AT-1

VHM **DIN 6535 HA** **Z 4** **Z 5** **Z 6** **Vc/fz 809**

- Evolution from 2-cut machining to 1-cut machining
- Unequal pitch and irregular spiral angle reduce vibrations
- Left-hand twist prevents lateral deflection
- New EgiAs coating
- Outstanding wear resistance and robustness
- Ultra-fine carbide with high resistance and durability
- Milling cutter for female threads
- For hardened materials of 25-45 HRC

material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium	copper	graphite	hardened steel		
	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	Co-alloy	GRF/CFP/thermo	< 55 HRC	< 60 HRC	≥ 60 HRC
	●	●	●		●		○	○			○	○		●		
	80-160	80-160	60-120		60-120		80-160	60-120			80-160	100-300		80-200		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

## Metric, ISO full profile, internal

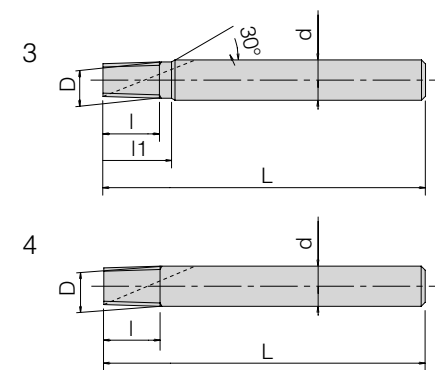
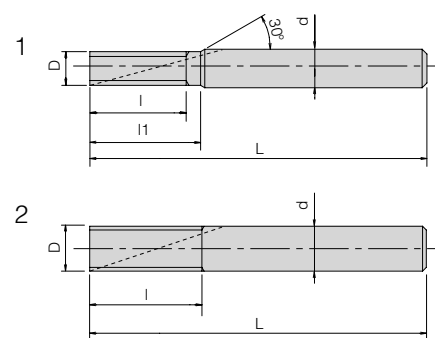
Pitch mm	Standard thread	Fine thread	D mm	d mm	l mm	l1 mm	L mm	Type	Z	art.no.	€
0.75		M6	4.5	6	13.5	16	75	1	4	294300 0001	173,70
1.0	M6		4.5	6	14	16	75	1	4	294300 0002	173,70
0.5		M8	5.7	6	17		75	2	4	294300 0003	174,60
1.0		M8	5.7	6	18		75	2	4	294300 0004	174,60
1.25	M8		5.7	6	18.75		75	2	4	294300 0005	174,60
1.0		M10	7.7	8	22		85	2	4	294300 0006	182,-
1.25		M10	7.7	8	22.5		85	2	4	294300 0007	182,-
1.5	M10		7.7	8	24		85	2	4	294300 0008	182,-
1.0		M12	9.7	10	26		100	2	5	294300 0009	219,20
1.25		M12	9.7	10	27.5		100	2	5	294300 0010	219,20
1.5		M12	9.7	10	27		100	2	5	294300 0011	219,20
1.75	M12		9.7	10	28		100	2	5	294300 0012	219,20
0.5		M14	11.7	12	29		120	2	5	294300 0013	330,90
0.75		M14	11.7	12	30		120	2	5	294300 0014	330,90
1.0		M14	11.7	12	30		120	2	5	294300 0015	330,90
1.5		M14	10.7	12	31.5	34.5	120	1	5	294300 0016	330,90
2.0	M14		9.7	10	32		100	2	5	294300 0017	219,20
1.0		M16	13.7	16	34	39	135	1	5	294300 0018	565,90
1.5		M16	13.7	16	36	39	135	1	5	294300 0019	565,90
2.0	M16		11.7	12	36		120	2	5	294300 0020	330,90
2.5	M18		11.7	12	42.5		120	2	5	294300 0021	330,90
1.5		M20	15.7	16	43.5		135	2	5	294300 0022	565,90
2.5	M20		13.7	16	45	50	135	1	5	294300 0023	565,90
1.5		M24	19.7	20	51		150	2	6	294300 0024	788,70
2.0		M24	19.7	20	52		150	2	6	294300 0025	788,70
3.0	M24		19.7	20	54		150	2	6	294300 0026	788,70

2110

## Whitworth Rc(PT), R (PT) tapered, internal

Pitch TPI	Standard thread	D mm	d mm	l mm	l1 mm	L mm	Type	Z	art.no.	€
28	1/16	5.67	6	9.1		60	4	4	294301 0001	198,70
28	1/8	7.67	8	9.1	12.7	60	3	4	294301 0002	182,-
19	1/4 3/8	9.67	10	14.7		75	4	5	294301 0003	219,20
19	3/8	11.67	12	14.7	20	85	3	5	294301 0004	372,80
14	1/2 3/4	11.67	12	20		85	4	5	294301 0005	372,80
14	3/4	15.67	16	20		95	4	5	294301 0006	565,90
11	1-2	19.67	20	27.7		105	4	6	294301 0007	607,30

2110



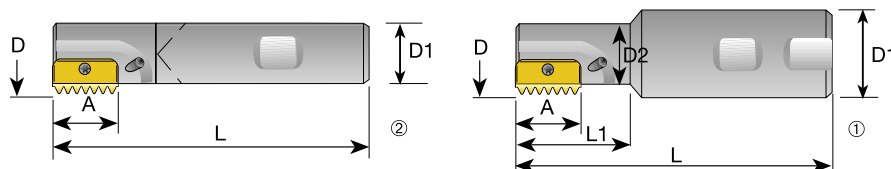
## ATORN® Holder for thread mill inserts



- With internal cooling
- Supplied with clamping screw and chuck key
- Force-fit insert seat due to 15° bevel on the milling insert

### Standard holder

- Straight shank in accordance with DIN 1835B
- Holder SR0009H12 not for use with the following inserts: 12-18 NPT/NPTF, 12-19 BSPT
- Holder SR0018H21 not for use with the following inserts: 21 I34 ISO, 21 I 8 UN, 21 I 7 UN, 21-11 BSPT, 21-11.5 NPT, 21-11.5 NPTF

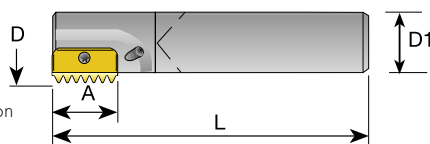


Designation	A mm	D mm	D1 mm	D2 mm	L mm	L1 mm	Illustration	art.no.	€
SR0009 H12	12	9.5	20	7.5	85	14	1 A1 B1	259001 0912	160,-
SR0010 H12	12	9.9	20	7.6	85	16	1 A1 B1	259001 1012	204,-
SR0012 F14	14	12	20	8.9	75	20	1 A2 B1	259001 1214	145,50
SR0014 H14	14	14.5	20	11.2	85	25	1 A2 B1	259001 1414	160,-
SR0017 H14	14	17.0	20	13.4	85	30	1 A2 B1	259001 1714	170,-
SR0018 H21	21	18.0	20	14.4	85	30	1 A3 B2	259001 1821	229,-
SR0021 H21	21	21.0	20	16.5	94	40	1 A3 B2	259001 2121	234,-
SR0025 K21	21	25.0	20	-	125	-	2 A3 B2	259001 2521	260,-
SR0029 J30	30	29.0	25	22.4	110	50	1 A4 B3	259001 2930	285,-
SR0031 M30	30	31.0	25	-	150	-	2 A4 B3	259001 3130	290,-
SR0038 M30	30	38.0	32	-	150	-	2 A4 B3	259001 3830	306,-
SR0048 M40	40	48.0	40	35.0	153	78	1 A5 B3	259001 4840	390,-

2116

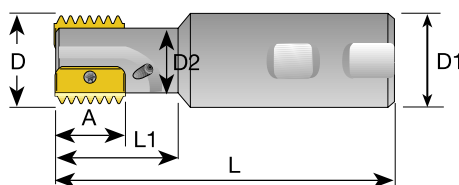
### Solid carbide holder

- Long version
- Particularly low-vibration thanks to solid carbide construction
- Straight shank
- SR0010 K12C without internal cooling



Designation	A mm	D mm	D1 mm	L mm	art.no.	€
SR0010 K12C	12	9.9	8	125	259002 1012	410,-
SR0013 H14C	14	13.2	10	110	259002 1214	341,-
SR0013 J14C	14	13.2	10	155	259002 1314	355,-
SR0015 K14C	14	15.2	12	175	259002 1514	440,-
SR0021 K21C	21	21.0	16	130	259002 2125	619,-
SR0021 M21C	21	21.0	16	200	259002 2121	639,-
SR0027 S30C	30	27.0	20	270	259002 2730	1.029,-

2116



### Double-seat holder

- For use with two thread mill inserts
- For increased feed rates and specially for hard materials
- Straight shank in accordance with DIN 1835B

Designation	A mm	D mm	D1 mm	D2 mm	L mm	L1 mm	art.no.	€
SR0020 H14-2	14	20.0	20	16.0	93	41	259003 2014	355,-
SR0030 J21-2	21	30.0	25	24.0	108	52	259003 3021	430,-
SR0040 L30-2	30	40.0	32	30.0	130	70	259003 4030	509,-
SR0050 M40-2	40	50.0	40	38.0	153	78	259003 5040	589,-

2116

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	259501 9000	2,09	B1	703040 0080	4,63
A2	259501 9001	2,09	B2	703040 0150	4,84
A3	259501 9002	1,99	B3	703040 0250	6,10
A4	259501 9003	3,87			
A5	259501 9004	3,87			

3116

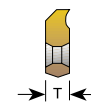
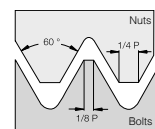
7111

# ATORN® ISO thread mill inserts

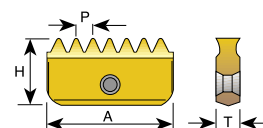


- Metric, full profile, ISO
- Carbide quality AMT7

TiAlN-coated ultra-fine grain quality for universal applications in all materials at medium to high cutting speeds



Size A inserts = 12 mm have one cutting edge!



## Full profile, 60°, internal

A mm	Pitch P mm	H mm	T mm	Designation	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
12	0.5	6.3	2.9	12 I 0.5 ISO	0.05-0.15	5 259501 4135	43,30
12	0.75	6.3	2.9	12 I 0.75 ISO	0.05-0.15	5 259501 4235	43,30
12	1.0	6.3	2.9	12 I 1.0 ISO	0.05-0.15	5 259501 4335	43,30
12	1.25	6.3	2.9	12 I 1.25 ISO	0.05-0.15	5 259501 4435	43,30
12	1.5	6.3	2.9	12 I 1.5 ISO	0.05-0.15	5 259501 4535	43,30
14	0.5	7.5	3.1	14 I 0.5 ISO	0.05-0.15	5 259501 0135	43,30
14	0.75	7.5	3.1	14 I 0.75 ISO	0.05-0.15	5 259501 0235	43,30
14	1.0	7.5	3.1	14 I 1.0 ISO	0.05-0.15	5 259501 0335	43,30
14	1.25	7.5	3.1	14 I 1.25 ISO	0.05-0.15	5 259501 0435	43,30
14	1.5	7.5	3.1	14 I 1.5 ISO	0.05-0.15	5 259501 0535	43,30
14	1.75	7.5	3.1	14 I 1.75 ISO	0.05-0.15	5 259501 0835	43,30
14	2.0	7.5	3.1	14 I 2.0 ISO	0.05-0.15	5 259501 0635	43,30
14	2.5	7.5	3.1	14 I 2.5 ISO	0.05-0.15	5 259501 0735	43,30
21	1.0	12	4.7	21 I 1.0 ISO	0.05-0.15	5 259501 1035	56,50
21	1.5	12	4.7	21 I 1.5 ISO	0.05-0.15	5 259501 1135	56,50
21	1.75	12	4.7	21 I 1.75 ISO	0.05-0.15	5 259501 1635	56,50
21	2.0	12	4.7	21 I 2.0 ISO	0.05-0.15	5 259501 1235	56,50
21	2.5	12	4.7	21 I 2.5 ISO	0.05-0.15	5 259501 1335	56,50

2117

A mm	Pitch P mm	H mm	T mm	Designation	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
21	3.0	12	4.7	21 I 3.0 ISO	0.05-0.15	5 259501 1435	56,50
21	3.5	12	4.7	21 I 3.5 ISO	0.05-0.15	5 259501 1535	56,50
30	1.5	16	5.5	30 I 1.5 ISO	0.05-0.15	5 259501 2035	77,90
30	2.0	16	5.5	30 I 2.0 ISO	0.05-0.15	5 259501 2135	77,90
30	3.0	16	5.5	30 I 3.0 ISO	0.05-0.15	5 259501 2235	77,90
30	3.5	16	5.5	30 I 3.5 ISO	0.05-0.15	5 259501 2435	77,90
30	4.0	16	5.5	30 I 4.0 ISO	0.05-0.15	5 259501 2335	77,90
30	4.5	16	5.5	30 I 4.5 ISO	0.05-0.15	5 259501 3635	77,90
30	5.0	16	5.5	30 I 5.0 ISO	0.05-0.15	5 259501 2535	77,90
40	1.5	20	6.3	40 I 1.5 ISO	0.05-0.15	2 259501 3035	136,50
40	2.0	20	6.3	40 I 2.0 ISO	0.05-0.15	2 259501 3135	136,50
40	3.0	20	6.3	40 I 3.0 ISO	0.05-0.15	2 259501 3235	136,50
40	3.5	20	6.3	40 I 3.5 ISO	0.05-0.15	2 259501 3735	136,50
40	4.0	20	6.3	40 I 4.0 ISO	0.05-0.15	2 259501 3335	136,50
40	4.5	20	6.3	40 I 4.5 ISO	0.05-0.15	2 259501 3835	136,50
40	5.0	20	6.3	40 I 5.0 ISO	0.05-0.15	2 259501 3435	136,50
40	5.5	20	6.3	40 I 5.5 ISO	0.05-0.15	2 259501 3935	136,50
40	6.0	20	6.3	40 I 6.0 ISO	0.05-0.15	2 259501 3535	136,50

2117

## Full profile, 60°, external

A mm	Pitch P mm	H mm	T mm	Designation	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
14	0.75	7.5	3.1	14 E 0.75 ISO	0.05-0.15	5 259502 0135	43,30
14	1.0	7.5	3.1	14 E 1.0 ISO	0.05-0.15	5 259502 0235	43,30
14	1.25	7.5	3.1	14 E 1.25 ISO	0.05-0.15	5 259502 0335	43,30
14	1.5	7.5	3.1	14 E 1.5 ISO	0.05-0.15	5 259502 0435	43,30
14	1.75	7.5	3.1	14 E 1.75 ISO	0.05-0.15	5 259502 0735	43,30
14	2.0	7.5	3.1	14 E 2.0 ISO	0.05-0.15	5 259502 0535	43,30
14	2.5	7.5	3.1	14 E 2.5 ISO	0.05-0.15	5 259502 0635	43,30
21	1.0	12	4.7	21 E 1.0 ISO	0.05-0.15	5 259502 1035	56,50
21	1.5	12	4.7	21 E 1.5 ISO	0.05-0.15	5 259502 1135	56,50
21	2.0	12	4.7	21 E 2.0 ISO	0.05-0.15	5 259502 1235	56,50
21	2.5	12	4.7	21 E 2.5 ISO	0.05-0.15	5 259502 1335	56,50
21	3.0	12	4.7	21 E 3.0 ISO	0.05-0.15	5 259502 1435	56,50

2117

A mm	Pitch P mm	H mm	T mm	Designation	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
30	1.5	16	5.5	30 E 1.5 ISO	0.05-0.15	5 259502 2035	77,90
30	2.0	16	5.5	30 E 2.0 ISO	0.05-0.15	5 259502 2135	77,90
30	3.0	16	5.5	30 E 3.0 ISO	0.05-0.15	5 259502 2235	77,90
30	3.5	16	5.5	30 E 3.5 ISO	0.05-0.15	5 259502 2435	77,90
30	4.0	16	5.5	30 E 4.0 ISO	0.05-0.15	5 259502 2335	77,90
40	1.5	20	6.3	40 E 1.5 ISO	0.05-0.15	2 259502 3035	136,50
40	2.0	20	6.3	40 E 2.0 ISO	0.05-0.15	2 259502 3135	136,50
40	3.0	20	6.3	40 E 3.0 ISO	0.05-0.15	2 259502 3235	136,50
40	4.0	20	6.3	40 E 4.0 ISO	0.05-0.15	2 259502 3335	136,50
40	5.0	20	6.3	40 E 5.0 ISO	0.05-0.15	2 259502 3435	136,50
40	6.0	20	6.3	40 E 6.0 ISO	0.05-0.15	2 259502 3535	136,50

2117

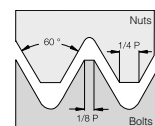
## ATORN® UN thread mill inserts



- Metric, full profile, UN
- Carbide quality AMT7

TiAlN-coated ultra-fine grain quality for universal applications in all materials at medium to high cutting speeds

- Other thread pitches available on request



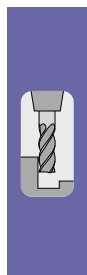
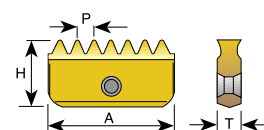
### Full profile, UN, internal

A mm	Pitch TPI	H mm	T mm	Designation	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
12	32	6.3	2.9	12 I 32 UN	0.05-0.15	5 259503 4135	43,30
12	28	6.3	2.9	12 I 28 UN	0.05-0.15	5 259503 4235	43,30
12	24	6.3	2.9	12 I 24 UN	0.05-0.15	5 259503 4335	43,30
12	20	6.3	2.9	12 I 20 UN	0.05-0.15	5 259503 4435	43,30
12	18	6.3	2.9	12 I 18 UN	0.05-0.15	5 259503 4535	43,30
12	16	6.3	2.9	12 I 16 UN	0.05-0.15	5 259503 4635	43,30
14	32	7.5	3.1	14 I 32 UN	0.05-0.15	5 259503 0135	43,30
14	28	7.5	3.1	14 I 28 UN	0.05-0.15	5 259503 0235	43,30
14	24	7.5	3.1	14 I 24 UN	0.05-0.15	5 259503 0335	43,30
14	20	7.5	3.1	14 I 20 UN	0.05-0.15	5 259503 0435	43,30
14	18	7.5	3.1	14 I 18 UN	0.05-0.15	5 259503 0535	43,30
14	16	7.5	3.1	14 I 16 UN	0.05-0.15	5 259503 0635	43,30
14	14	7.5	3.1	14 I 14 UN	0.05-0.15	5 259503 0735	43,30
14	12	7.5	3.1	14 I 12 UN	0.05-0.15	5 259503 0835	43,30
21	24	12	4.7	21 I 24 UN	0.05-0.15	5 259503 1035	56,50
21	20	12	4.7	21 I 20 UN	0.05-0.15	5 259503 1135	56,50
21	18	12	4.7	21 I 18 UN	0.05-0.15	5 259503 1235	56,50
21	16	12	4.7	21 I 16 UN	0.05-0.15	5 259503 1335	56,50
21	14	12	4.7	21 I 14 UN	0.05-0.15	5 259503 1435	56,50
21	12	12	4.7	21 I 12 UN	0.05-0.15	5 259503 1535	56,50
21	10	12	4.7	21 I 10 UN	0.05-0.15	5 259503 1635	56,50
30	20	16	5.5	30 I 20 UN	0.05-0.15	5 259503 2035	77,90
30	18	16	5.5	30 I 18 UN	0.05-0.15	5 259503 2135	77,90
30	16	16	5.5	30 I 16 UN	0.05-0.15	5 259503 2235	77,90
30	14	16	5.5	30 I 14 UN	0.05-0.15	5 259503 2335	77,90
30	12	16	5.5	30 I 12 UN	0.05-0.15	5 259503 2435	77,90
30	10	16	5.5	30 I 10 UN	0.05-0.15	5 259503 2535	77,90
30	8	16	5.5	30 I 8 UN	0.05-0.15	5 259503 2635	77,90
30	6	16	5.5	30 I 6 UN	0.05-0.15	5 259503 2735	77,90
40	14	20	6.3	40 I 14 UN	0.05-0.15	5 259503 3035	136,50
40	12	20	6.3	40 I 12 UN	0.05-0.15	2 259503 3135	136,50
40	10	20	6.3	40 I 10 UN	0.05-0.15	2 259503 3235	136,50
40	8	20	6.3	40 I 8 UN	0.05-0.15	2 259503 3335	136,50
40	6	20	6.3	40 I 6 UN	0.05-0.15	2 259503 3435	136,50

2117



Size A inserts = 12 mm have one cutting edge



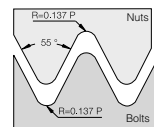
## ATORN® BSW/NPT thread mill inserts



- BSW, NPT
- Carbide quality AMT7

TiAlN-coated ultra-fine grain quality for universal applications in all materials at medium to high cutting speeds

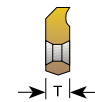
- Other versions available on request (NPTF, BSPT, NPS and NPSF)



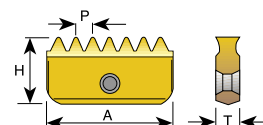
### BSW, internal = external

A mm	Pitch TPI	H mm	T mm	Designation	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
12	19	6.3	2.9	12-19 W	0.05-0.15	5 259505 0035	43,30
14	24	7.5	3.1	14-24 W	0.05-0.15	5 259505 0135	43,30
14	20	7.5	3.1	14-20 W	0.05-0.15	5 259505 0235	43,30
14	19	7.5	3.1	14-19 W	0.05-0.15	5 259505 0335	43,30
14	16	7.5	3.1	14-16 W	0.05-0.15	5 259505 0435	43,30
14	14	7.5	4.7	14-14 W	0.05-0.15	5 259505 0535	43,30
21	20	12	4.7	21-20 W	0.05-0.15	5 259505 1035	56,50
21	19	12	4.7	21-19 W	0.05-0.15	5 259505 1135	56,50
21	16	12	4.7	21-16 W	0.05-0.15	5 259505 1235	56,50
21	14	12	4.7	21-14 W	0.05-0.15	5 259505 1335	56,50
21	11	12	4.7	21-11 W	0.05-0.15	5 259505 1435	56,50
30	16	16	5.5	30-16 W	0.05-0.15	5 259505 2035	77,90
30	14	16	5.5	30-14 W	0.05-0.15	5 259505 2135	77,90
30	11	16	5.5	30-11 W	0.05-0.15	5 259505 2235	77,90
40	11	20	6.3	40-11 W	0.05-0.15	2 259505 3035	136,50
40	8	20	6.3	40- 8 W	0.05-0.15	2 259505 3135	136,50

2117



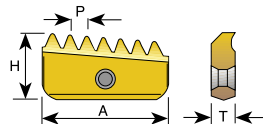
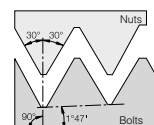
Size A inserts = 12 mm have one cutting edge!



### NPT, internal = external

A mm	Pitch TPI	H mm	T mm	Designation	Feed fz steel < 1000 N/mm <sup>2</sup> mm/tooth	art.no.	€
12	18.0	6.3	2.9	12-18 NPT	0.05-0.15	5 259506 0035	47,50
14	18.0	7.5	3.1	14-18 NPT	0.05-0.15	5 259506 0135	47,50
14	14.0	7.5	3.1	14-14 NPT	0.05-0.15	5 259506 0235	47,50
21	14.0	12	4.7	21-14 NPT	0.05-0.15	5 259506 1035	62,60
21	11.5	12	4.7	21-11.5 NPT	0.05-0.15	5 259506 1135	62,60
30	11.5	16	5.5	30-11.5 NPT	0.05-0.15	5 259506 2035	86,50
30	8.0	16	5.5	30- 8 NPT	0.05-0.15	5 259506 2135	86,50
40	11.5	20	6.3	40-11.5 NPT	0.05-0.15	2 259506 3035	149,50
40	8.0	20	6.3	40- 8 NPT	0.05-0.15	2 259506 3135	149,50

2117



Inserts for conical threads have one cutting edge!

Over 200,000 tools available online!

#### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

[www.saratools.com](http://www.saratools.com)



# ATORN® Tool system for machining drill holes MINI-MILL



- Type ZH 22 from bore Ø 22 mm
- Solid carbide inserts, quality grade **HC 8620**
- **Solid carbide milling cutter shank** with internal coolant supply
- **Steel milling cutter shank** with internal coolant supply
- 3-rib toothing
- For machining grooves, circlip grooves, ISO metric threads, Whitworth pipe threads and full radius grooves, as well as for chamfering and deburring

**Further tools for bore diameters 10 to 33 mm available on request**



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper Cu-alloy	graphite GRP/CFP/thermo.	hardened steel		
	○ well suited	< 700 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>	< 1400 N/mm <sup>2</sup>	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si			< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	○		●	●	○	○	○	○	○	○		○		



## DIN 6535 HA solid carbide shank

Designation	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm			art.no.	€
ZH22,1212..42.A.HM	-	100	42	21.7	4.5	A1	B1	<b>263001</b> 1242	190,50
ZH22,1212..60.A.HM	-	130	60	21.7	4.5	A1	B1	263001 1260	226,-
ZH22,1611..30.A.HM	11.5	90	30	21.7	3.9	A1	B1	263001 1630	242,-
ZH22,1612..42.A.HM	12.0	100	42	21.7	4.5	A1	B1	263001 1642	252,-
ZH22,1612..60.A.HM	12.0	130	60	21.7	4.5	A1	B1	263001 1660	304,-
ZH22,1612..85.A.HM	12.0	160	85	21.7	4.5	A1	B1	263001 1685	344,-
ZH22,2016..45.A.HM	16.0	110	45	21.7	2.5	A1	B1	263001 2045	370,-
ZH22,2016..65.A.HM	16.0	130	65	21.7	2.5	A1	B1	263001 2065	375,-

2141



## DIN 1835 A steel shank

Designation	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm			art.no.	€
ZH22,1011,10.A.ST	11.3	60	10.7	21.7	4.5	A1	B1	<b>263005</b> 0010	121,50
ZH22,1311,25.A.ST	11.3	70	25.7	21.7	4.0	A1	B1	263005 0025	125,50
ZH22,1612,24.A.ST	12.0	80	24.0	21.7	4.5	A1	B1	263005 0024	135,-

2141



## DIN 6535 HB solid carbide

Designation	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm			art.no.	€
ZH22,1212..42.B.HM	-	100	42	21.7	4.5	A1	B1	<b>263002</b> 1242	190,50
ZH22,1212..60.B.HM	-	130	60	21.7	4.5	A1	B1	263002 1260	226,-
ZH22,1611..30.B.HM	11.5	90	30	21.7	3.9	A1	B1	263002 1630	242,-
ZH22,1612..42.B.HM	12.0	100	42	21.7	4.5	A1	B1	263002 1642	252,-
ZH22,1612..60.B.HM	12.0	130	60	21.7	4.5	A1	B1	263002 1660	304,-
ZH22,1612..85.B.HM	12.0	160	85	21.7	4.5	A1	B1	263002 1685	344,-
ZH22,2016..45.B.HM	16.0	110	45	21.7	2.5	A1	B1	263002 2045	370,-
ZH22,2016..65.B.HM	16.0	130	65	21.7	2.5	A1	B1	263002 2065	375,-

2141



## DIN 1835 B steel shank

Designation	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm			art.no.	€
ZH22,1612,24.B.ST	12.0	80	24	21.7	4.5	A1	B1	<b>263004</b> 0024	135,-

2141

### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 263999 0001	3,77		B1 703053 0200	1,93	
2141			7114		

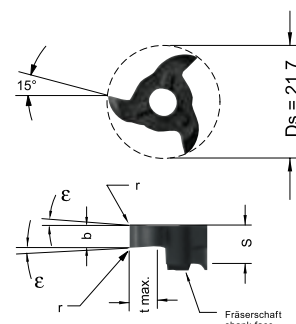
Continued on next page >>>



**Cutting inserts for DIN 471/472 circlip grooves**

Designation	S mm	r mm	$\epsilon$ °	t max. mm	b-0.02 mm	HC8620	
						art.no.	€
Z 22,0070,00	5.7	-	1.0	1.5	0.74	263100 0007	37,50
Z 22,0080,00	5.7	-	1.0	1.7	0.84	263100 0008	37,50
Z 22,0090,00	5.7	-	1.0	1.9	0.94	263100 0009	33,50
Z 22,0100,00	5.7	-	1.0	2.1	1.04	263100 0010	35,40
Z 22,0110,00	5.7	-	1.0	2.5	1.21	263100 0011	35,40
Z 22,0130,00	5.7	0.1	3.0	4.5	1.41	263100 0013	33,80
Z 22,0160,00	5.7	0.1	3.0	4.5	1.71	263100 0016	33,80
Z 22,0185,02	5.7	0.15	3.0	4.5	1.96	263100 0185	33,80
Z 22,0215,02	5.7	0.15	3.0	4.5	2.26	263100 0215	33,80
Z 22,0265,02	5.7	0.15	3.0	4.5	2.76	263100 0265	33,80
Z 22,0315,02	5.7	0.15	3.0	4.5	3.26	263100 0315	33,80
Z 22,0415,02	5.7	0.15	3.0	4.5	4.26	263100 0414	33,80
Z 22,0515,02	5.7	0.15	3.0	4.5	5.26	263100 0515	33,80

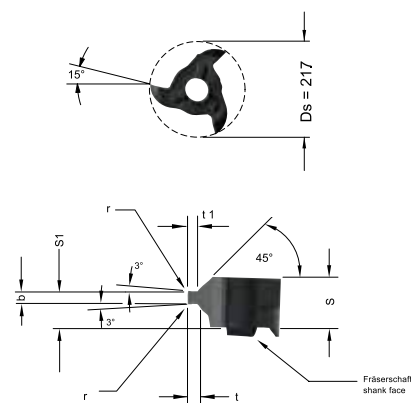
2141



**Cutting inserts with groove outer edge chamfering for DIN 471/472 circlip grooves**

Designation	S mm	s1 mm	r mm	b-0.02 mm	t mm	t1 max. mm	HC8620	
							art.no.	€
Z 22,1105,30	5.85	5.07	-	1.21	0.5	0.49	263101 1105	36,80
Z 22,1307,30	5.85	5.17	-	1.41	0.7	0.67	263101 1307	36,80
Z 22,1308,30	5.85	5.17	-	1.41	0.85	0.83	263101 1308	36,80
Z 22,1609,35	5.85	5.07	-	1.71	0.85	0.83	263101 1609	36,80
Z 22,1610,35	5.85	5.07	-	1.71	1.0	0.97	263101 1610	36,80
Z 22,1812,35	5.85	5.19	0.15	1.96	1.25	1.23	263101 1812	36,80
Z 22,2215,35	5.85	5.34	0.15	2.26	1.5	1.47	263101 2215	36,80
Z 22,2616,45	5.85	5.09	0.15	2.76	1.5	1.47	263101 2616	36,80
Z 22,2617,45	5.85	5.09	0.15	2.76	1.75	1.72	263101 2617	36,80
Z 22,3118,45	5.85	5.34	0.20	3.26	1.75	1.72	263101 3118	36,80
Z 22,4120,55	5.85	5.34	0.20	4.26	2.0	1.97	263101 4120	36,80
Z 22,4125,55	5.85	5.34	0.20	4.26	2.5	2.47	263101 4125	36,80

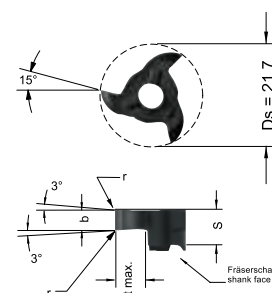
2141



**Cutting inserts for general groove milling**

Designation	S mm	r mm	b +0.02 mm	t max. mm	HC8620	
					art.no.	€
Z 22,0150,02	5.7	0.2	1.5	4.5	263102 0015	34,50
Z 22,0200,02	5.7	0.2	2.0	4.5	263102 0020	34,50
Z 22,0250,02	5.7	0.2	2.5	4.5	263102 0025	34,50
Z 22,0300,02	5.7	0.2	3.0	4.5	263102 0030	34,50
Z 22,0400,02	5.7	0.2	4.0	4.5	263102 0040	34,50

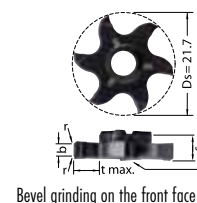
2141



**6-tooth cutting inserts for general groove milling**

Designation	S mm	r mm	b mm	t max. mm	HC8620	
					art.no.	€
Z622,0150,01	6.2	0.1	1.5	4.5	263108 0015	58,-
Z622,0200,02	6.2	0.2	2.0	4.5	263108 0020	58,-
Z622,0250,02	6.2	0.2	2.5	4.5	263108 0025	58,-
Z622,0300,02	6.2	0.2	3.0	4.5	263108 0030	58,-
Z622,0400,02	6.2	0.2	4.0	4.5	263108 0040	58,-

2141

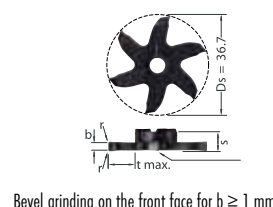


**6-tooth cutting inserts for general groove milling**

• t-max. 12 mm only with holder ZH22

Designation	S mm	r mm	b mm	t max. mm	D min. mm	HC8620	
						art.no.	€
Z637,0050,00	5.85	-	0.5	12.0	37.0	263111 0005	97,20
Z637,0100,01	5.85	0.1	1.0	12.0	37.0	263111 0010	88,50
Z637,0150,01	5.85	0.1	1.5	12.0	37.0	263111 0015	79,40

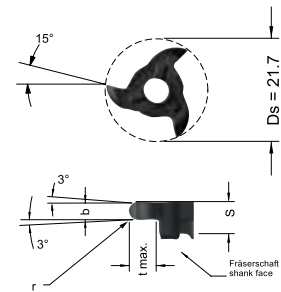
2141



**Cutting inserts for full radius grooves**

Designation	S mm	r mm	b +0.03 mm	t max. mm	HC8620	
					art.no.	€
Z 22,0005,10	5,75	0.5	1.0	4.5	263103 0010	39,70
Z 22,0010,20	5,75	1.0	2.0	4.5	263103 0020	39,70
Z 22,0014,28	5,75	1.4	2.8	4.5	263103 0028	41,-
Z 22,0015,30	5,75	1.5	3.0	4.5	263103 0030	39,70
Z 22,0020,40	5,75	2.0	4.0	4.5	263103 0040	39,70

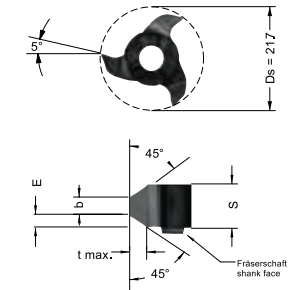
2141



**Bore milling cutter inserts, front and rear-side chamfering**

Designation	S mm	E mm	b mm	t max. mm	HC8620	
					art.no.	€
Z 22,4545,58	5.85	2.00	2.0	1.7	263106 0015	29,50
Z 22,4545,94	9.4	3.25	3.0	3.0	263106 0020	31,-

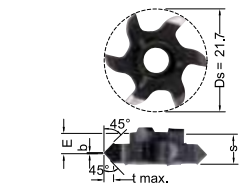
2141



**Bore milling cutter inserts, front and rear-side chamfering with 6 teeth**

Designation	S mm	E mm	b +0.03 mm	t max. mm	HC8620	
					art.no.	€
Z622,4545,63	6.4	3.9	0.2	1.9	263109 0015	58,50

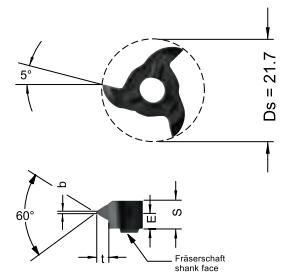
2141



**Cutting inserts for ISO metric threads, partial profile**

Designation	S mm	Pitch P mm	E mm	b mm	t mm	HC8620	
						art.no.	€
Z 22,0720,01	5.85	1.0 - 2.0	4.6	0.12	1.19	263104 1020	43,20
Z 22,2545,01	5.85	2.0 - 4.5	3.7	0.31	2.71	263104 2545	44,60
Z 22,0815,01	5.85	1.5 - 2.75	4.8	0.18	1.62	263104 0015	43,20
Z 22,1020,01	5.85	2.0 - 3.75	4.6	0.25	2.22	263104 0020	43,20
Z 22,1630,01	5.85	2.5 - 5.0	4.3	0.37	2.98	263104 0030	43,30

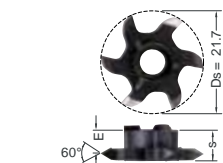
2141



**Cutting inserts for ISO metric threads, internal, partial profile, 6 teeth**

Designation	S mm	Pitch P mm	E mm	Thread nominal Ø mm	HC8620	
					art.no.	€
Z622,0720,01	6.20	1.0 - 2.0	5.1	> 27.0	263110 1020	68,70
Z622,2545,01	6.05	2.0 - 4.5	4.3	> 33.0	263110 2545	70,20

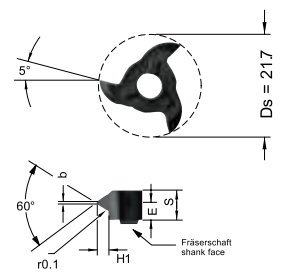
2141



**Cutting inserts for ISO metric threads, full profile**

Designation	S mm	Pitch P mm	E mm	b mm	H1 mm	HC8620	
						art.no.	€
Z 22,0815,02	5.85	1.5	4.8	0.18	0.81	263105 0150	45,30
Z 22,0917,02	5.85	1.75	4.7	0.20	0.95	263105 0175	45,30
Z 22,1020,02	5.85	2.0	4.6	0.25	1.08	263105 0200	47,40
Z 22,1630,02	5.85	3.0	4.3	0.37	1.62	263105 0300	47,40
Z 22,1835,02	5.85	3.5	4.1	0.43	1.89	263105 0350	50,90
Z 22,2140,02	5.85	4.0	3.9	0.5	2.16	263105 0400	50,90
Z 22,2445,02	5.85	4.5	3.7	0.56	2.43	263105 0450	50,90

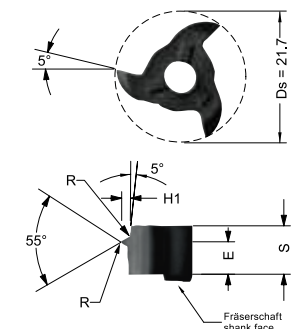
2141



**Cutting inserts for Whitworth pipe threads, DIN ISO 228 (259) + 2999 full profile**

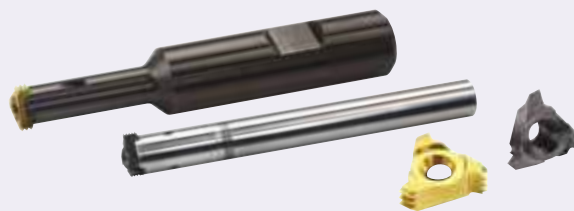
Designation	S mm	Pitch TPI	E mm	R mm	H1 mm	HC8620	
						art.no.	€
Z 22,5506,02	5.85	6 (4.23)	3.1	0.58	2.71	263107 0060	57,-
Z 22,5508,02	5.85	8 (3.17)	3.5	0.43	2.03	263107 0080	57,-
Z 22,5511,02	5.85	11 (2.30)	4.0	0.31	1.48	263107 0011	53,40

2141



### Removable, vertical thread-mill inserts and holders for a variety of thread profiles

- Front-mounted plate for high precision and excellent performance
- Milling with high cutting rates and perfect surface finish
- Stable and precise clamping for consistent reproducibility
- Same plate for right-hand and left-hand threads
- Tool holders with Weldon shank and internal cooling
- Plates for countersinking, grooving and face milling

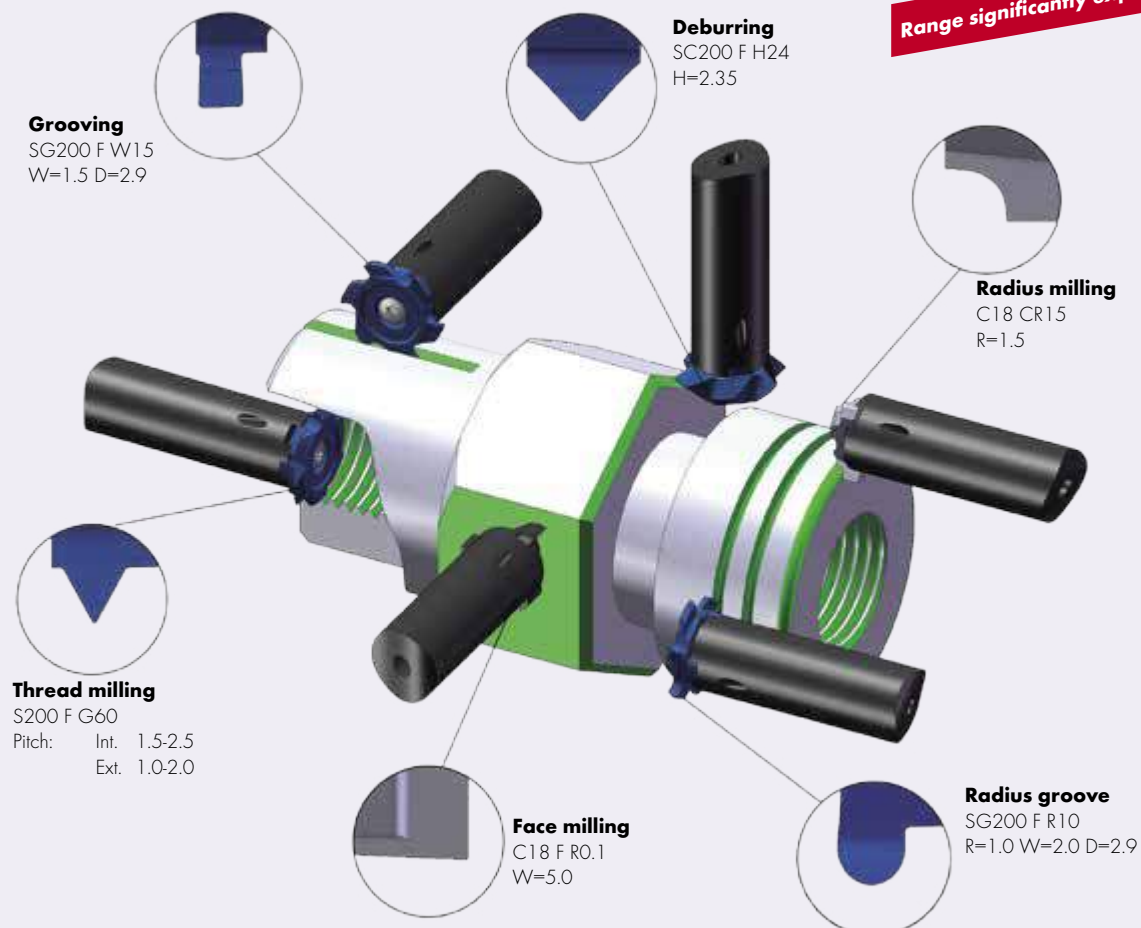


### One holder for all machining situations

SRC 2018 J with internal coolant supply

Tool system for  
vertical thread milling

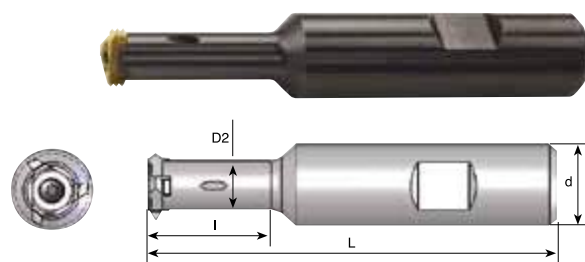
Range significantly expanded



## ATORN® CMT clamp mounting for vertical thread milling



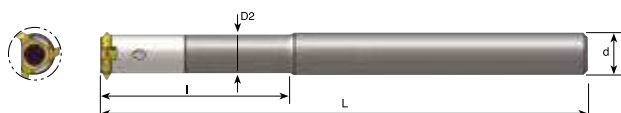
- Solid carbide milling cutter shank with internal coolant supply
- Steel milling cutter shank with internal coolant supply



### DIN 6535 HB steel shank with internal coolant supply

Model	Holder	Insert size mm	d mm	D2 mm	l mm	L mm			art.no.	€
SRC 1210 E	H1	C10	12	7.3	19	70	A1	B1	266001 0001	144,50
SRC 1610 G	H2	C10	16	7.3	19	90	A1	B1	266001 0002	144,50
SRC 1212 E	H3	C12, S17	12	9.0	25	70	A2	B2	266001 0003	144,50
SRC 1612 G	H4	C12, S17	16	9.0	25	90	A2	B2	266001 0004	144,50
SRC 1612 H	H5	C12, S17	16	9.0	35	100	A2	B2	266001 0005	160,-
SRC 1618 H	H6	C18, S20	16	13.8	48	100	A3	B2	266001 0006	163,-
SRC 2018 H	H7	C18, S20	20	13.8	32	100	A3	B2	266001 0007	163,-
SRC 2018 J	H8	C18, S20	20	13.8	48	110	A3	B2	266001 0008	167,-
SRC 2018 L	H9	C18, S20	20	13.8	74	140	A3	B2	266001 0009	190,50
SRC 2525 J	H10	C25	25	17.5	45	115	A4	B3	266001 0010	229,-
SRC 2525 M	H11	C25	25	17.5	80	150	A4	B3	266001 0011	250,-
SRC 1210 F	H1,1	C10	12	8.0	25	80	A1	B1	266001 0012	144,50
SRC 1212 G	H3,1	C12, S17	12	10.0	40	90	A2	B2	266001 0013	144,50
SRC 1618 F	H5,1	C18, S20	16	12.0	25	80	A3	B3	266001 0014	163,-
SRC 1618 G	H5,2	C18, S20	16	12.0	40	90	A3	B3	266001 0015	163,-
SRC 2035 K	H12	S35	20	22.0	44	130		B4	266001 0016	250,-
SRC 2535 H	H13	S35	25	22.0	40	100		B4	266001 0017	229,-
SRC 2535 K	H14	S35	25	22.0	60	130		B4	266001 0018	250,-

2150



### DIN 1835 A solid carbide shank with internal coolant supply

Model	Holder	Insert size mm	d mm	D2 mm	l mm	L mm			art.no.	€
CRC 0810 L35 K	H15	C10	8	7.3	35	125	A1	B1	266002 0001	249,-
CRC 0810 K	H16	C10	8	8.0	-	125	A1	B1	266002 0002	259,-
CRC 1012 M	H19	C12, S17	10	10.0	-	150	A3	B2	266002 0003	265,-
CRC 1218 P	H21	C18, S20	12	12.0	-	170	A3	B2	266002 0004	390,-
CRC 1625 R	H24	C25	16	16.0	-	205	A4	B3	266002 0005	455,-
CRC 2025 L85 S	H25	C25	20	17.5	85	250	A4	B3	266002 0006	639,-
CRC 1010 L45 M	H17	C10	10	7.3	45	150	A1	B1	266002 0007	284,-
CRC 1012 L40 M	H18	C12, S17	10	9.0	40	150	A3	B2	266002 0008	284,-
CRC 1212 L57 P	H20	C12, S17	12	9.0	57	165	A3	B2	266002 0009	420,-
CRC 1618 L48 R	H22	C18, S20	16	13.8	48	195	A3	B2	266002 0010	490,-
CRC 1618 L74 R	H23	C18, S20	16	13.8	74	195	A3	B2	266002 0011	509,-
CRC 2035 S	H26	S35	20	22.0	37	260		B4	266002 0012	689,-

2150

### Spare parts

Screw			Wrench		
	art.no.	€		art.no.	€
A1	259501 9009	4,48	B1	705141 0006	4,82
A2	259501 9010	4,48	B2	705141 0010	5,75
A3	341401 0011	1,67	B3	705141 0025	7,65
A4	341401 0041	3,80	B4	705141 0030	12,20
3116			7114		

Continued on next page &gt;&gt;&gt;

**CMT Starter Kit**• **Set, consisting of:**

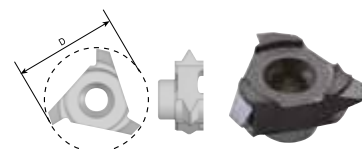
- Steel mounting SRC 2018 J
- Partial profile insert S200 F G60 for internal pitch 1.5-2.5 mm, external pitch 1.0-2.0 mm
- Chamfer insert SC20 F H24 90°
- Recessing insert SG200 F W15 1.5 mm
- Radius insert SG200 F R10 R1.0
- Corner radius insert C18 CR15 R1.5
- Milling insert C18 F R0.1 Ø 17.8



Contents	art.no.	€
Set of steel mountings incl. 6 inserts	<b>266005 0001</b>	<b>490,-</b>
	2151	

**ATORN® Cutting inserts for vertical thread milling work CMT**

- Type C10, from Ø 11 mm bore
- Solid carbide cutting inserts in quality grade AMT7 for all materials up to 55 HRC**
- Solid carbide cutting inserts in quality grade AMT8, extremely heat-resistant, for materials up to 62 HRC**
- For partial profile 55 and 60°, full profile ISO, UN, G55°, NPT, ACME, RD DIN405 and trapezoidal threading

**Partial profile, 60°**

- the same tool for internal and external threads

Model	Insert size mm	Pitch int. mm	Pitch int. TPI	Pitch ex. mm	Pitch ex. TPI	D mm	D min. mm	Holder	ISO <b>P M K N S H</b>	
									art.no.	€
C10 A60	C10	0.5 - 0.8	56 - 28	0.4 - 0.8	64 - 32	10	11	H1, 1.1, 2, 15, 16, 17	<b>266100</b> 1001	<b>44,30</b>
C10 G60	C10	1.0 - 2.0	28 - 13	0.8 - 1.75	32 - 15	10	12	H1, 2, 15, 17	266100 1002	<b>40,-</b>
C12 A60	C12	0.5 - 0.8	56 - 28	0.4 - 0.8	64 - 32	12	13	H3, 3.1, 4, 5, 18, 19, 20	266100 1201	<b>44,80</b>
C12 G60	C12	1.0 - 2.0	28 - 13	0.8 - 1.75	32 - 15	12.4	14	H3, 4, 5, 18, 19, 20	266100 1202	<b>40,50</b>
C18 A60	C18	0.5 - 0.8	56 - 28	0.4 - 0.8	64 - 32	17.8	19	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266100 1801	<b>51,90</b>
C18 G60	C18	1.0 - 1.75	28 - 14	0.8 - 1.5	32 - 16	17.8	20	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266100 1802	<b>47,40</b>
C18 D60	C18	2.0 - 3.0	13 - 8	1.75 - 2.5	15 - 10	17.8	21	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266100 1803	<b>47,40</b>
C25 G60	C25	1.5 - 2.5	16 - 10	1.0 - 2.0	28 - 13	25	28	H10, 11, 24, 25	266100 2501	<b>55,-</b>
C25 N60	C25	3.0 - 5.0	8 - 5	2.5 - 4.5	10 - 6	25	30	H10, 11, 24, 25	266100 2502	<b>55,-</b>
C25 Q60	C25	5.0 - 6.0	5 - 4	4.5 - 5.0	6 - 5	25	34	H10, 11, 24, 25	266100 2503	<b>55,-</b>
C12 AG60	C12	1.5 - 2.5	18 - 11	1.25 - 2.0	24 - 13	12.4	15	H3, 4, 5, 18, 20	266100 1203	<b>40,50</b>

2151

**Partial profile, 60°, multi-flute**

- the same tool for internal and external threads

Model	Insert size mm	Pitch int. mm	Pitch int. TPI	Pitch ex. mm	Pitch ex. TPI	D mm	Number of teeth	D min. mm	Holder	ISO <b>P M K N S H</b>	
										art.no.	€
S160 F AG60	S17	1.0 - 3.5	28 - 7	0.8 - 3.0	32 - 8.5	16	6	20	H3, 3.1, 4, 5, 18, 19, 20	<b>266110</b> 1701	<b>61,60</b>
S200 D N60	S20	3.0-5.0	8-5	2.5-4.5	10-6	20	4	25	H5.1, 5.2, 21	266110 2002	<b>61,60</b>
S200 F G60	S20	1.5-2.5	16-10	1.0-2.0	28-13	20	6	23	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266110 2001	<b>59,50</b>
S350 F N60	S35	3.0 - 5.0	8 - 5	2.5 - 4.5	10 - 6	35	6	38	H12, 13, 14, 26	266110 3501	<b>149,50</b>
S350 F Q60	S35	5.0 - 6.0	5 - 4	4.5 - 5.0	6 - 5	35	6	40	H12, 13, 14, 26	266110 3502	<b>149,50</b>

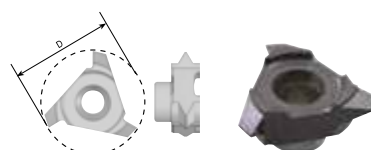
2151

**Partial profile, 55°**

- the same tool for internal and external threads

Model	Insert size mm	Pitch TPI	D mm	D min. mm	Holder	ISO <b>P M K N S H</b>	
						art.no.	€
C10 G55	C10	19-14	10.0	13	H1, 2, 15, 17	<b>266101</b> 1001	<b>40,-</b>
C12 G55	C12	28-19	12.0	14	H3, 3.1, 4, 5, 18, 19, 20	266101 1201	<b>40,50</b>
C12 N55	C12	14-11	12.2	16	H3, 4, 5, 18, 20	266101 1202	<b>40,50</b>
C18 G55	C18	14-8	18.0	23	H5.1, 5.2, 21	266101 1801	<b>47,40</b>
C25 N55	C25	7-5	25.0	31	H10, 11, 24, 25	266101 2501	<b>55,-</b>

2151



**Partial profile, 55°, BSP (G), BSF, BSW, multi-flute**

- the same tool for internal and external threads

ISO **M K N S H**

Model	Insert size mm	Pitch TPI	D mm	D min. mm	Holder	Number of teeth	AMT8 art.no.	€
S195 F G55	S20	14	19.5	23	H3, 3.1, 4, 5, 18, 19, 20	6	<b>266112 2001</b>	<b>61,60</b>
S200 D N55	S20	8-6	20.0	25	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	4	266112 2002	61,60

2151

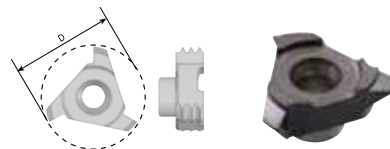
**Full profile ISO 60°**

- for female threads

ISO **M K N S H**

Model	Insert size mm	Pitch mm	D mm	D min. mm	T per cutting edge	Holder	AMT7 art.no.	€
C10 I 0.5 ISO	C10	0.5	9.0	10	6	H1, 1.1, 2, 15, 16, 17	<b>266102 1001</b>	<b>60,10</b>
C10 I 1.0 ISO	C10	1.0	10.0	12	3	H1, 1.1, 2, 15, 16, 17	266102 1002	49,80
C10 I 1.5 ISO	C10	1.5	10.0	13	2	H1, 1.1, 2, 15, 16, 17	266102 1003	49,80
C10 I 2.0 ISO	C10	2.0	10.0	14	1	H1, 2, 15, 17	266102 1004	49,80
C12 I 0.5 ISO	C12	0.5	12.0	13	6	H3, 3.1, 4, 5, 18, 19, 20	266102 1201	60,10
C12 I 0.75 ISO	C12	0.75	12.0	13	4	H3, 3.1, 4, 5, 18, 19, 20	266102 1202	55,50
C12 I 1.0 ISO	C12	1.0	12.0	14	3	H3, 3.1, 4, 5, 18, 19, 20	266102 1203	50,10
C12 I 1.5 ISO	C12	1.5	12.0	15	2	H3, 3.1, 4, 5, 18, 19, 20	266102 1204	50,10
C12 I 2.0 ISO	C12	2.0	12.4	16	1	H3, 3.1, 4, 5, 18, 19, 20	266102 1205	50,10
C12 I 2.5 ISO	C12	2.5	12.0	17	1	H3, 4, 5, 18, 20	266102 1206	50,10
C12 I 3.0 ISO	C12	3.0	12.4	17	1	H3, 4, 5, 18, 20	266102 1207	50,10
C18 I 0.5 ISO	C18	0.5	17.8	19	9	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266102 1801	69,20
C18 I 0.75 ISO	C18	0.75	17.8	19	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266102 1802	67,70
C18 I 1.0 ISO	C18	1.0	17.8	20	5	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266102 1803	62,10
C18 I 1.5 ISO	C18	1.5	17.8	20	3	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266102 1804	62,10
C18 I 2.0 ISO	C18	2.0	17.8	21	2	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266102 1805	62,10
C18 I 2.5 ISO	C18	2.5	17.8	22	2	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266102 1806	62,10
C18 I 3.0 ISO	C18	3.0	17.8	23	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266102 1807	62,10
C18 I 3.5 ISO	C18	3.5	17.8	24	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266102 1808	62,10
C25 I 3.0 ISO	C25	3.0	25.0	30	2	H10, 11, 24, 25	266102 2501	70,20
C25 I 4.0 ISO	C25	4.0	25.0	32	1	H10, 11, 24, 25	266102 2502	70,20
C25 I 4.5 ISO	C25	4.5	25.0	33	1	H10, 11, 24, 25	266102 2503	70,20
C25 I 5.0 ISO	C25	5.0	25.0	34	1	H10, 11, 24, 25	266102 2504	70,20
C25 I 5.5 ISO	C25	5.5	25.0	35	1	H10, 11, 24, 25	266102 2505	70,20
C25 I 6.0 ISO	C25	6.0	25.0	36	1	H10, 11, 24, 25	266102 2506	70,20
C10 I 1.75 ISO	C10	1.75	9.6	12	1	H1, 2, 15, 17	266102 1006	49,80
C10 I 0.75 ISO	C10	0.75	10	12	4	H1, 1.1, 2, 15, 16, 17	266102 1005	49,80
C25 I 3.5 ISO	C25	3.5	25.0	33	1	H10, 11, 24, 25	266102 2507	70,20

2151

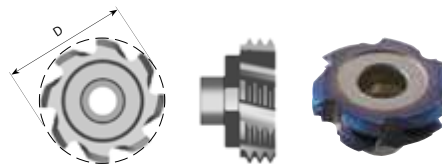
**Full profile ISO 60°, multi-flute**

- for female threads

ISO **M K N S H**

Model	Insert size mm	Pitch mm	D mm	D min. mm	T per cutting edge	Number of teeth	Holder	AMT8 art.no.	€
S 160 F 2.5 ISO	S17	2.5	16	20		1	H3, 3.1, 4, 5, 18, 19, 20	<b>266113 1701</b>	<b>81,90</b>
S163 H 1.0 ISO	S20	1.0	16.3	18	5	8	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2001	80,90
S175 H 1.5 ISO	S20	1.5	17.5	20	3	8	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2002	80,90
S178 F 2.5 ISO	S20	2.5	17.8	22	2	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2004	80,90
S186 F 2.0 ISO	S20	2.0	18.6	22	2	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2003	80,90
S189 F 3.0 ISO	S20	3.0	18.9	24	1	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2005	80,90
S200 F 3.5 ISO	S20	3.5	20.0	26	1	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2006	80,90
S200 F 4.0 ISO	S20	4.0	20.0	27	1	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2007	80,90
S200 F 4.5 ISO	S20	4.5	20.0	28	1	5	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2008	80,90
S200 F 5.0 ISO	S20	5.0	20.0	29	1	4	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266113 2009	80,90
S350 F 4.5 ISO	S35	4.5	35	45		1	H12, 13, 14, 26	266113 3501	149,50
S350 F 6.0 ISO	S35	6.0	35	64		1	H12, 13, 14, 26	266113 3502	149,50
S350 F 8.0 ISO	S35	8.0	35	130		1	H12, 13, 14, 26	266113 3503	149,50

2151



Continued on next page &gt;&gt;&gt;

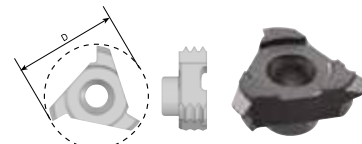
**Full profile, UN**

• for female threads

ISO **M** **K** **N** **S** **H**

Model	Insert size mm	Pitch TPI	D mm	T per cutting edge	Holder	AMT7 art.no.	€
C10 I 20 UN	C10	20	10.0	2	H1, 1.1, 2, 15, 16, 17	<b>266103 1001</b>	<b>49,80</b>
C10 I 18 UN	C10	18	10.0	2	H1, 1.1, 2, 15, 16, 17	266103 1002	<b>49,80</b>
C10 I 12 UN	C10	12	10.0	1	H1, 2, 15, 17	266103 1003	<b>49,80</b>
C12 I 32 UN	C12	32	12.0	3	H3, 3.1, 4, 5, 18, 19, 20	266103 1201	<b>55,50</b>
C12 I 28 UN	C12	28	12.0	3	H3, 3.1, 4, 5, 18, 19, 20	266103 1202	<b>50,10</b>
C12 I 24 UN	C12	24	12.0	2	H3, 3.1, 4, 5, 18, 19, 20	266103 1203	<b>50,10</b>
C12 I 20 UN	C12	20	12.0	2	H3, 3.1, 4, 5, 18, 19, 20	266103 1204	<b>50,10</b>
C12 I 18 UN	C12	18	12.0	2	H3, 3.1, 4, 5, 18, 19, 20	266103 1205	<b>50,10</b>
C12 I 16 UN	C12	16	12.0	1	H3, 3.1, 4, 5, 18, 19, 20	266103 1206	<b>50,10</b>
C12 I 11 UN	C12	11	12.0	1	H3, 4, 5, 18, 20	266103 1207	<b>50,10</b>
C12 I 10 UN	C12	10	12.0	1	H3, 4, 5, 18, 20	266103 1208	<b>50,10</b>
C18 I 32 UN	C18	32	17.8	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1801	<b>67,70</b>
C18 I 28 UN	C18	28	17.8	5	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1802	<b>62,10</b>
C18 I 24 UN	C18	24	17.8	4	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1803	<b>62,10</b>
C18 I 20 UN	C18	20	17.8	3	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1804	<b>62,10</b>
C18 I 18 UN	C18	18	17.8	3	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1805	<b>62,10</b>
C18 I 16 UN	C18	16	17.8	3	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1806	<b>62,10</b>
C18 I 14 UN	C18	14	17.8	2	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1807	<b>62,10</b>
C18 I 12 UN	C18	12	17.8	2	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1808	<b>62,10</b>
C18 I 11 UN	C18	11	17.8	2	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1809	<b>62,10</b>
C18 I 9 UN	C18	9	17.8	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1810	<b>62,10</b>
C18 I 8 UN	C18	8	17.8	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266103 1811	<b>62,10</b>
C25 I 8 UN	C25	8	25.0	2	H10, 11, 24, 25	266103 2501	<b>70,20</b>
C25 I 7 UN	C25	7	25.0	1	H10, 11, 24, 25	266103 2502	<b>70,20</b>
C25 I 6 UN	C25	6	25.0	1	H10, 11, 24, 25	266103 2503	<b>70,20</b>
C25 I 5 UN	C25	5	25.0	1	H10, 11, 24, 25	266103 2504	<b>70,20</b>
C25 I 4 UN	C25	4	25.0	1	H10, 11, 24, 25	266103 2505	<b>70,20</b>
C10 I 13 UN	C10	13	10.0	1	H1, 2, 15, 17	266103 1004	<b>49,80</b>
C12 I 12 UN	C12	12	12.4	1	H3, 3.1, 4, 5, 18, 19, 20	266103 1209	<b>50,10</b>

2151

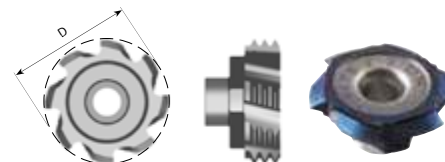
**Full profile, UN, multi-flute**

• for female threads

ISO **M** **K** **N** **S** **H**

Model	Insert size mm	Pitch TPI	D mm	Number of teeth	T per cutting edge	Holder	AMT8 art.no.	€
S150 F 10 UN	S17	10	15.0	1	1	H3, 3.1, 4, 5, 18, 19, 20	<b>266114 1701</b>	<b>81,90</b>
S160 H 24 UN	S20	24	16.0	8	4	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2001	<b>80,90</b>
S164 F 16 UN	S20	16	16.4	6	3	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2003	<b>80,90</b>
S169 H20 UN	S20	20	16.9	8	4	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2002	<b>80,90</b>
S178 F 9 UN	S20	9	17.8	6	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2006	<b>80,90</b>
S186 F 12 UN	S20	12	18.6	6	2	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2005	<b>80,90</b>
S191 F14 UN	S20	14	19.1	6	2	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2004	<b>80,90</b>
S200 D 5 UN	S20	5	20.0	4	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2010	<b>80,90</b>
S200 E 6 UN	S20	6	20.0	5	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2009	<b>80,90</b>
S200 F 7 UN	S20	7	20.0	6	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2008	<b>80,90</b>
S200 F 8 UN	S20	8	20.0	6	1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266114 2007	<b>80,90</b>
S350 F 4 UN	S35	4	35	1	1	H12, 13, 14, 26	266114 3502	<b>149,50</b>
S350 F 8 UN	S35	8	35	2	2	H12, 13, 14, 26	266114 3501	<b>149,50</b>

2151

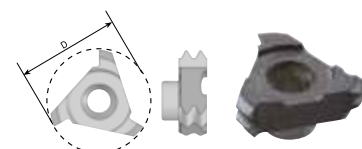
**G55° BSW, BSF, BSP**

• the same tool for internal and external threads

ISO **M** **K** **N** **S** **H**

Model	D mm	Pitch TPI	Holder	Insert size mm	T per cutting edge	AMT7 art.no.	€
C10 19 W	10.0	19	H1, 1.1, 2, 15, 16, 17	C10	2	<b>266104 1001</b>	<b>49,80</b>
C12 19 W	12.0	19	H3, 3.1, 4, 5, 18, 19, 20	C12	2	266104 1201	<b>50,10</b>
C18 14 W	17.8	14	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	C18	2	266104 1801	<b>62,10</b>
C18 11 W	17.8	11	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	C18	2	266104 1802	<b>62,10</b>

2151





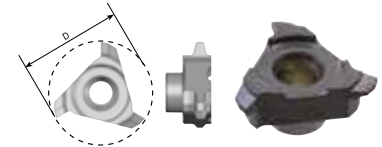
**Trapezoid**

- DIN 103
- For female threads

ISO **P M K N S H**

Model	Insert size mm	D mm	Holder	Pitch mm	AMT7 art.no.	€
C10 I 2 TR	C10	10.0	H1, 2, 15, 17	2	<b>266105</b> 1001	<b>49,80</b>
C18 I 3 TR	C18	17.8	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	3	266105 1801	<b>62,10</b>
C18 I 4 TR	C18	17.8	H5.1, 5.2, 21	4	266105 1802	<b>62,10</b>
C18 I 5 TR	C18	17.8	H5.1, 5.2, 21	5	266105 1803	<b>62,10</b>
C25 I 6 TR	C25	25.0	H10, 11, 24, 25	6	266105 2501	<b>70,20</b>
C12 I 2 TR	C12	12	H3, 4, 5, 18, 20	2	266105 1201	<b>50,60</b>

2151



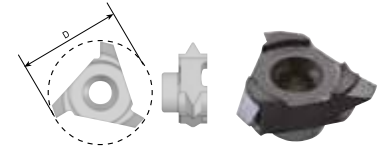
**Full profile, NPT**

**NEW**

ISO **P M K N S H**

Model	Insert size mm	Pitch TPI	D mm	Holder	AMT7 art.no.	€
C10 18 NPT	C10	18	10.0	H1, 1.1, 2, 15, 17	<b>266119</b> 1001	<b>45,80</b>
C18 14 NPT	C18	14	15.8	H5.1, 5.2, 21	266119 1801	<b>54,-</b>
C25 11,5 NPT	C25	11.5	25.0	H10, 11, 24, 25	266119 2501	<b>57,-</b>
C25 8 NPT	C25	8	25.0	H10, 11, 24, 25	266119 2502	<b>57,-</b>

2151



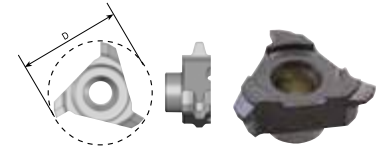
**Full profile, ACME**

**NEW**

ISO **P M K N S H**

Model	Insert size mm	Pitch TPI	D mm	Holder	AMT7 art.no.	€
C18 15 ACME	C18	5	18.0	H5.1, 5.2, 21	<b>266120</b> 1801	<b>64,60</b>
C25 14 ACME	C25	4	25.0	H10, 11, 24, 25	266120 2501	<b>72,80</b>

2151



**Full profil RD DIN405**

**NEW**

ISO **P M K N S H**

Model	Insert size mm	Pitch TPI	D mm	Holder	AMT7 art.no.	€
C18 1/6 RD	C18	6	17.8	H5.1, 5.2, 21	<b>266121</b> 1801	<b>63,10</b>
C18 1/8 RD	C18	8	17.8	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266121 1802	<b>63,10</b>
C25 1/4 RD	C25	4	25.0	H10, 11, 24, 25	266121 2501	<b>70,20</b>

2151



**ATORN® Cutting inserts for vertical milling work CMT**

- Type C10, from Ø 11 mm bore
- **Solid carbide cutting inserts in quality grade AMT7 for all materials up to 55 HRC**
- **Solid carbide cutting inserts in quality grade AMT8, extremely heat-resistant, for materials up to 62 HRC**
- For countersinking, grooving, plunge milling, face milling and finishing

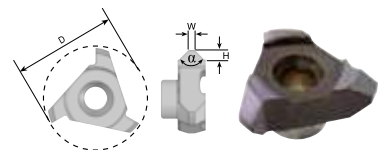
**Countersinking and grooving**

- suitable for deburring, reverse countersinking, and grooving
- Two cutting edges
- suitable for all materials

ISO **P M K N S H**

Model	Insert size mm	D mm	H mm	W mm	α °	Holder	AMT7 art.no.	€
C10 C90	C10	10.0	1.30	0.4	90	H1, 2, 15, 17	<b>266107</b> 1001	<b>37,40</b>
C12 C90	C12	12.0	1.35	0.3	90	H3, 4, 5, 18, 20	266107 1201	<b>37,90</b>
C18 C90	C18	17.8	1.95	1.1	90	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266107 1801	<b>43,-</b>
C25 C90	C25	25.0	2.50	1.0	90	H10, 11, 24, 25	266107 2501	<b>62,10</b>

2151



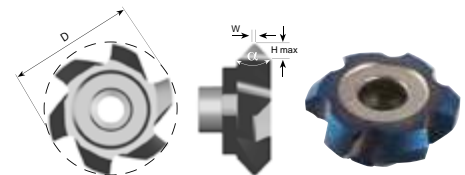
**Countersinking and grooving, multi-flute**

- suitable for deburring, reverse countersinking, and grooving
- Two cutting edges
- suitable for all materials

ISO **P M K N S H**

Model	Insert size mm	D mm	H mm	W mm	α °	Holder	Number of teeth	AMT8 art.no.	€
SC160 E H14	S17	16.0	1.35	0.2	90	H3, 3.1, 4, 5, 18, 19, 20	5	<b>266116</b> 1701	<b>56,-</b>
SC170 E H14	S20	17.0	1.35	0.2	90°	H6, 7, 8, 9, 21, 22, 23	5	266116 2001	<b>56,-</b>
SC200 F H12	S20	20.0	1.20	2.5	90°	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	6	266116 2007	<b>56,-</b>
SC200 F H14	S20	20.0	1.35	0.2	90°	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	6	266116 2002	<b>56,-</b>
SC200 F H15	S20	20.0	1.50	2.0	90°	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	6	266116 2006	<b>56,-</b>
SC200 F H17	S20	20.0	1.70	1.5	90°	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	6	266116 2005	<b>56,-</b>
SC200 F H20	S20	20.0	1.95	1.0	90°	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	6	266116 2004	<b>56,-</b>
SC200 F H24	S20	20.0	2.35	0.2	90°	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	6	266116 2003	<b>56,-</b>
SC350 F H42	S35	35.0	4.20	0.2	90	H12, 13, 14, 26	6	266116 3501	<b>135,-</b>

2151

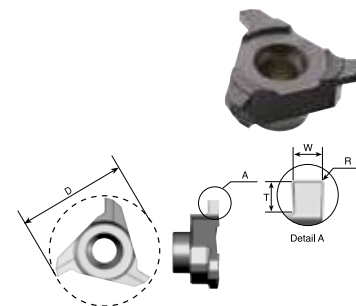


Continued on next page >>>

Plunge milling

ISO **CMKNSH**

Model	Insert size mm	D mm	W±0.02 mm	T max. mm	R mm	D min. mm	Holder	AMT7	
								art.no.	€
C10 W08	C10	10.0	0.80	0.80	0.1	10.0	H1, 1.1, 2, 15, 16, 17	266108 1001	35,60
C10 W09	C10	10.0	0.90	0.90	0.1	10.0	H1, 1.1, 2, 15, 16, 17	266108 1002	35,60
C10 W10	C10	10.0	1.00	0.90	0.1	10.0	H1, 1.1, 2, 15, 16, 17	266108 1003	35,60
C12 W08	C12	12.0	0.80	0.80	0.1	12.0	H3, 3.1, 4, 5, 18, 19, 20	266108 1201	36,30
C12 W10	C12	12.0	1.00	0.90	0.1	12.0	H3, 3.1, 4, 5, 18, 19, 20	266108 1202	36,30
C18 W10	C18	17.8	1.00	1.50	0.1	17.8	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266108 1801	43,20
C18 W12	C18	17.8	1.20	1.50	0.1	17.8	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266108 1802	43,20
C18 W15	C18	17.8	1.50	1.95	0.1	17.8	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266108 1803	43,20
C18 W20	C18	17.8	2.00	2.80	0.1	17.8	H5.1, 5.2, 21	266108 1804	43,20
C25 W20	C25	25.0	2.00	3.00	0.2	25.0	H10, 11, 24, 25	266108 2501	50,70
C25 W25	C25	25.0	2.50	3.00	0.2	25.0	H10, 11, 24, 25	266108 2502	50,70
C25 W30	C25	25.0	3.00	3.00	0.2	25.0	H10, 11, 24, 25	266108 2503	50,70
C25 W35	C25	25.0	3.50	3.50	0.2	25.0	H10, 11, 24, 25	266108 2504	50,70
C25 W40	C25	25.0	4.00	3.50	0.2	25.0	H10, 11, 24, 25	266108 2505	50,70
C25 W50	C25	25.0	5.00	3.50	0.2	25.0	H10, 11, 24, 25	266108 2506	50,70
C10 W15	C10	10	1.50	1.20	0.1	10.0	H1, 2, 15, 17	266108 1004	35,60
C10 W20	C10	10	2.00	1.20	0.1	10.0	H1, 2, 15, 17	266108 1005	35,60
C12 W10T	C12	12.3	1.00	1.60	0.2	12.3	H3, 4, 5, 18, 20	266108 1203	36,30
C12 W15	C12	12.4	1.50	1.60	0.1	12.4	H3, 4, 5, 18, 20	266108 1204	36,30
C12 W20	C12	12.4	2.00	1.60	0.1	12.4	H3, 4, 5, 18, 20	266108 1205	36,30
C12 W25	C12	12.4	2.50	1.60	0.1	12.4	H3, 4, 5, 18, 20	266108 1206	36,30

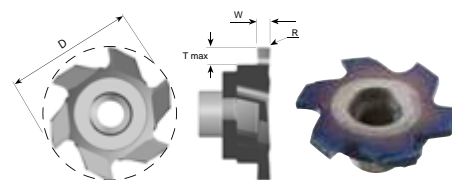


2151

Plunge milling, multi-flute

ISO **CMKNSH**

Model	Insert size mm	D mm	W±0.02 mm	T max. mm	R mm	D min. mm	Number of teeth	Holder	AMT8	
									art.no.	€
SG170 F W15	S17	17.0	1.50	2.80	0.2	17	6	H3, 3.1, 4, 5, 18, 19, 20	266117 1701	56,-
SG170 F W20	S17	17.0	2.00	2.80	0.2	17	6	H3, 3.1, 4, 5, 18, 19, 20	266117 1702	56,-
SG170 F W25	S17	17.0	2.50	2.80	0.2	17	6	H3, 3.1, 4, 5, 18, 19, 20	266117 1703	56,-
SG200 E W20T	S20	20.0	2.0	3.7	0.2	20	5	H5.1, 5.2, 21	266117 2007	58,50
SG200 E W25T	S20	20.0	2.5	3.7	0.2	20	5	H5.1, 5.2, 21	266117 2008	58,50
SG200 E W30T	S20	20.0	3.0	3.7	0.2	20	5	H5.1, 5.2, 21	266117 2009	58,50
SG200 F W15	S20	20.0	1.5	2.9	0.2	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266117 2001	56,-
SG200 F W20	S20	20.0	2.0	2.9	0.2	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266117 2002	56,-
SG200 F W25	S20	20.0	2.5	2.9	0.2	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266117 2003	56,-
SG200 F W30	S20	20.0	3.0	2.9	0.2	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266117 2004	56,-
SG200 F W40	S20	20.0	4.0	2.9	0.2	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266117 2005	56,-
SG200 F W49	S20	20.0	4.9	2.9	0.2	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266117 2006	56,-
SG350 E W30T	S35	35.0	3.00	6.30	0.2	35	6	H12, 13, 14, 26	266117 3501	149,50
SG350 E W40T	S35	35.0	4.00	6.30	0.2	35	6	H12, 13, 14, 26	266117 3502	149,50
SG350 E W50T	S35	35.0	5.00	6.30	0.2	35	6	H12, 13, 14, 26	266117 3503	135,-
SG350 E W60T	S35	35.0	6.00	6.30	0.2	35	6	H12, 13, 14, 26	266117 3504	135,-
SG350 E W80T	S35	35.0	8.00	6.30	0.2	35	6	H12, 13, 14, 26	266117 3505	135,-

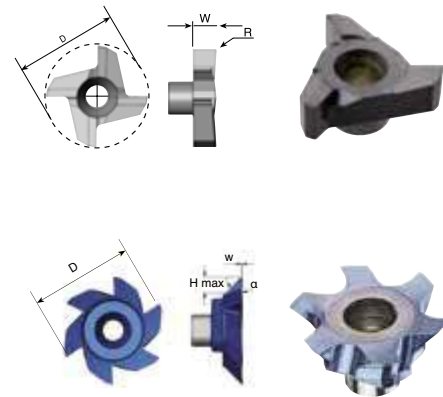


2151

Face milling and finishing

ISO **CMKNSH**

Model	Insert size mm	D mm	W mm	R mm	Holder	AMT7	
						art.no.	€
C10 F R0.1	C10	10.0		0.1	H1, 1.1, 2, 15, 16, 17	266109 1001	46,60
C12 F R0.1	C12	12.0		0.1	H3, 3.1, 4, 5, 18, 19, 20	266109 1201	47,40
C18 F R 0.1	C18	17.8	5.0	0.1	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266109 1801	55,-
C25 F R 0.2	C25	25.0	6.0	0.2	H10, 11, 24, 25	266109 2501	62,60



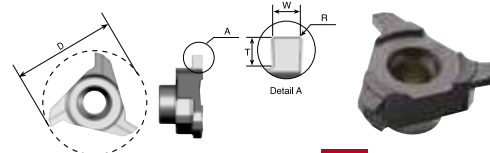
2151

angle milling 45°

NEW ISO **CMKNSH**

Model	Insert size mm	D mm	H mm	W mm	α °	Number of teeth	Holder	AMT8	
								art.no.	€
SC170 F A45	S17	17.0	2.5	0.1	45	6	H3, 3.1, 4, 5, 18, 19, 20	266122 1701	57,-
SC200 F A45	S20	20.0	3.0	0.1	45	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266122 2001	57,-

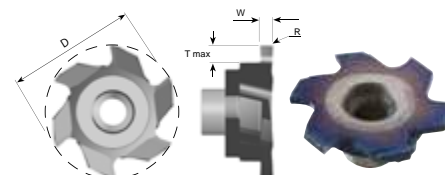
2151

**Circlip plunge milling**

NEW ISO P M K N S H

Model	Insert size mm	D mm	W mm	T max. mm	R mm	D min. mm	Holder	AMT7	
								art.no.	€
C10 W087	C10	10.0	0.87	1.3	0	10.0	H1, 2, 15, 17	266123 1001	39,60
C10 W097	C10	10.0	0.97	1.3	0	10.0	H1, 2, 15, 17	266123 1002	39,60
C10 W121	C10	10.0	1.21	1.3	0	10.0	H1, 2, 15, 17	266123 1003	39,60
C10 W141	C10	10.0	1.41	1.3	0.1	10.0	H1, 2, 15, 17	266123 1004	39,60
C10 W171	C10	10.0	1.71	1.3	0.1	10.0	H1, 2, 15, 17	266123 1005	39,60
C12 W121	C12	12.4	1.21	1.7	0	12.4	H3, 4, 5, 18, 20	266123 1201	40,-
C12 W141	C12	12.4	1.41	1.7	0.1	12.4	H3, 4, 5, 18, 20	266123 1202	40,-
C12 W171	C12	12.4	1.71	1.7	0.1	12.4	H3, 4, 5, 18, 20	266123 1203	40,-
C18 W121	C18	17.8	1.21	2.9	0.1	17.8	H5.1, 5.2, 21	266123 1801	47,80
C18 W141	C18	17.8	1.41	2.9	0.1	17.8	H5.1, 5.2, 21	266123 1802	47,80
C18 W171	C18	17.8	1.71	2.9	0.1	17.8	H5.1, 5.2, 21	266123 1803	47,80
C18 W196	C18	17.8	1.96	2.9	0.15	17.8	H5.1, 5.2, 21	266123 1804	47,80

2151

**Circlip plunge milling, multi-flute**

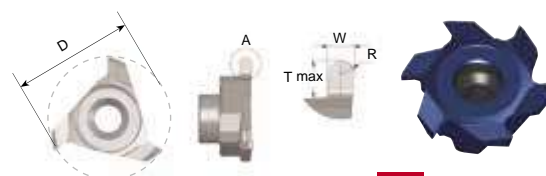
ISO P M K N S H

Model	Insert size mm	D mm	W mm	t max. mm	R mm	D min. mm	Number of teeth	Holder	AMT8	
									art.no.	€
SG200 F W 196	S20	20.0	1.96	4.0	0.1	20.0	6	H5.1, 5.2, 21	266124 2004	61,60
SG200 F W121	S20	20.0	1.21	4.0	0	20.0	6	H5.1, 5.2, 21	266124 2001	61,60
SG200 F W141	S20	20.0	1.41	4.0	0.1	20.0	6	H5.1, 5.2, 21	266124 2002	61,60
SG200 F W171	S20	20.0	1.71	4.0	0.1	20.0	6	H5.1, 5.2, 21	266124 2003	61,60

2151

**ATORN® Cutting inserts for vertical radius milling work CMT**

- Type C10, from Ø 11 mm bore
- **Solid carbide cutting inserts in quality grade AMT7 for all materials up to 55 HRC**
- **Solid carbide cutting inserts in quality grade AMT8, extremely heat-resistant, for materials up to 62 HRC**
- For partial radius and full radius plunge milling

**Full radius plunge milling**

NEW ISO P M K N S H

Model	Insert size mm	D mm	W±0.02 mm	R mm	t max. mm	D min. mm	Holder	AMT7	
								art.no.	€
C12 R11	C12	12.4	2.2	1.1	1.7	12.4	H3, 4, 5, 18, 20	266125 1201	39,60
C18 R08	C18	17.8	1.6	0.8	2.9	17.8	H5.1, 5.2, 21	266125 1801	46,60

2151

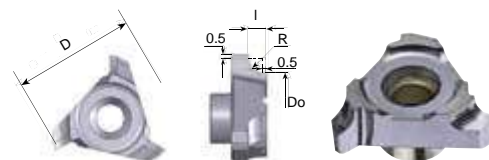
**Full radius plunge milling, multi-flute**

ISO P M K N S H

Model	Insert size mm	D mm	W±0.02 mm	T max. mm	R mm	D min. mm	Number of teeth	Holder	AMT8	
									art.no.	€
SG200 F R10	S20	20.0	2.0	2.9	1.0	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266118 2001	58,50
SG200 F R12	S20	20.0	2.4	2.9	1.2	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266118 2002	58,50
SG200 F R15	S20	20.0	3.0	2.9	1.5	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266118 2003	58,50
SG200 F R20	S20	20.0	4.0	2.9	2.0	20	6	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266118 2004	58,50

2151

Continued on next page &gt;&gt;&gt;

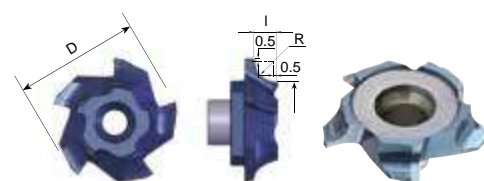


### One-sided partial radius plunge milling

NEW ISO P M K N S H

Model	Insert size mm	D mm	D min. mm	Holder	I mm	R mm	AMT7	
							art.no.	€
C10 CR05	C10	10	10.5	H1, 1.1, 2, 15, 16, 17	1.05	0.5	266126 1001	37,60
C10 CR10	C10	10.0	10.5	H1, 1.1, 2, 15, 16, 17	1.55	1.0	266126 1002	37,60
C18 CR13	C18	18	18	H5, 5.2, 6, 7, 8, 9, 21, 22, 23	1.80	1.25	266126 1801	45,30
C18 CR15	C18	18	18	H5, 5.2, 6, 7, 8, 9, 21, 22, 23	2.05	1.5	266126 1802	45,30
C18 CR20	C18	18	18	H5, 5.2, 6, 7, 8, 9, 21, 22, 23	2.55	2.0	266126 1803	45,30
C25 CR30	C25	25	25	H10, 11, 24, 25	3.60	3.0	266126 2501	53,40

2151

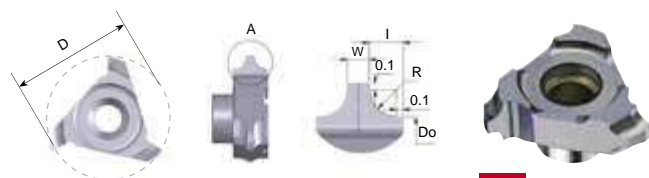


### One-sided partial radius plunge milling, multi-flute

NEW ISO P M K N S H

Model	Insert size mm	D mm	D min. mm	Holder	I mm	R mm	Number of teeth	AMT8	
								art.no.	€
S170 E CR10	S17	17.0	17	H3, 3.1, 4, 5, 18, 19, 20	1.55	1.0	5	266127 1701	59,50
S170 E CR13	S17	17.0	17	H3, 3.1, 4, 5, 18, 19, 20	1.80	1.25	5	266127 1702	59,50
S170 E CR15	S17	17.0	17	H3, 3.1, 4, 5, 18, 19, 20	2.05	1.5	5	266127 1703	59,50

2151

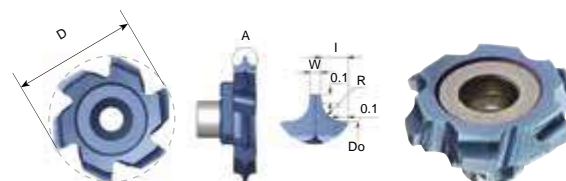


### Double-sided partial radius plunge milling

NEW ISO P M K N S H

Model	Insert size mm	D mm	D min. mm	Holder	R mm	W mm	AMT7	
							art.no.	€
C10 CRD08	C10	10.0	10	H1, 1.1, 2, 15, 16, 17	0.8	1.2	266128 1001	41,20
C18 CRD15	C18	17.8	18	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	1.5	1.8	266128 1801	49,90
C25 CRD20	C25	25.0	25	H10, 11, 24, 25	2.0	2.0	266128 2501	59,-

2151






### Double-sided partial radius plunge milling, multi-flute






NEW ISO P M K N S H


Model	Insert size mm	D mm	D min. mm	Holder	R mm	W mm	Number of teeth	AMT8	
								art.no.	€
S170 F CRD08	S17	17.0	17	H3, 3.3, 4, 5, 18, 19, 20	0.8	1.2	6	266129 1701	65,10
S200 F CDR15	C25	20.0	20	H5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	1.5	1.8	6	266129 2001	65,10








2151








## Overview of tool holders


	Exchangeable head milling cutters	Face milling cutters			
Sorting by type					
Brand	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>
ISO	<b>P M K N H</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N H</b>
Order No.	255500-504.... 255600-615....	260801.... 260202....	262555....	260200....	262550....
Tool cutting edge angle	Various	45°	45°	45°	45°
Number of cutting edges	2 - 8	2-16	4-20	4-13	4-16
Coolant bore		●	●	●	●
ISO milling inserts		SET 1204	SN.X 1206 SNMU 1206	SE.N 1203	SET 13T3 XEHW 13T3
Page	<b>637</b>	<b>646</b>	<b>647</b>	<b>650</b>	<b>652</b>

	Face milling cutters			Drilling/die sinking cutters	
Sorting by type					
Brand	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>
ISO	<b>P M K</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>
Order No.	260111....	265232....	262533....	262515.... 262516....	262515.... 262516....
Tool cutting edge angle		75°	75°	90°	90°
Number of cutting edges	4 - 8	4	3 - 7	3	3
Coolant bore				●	●
ISO milling inserts	OCKX 1606 XCKX 1606 RCKX 1606 SAHT 1306	APKT 1003 APHX 1003	APKT 1604 APHX 1604	APKT 1003 APHX 1003	APKT 1604 APHX 1604
Page	<b>651</b>	<b>662</b>	<b>668</b>	<b>660</b>	<b>667</b>

	Shoulder milling cutters						
Sorting by type							
Brand	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>
ISO	<b>P M K N</b>	<b>P M K S</b>	<b>P M K</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K</b>
Order No.	Various	262547....	262535....	262540.... 262542.... 262546....	262559.... 262561.... 262563....	262523.... 262525.... 262530....	262537....
Tool cutting edge angle	89.5	90°	90°	90°	90°	90°	90°
Number of cutting edges	1-9	4-9	8 - 11	1-12	3-10	4-16	8 - 30
Coolant bore	●	●	●	●		●	●
ISO milling inserts	SPMT 06.. SPMT 12.. SPGT 06.. SPGT 12..	SDMT 1205	APKT 06	AP.. 1003	LN.X 100605	APKT 1604 APHX 1604	APKT 06
Page	<b>674</b>	<b>654</b>	<b>655</b>	<b>659</b>	<b>672</b>	<b>668</b>	<b>655</b>

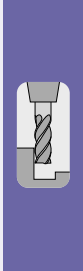
	Shoulder milling cutters			Roughing spiral flute milling cutters		Spiral flute chamfer milling cutters	
Sorting by type							
Brand	<b>ATORN®</b>	<b>ATORN®</b>	<b>palbit®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>
ISO	<b>P M K</b>	<b>P M K</b>	<b>P M K N H</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>
Order No.	262568....	262565....	260293.... 260294.... 260295....	262529.... 262544....	262523....	262531....	262527....
Tool cutting edge angle	90°	90°	95°	90°	90°	15 - 75°	15 - 75°
Number of cutting edges	4 - 8	5 - 11	2 - 7	1 - 4	3 - 6	9	6
Coolant bore	●	●	●	●		●	
ISO milling inserts	WNEU 04	WNEU 08	XD.. 04.. XD.. 06.. XD.. 08..	APKT 1003 APHX 1003	APKT 1604 APHX 1604	APKT 1003 APHX 1003	APKT 1604 APHX 1604
Page	<b>677</b>	<b>678</b>	<b>704</b>	<b>661</b>	<b>685</b>	<b>661</b>	<b>669</b>

	Countersinking mill, adjustable		Chamfer cutters		High-speed corner milling cutters		
Sorting by type							
Brand	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>
ISO	<b>P M K S</b>	<b>P M K S</b>	<b>P M K S</b>	<b>P M K S</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>
Order No.	260123....	260123....	260121.... 260125....	260126....	264001.... 264002....	264003.... 264004....	264006.... 264007.... 264009....
Tool cutting edge angle	10 - 80°	10 - 80°	30 - 45 - 60°	45°	90°	90°	90°
Number of cutting edges	1	1	1-3	1	1 - 6	2 - 6	2 - 9
Coolant bore				●	●	●	●
ISO milling inserts	TC.. 1102	TC.. 16T3 SCMT 1204	TCMT 1102 TCMT 16T3 SCMT 0602 SCMT 09T3	TCMT 16T3	AD..X 06..	AD..X 09..	AD..X 12..
Page	<b>718</b>	<b>718</b>	<b>721</b>	<b>724</b>	<b>682</b>	<b>683</b>	<b>684</b>

	High-speed corner milling cutters	High-speed spiral flute milling cutters				T-slot milling cutters	Plunge milling cutters
Sorting by type							
Brand	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>SARA®</b>	<b>ATORN®</b>	
ISO	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K N</b>	<b>P M K</b>	<b>N</b>	
Order No.	264011.... 264012.... 264014....	264005....	264008.... 264010....	264013....	263007....	260400.... 260402....	
Tool cutting edge angle	90°	90°	90°	90°		90°	
Number of cutting edges	2 - 9	6 - 15	8 - 20	12 - 20	2 - 4	2 - 5	
Coolant bore	●	●	●	●	●	●	
ISO milling inserts	AD..X 17..	AD..X 09..	AD..X 12..	AD..X 17..	SPMT 0603 SPMT 09T3 SPMT 1204	VCPT 220530 VPGT 160412	
Page	<b>681</b>	<b>683</b>	<b>685</b>	<b>687</b>	<b>725</b>	<b>707</b>	

	Plunge milling cutters	High feed-rate milling cutters					Copy milling cutters
Sorting by type							
Brand	palbit	ATORN	palbit	palbit	palbit	palbit	palbit
ISO	N	P M K N	P M K S	P M K S	P M K N	P M K S	P K H
Order No.	260252... 260253... 260250... 260251...	Various	260218... 260219...	260220... 260221...	260239... 260243...	260312... 260313...	260289... 260290... 260281... 260884... 260817...
Tool cutting edge angle	90°		10°	10°	90°		
Number of cutting edges	3 - 6	2 - 10	2 - 5	3 - 8	2 - 9	2 - 9	2 - 7
Coolant bore	●	●	●	●	●	●	●
ISO milling inserts	XDGX 15...	XCNT/W 07 XCNT/W 09 XCNT/W 12 XDM 09	SOE...08	SOE...13	XP 06... XP 10... XP 17...	XNMU06...	RD.. 07.. RD.. 10.. RD.. 12.. RD.. 16..
Page	706	691	695	696	697	703	708

	Ball-nose cutter	Torus cutter	High feed-rate milling cutters	Tangential milling cutter	Disc milling cutters	
Sorting by type						
Brand	palbit	ATORN	palbit	ATORN	ATORN	SARA
ISO	P M K S N H	P M K S N H	P M K	P M K	P M K N	P M K N
Order No.	260530.... - 260534....	260540.... 260544....	260247.... 260248....	262566....	262600.... 262610....	262630....
Tool cutting edge angle			90°	90°		
Number of cutting edges	1	1	2 - 11	5 - 20	8 - 24	4 - 10
Coolant bore			●			
ISO milling inserts	PFB	PFR	LNXT13	XNMU	SNHX 110.T SNHX 120.T	GELCG...19
Page	712	715	680	679	735	737





TOOL

**WORN-OUT.**

THAT WON'T

**STOP YOU**

**BECAUSE YOU ARE ALWAYS PREPARED:  
SARA® GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

**Reduced costs**

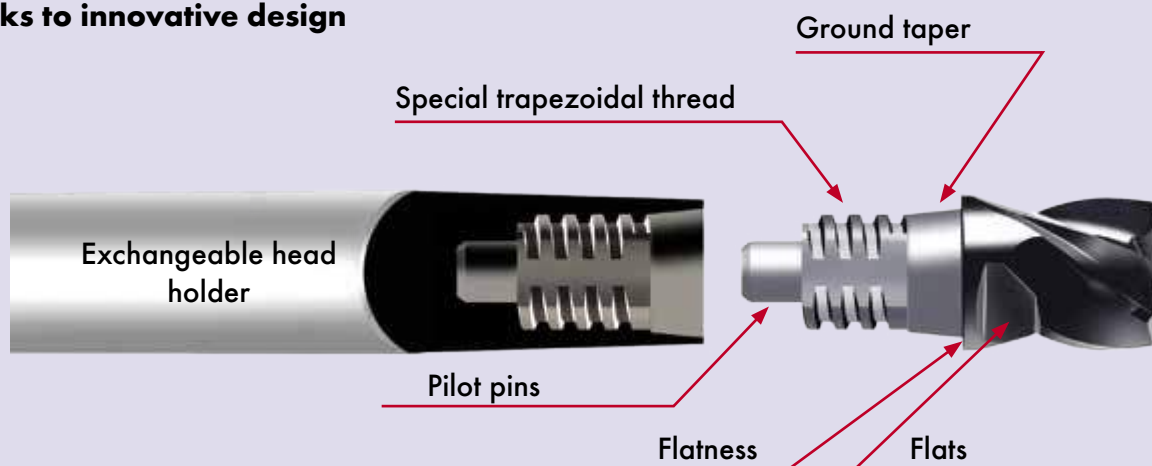
### Properties

- Low tooling times
- A wide range of geometries
- Various shank shapes
- Diameters from 10 to 20 mm

### Advantages

- High true-running accuracy <math>< 20\mu\text{m}</math>
- High stability and stiffness thanks to pilot pins
- Low-vibration
- Guaranteed repetition precision

### Perfect friction and form fit thanks to innovative design



### A modular system for a wide range of tasks

- For ISO material groups P, M, N, K, H
- For roughing and finishing all contours
- Optimal for series production
- Particularly suitable for multiple-spindle automated lathes without tool changer and lathes with driven tools

### Cost advantages

- Replacement of the head, shank remains clamped
- Up to 50 change cycles per shank possible
- Replaceable heads can be resharpened
- Quick change
- Reduced auxiliary processing times



## Modular milling system

								
Brand	ATORN®							
ISO	P M K N	P M K N	P N	P M K	P M K	P M K	P M K	P M K
Number of cutting edges	2	3	3	4	4	6-8	4-6	4-5
Diameter range / mm	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
Standard	WN	WN	WN	WN	WN	WN	WN	WN
Version			HPC		HPC		MTC	MTC
Type/profile	N	N	W	N	NH	N	NRF	NR
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN	Zn	TiAlN	AlTiN	TiAlN	AlTiN	AlTiN
Item number	255604...	255605...	255603...	255606...	255600	255607	255601	255602
Page	640	640	641	641	641	642	643	643

								
Brand	ATORN®							
ISO	P K H	P K H	P K H	P K H	P K H	P M K N	P M K N	P M K N
Number of cutting edges	4	2	2	2	4	2	6	4
Diameter range / mm	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
Standard	WN	WN	WN	WN	WN	WN	WN	WN
Version	HPC/HSC	HPC	HPC/HSC	HSC				
Type/profile	N	NH	H	H	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlTiN+	AlTiN	AlTiN+	AlTiN	TiAlN	TiAlN	TiAlN	TiAlN
Item number	255608	255609	255610	255612	255611	255613	255614	255615
Page	644	644	644	645	645	645	646	646

Over 200,000 tools available online!

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

[www.saratools.com](http://www.saratools.com)

**ATORN® Straight exchangeable head holder**

- Please order chuck key separately

**Steel holder, short**

D mm	L mm	L1 mm	D1 mm	MD	art.no.	€
10	65	5	9.6	20	<b>255500</b> 0020	<b>99,70</b>
12	75	5	11.6	30	255500 0030	<b>99,70</b>
16	80	6	15.4	40	255500 0040	<b>114,-</b>
20	90	6	19.2	50	255500 0050	<b>114,-</b>

2159

**Steel holder, long**

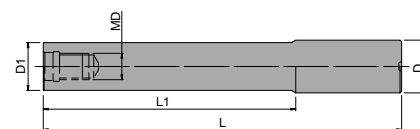
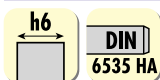
D mm	L mm	L1 mm	D1 mm	MD	art.no.	€
10	75	18	9.6	20	<b>255501</b> 0020	<b>114,-</b>
12	85	21	11.6	30	255501 0030	<b>114,-</b>
16	95	23	15.4	40	255501 0040	<b>126,50</b>
20	110	28	19.2	50	255501 0050	<b>128,50</b>

2159

**Solid carbide holder, extra-long**

D mm	L mm	L1 mm	D1 mm	MD	art.no.	€
10	111	56	9.6	20	<b>255502</b> 0020	<b>253,-</b>
12	128	63	11.6	30	255502 0030	<b>267,-</b>
16	149	79	15.4	40	255502 0040	<b>355,-</b>
20	174	94	19.2	50	255502 0050	<b>480,-</b>

2159

**ATORN® Tapered exchangeable head holder**

- Please order chuck key separately

**Steel holder 5°**

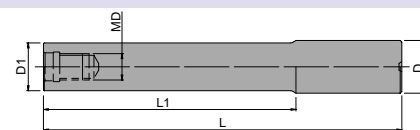
D mm	L mm	L1 mm	D1 mm	MD	art.no.	€
16	105	36	9.6	20	<b>255503</b> 0020	<b>136,50</b>
20	120	48	11.6	30	255503 0030	<b>136,50</b>
20	135	26	15.4	40	255503 0040	<b>138,50</b>
25	150	33	19.2	50	255503 0050	<b>144,50</b>

2159

**Steel holder 1°**

D mm	L mm	L1 mm	D1 mm	MD	art.no.	€
16	110	36	9.6	20	<b>255504</b> 0020	<b>136,50</b>
20	130	53	11.6	30	255504 0030	<b>136,50</b>
20	145	59	15.4	40	255504 0040	<b>138,50</b>
25	180	74	19.2	50	255504 0050	<b>144,50</b>

2159

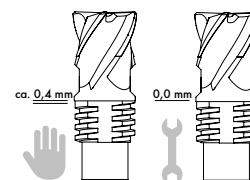
**ATORN® Assembly key for exchangeable head holder**

MD	Wr. width mm	L mm	h mm	art.no.	€
20	8 mm	92	2.8	<b>255698</b> 0020	<b>7,35</b>
30	10 mm	100	3.8	255698 0030	<b>7,95</b>
40	13 mm	135	3.8	255698 0040	<b>9,60</b>
50	16 mm	145	4.8	255698 0050	<b>11,-</b>

2161



Initial tightening by hand,  
then using specified torque



## ATORN® Open-end snap-in spanner for exchangeable head holder

MD	Wr. width mm	h mm	Quadratic mm	art.no.	€
20	8	2.8	9x12	255699 0020	76,30
30	10	3.8	9x12	255699 0030	76,30
40	13	3.8	9x12	255699 0040	76,30
50	16	4.8	9x12	255699 0050	76,30

2161



### For snap-in tools

- Accuracy ± 3 % of scale value
- Including serial number and certificate
- DIN EN ISO 6789:2003 (D)



For snap-in tools, please visit the online shop

Torque N-m	Quadratic mm	Scale division N-m	L mm	art.no.	€
10-60	9x12	0.5	312	702603 0002	148,50

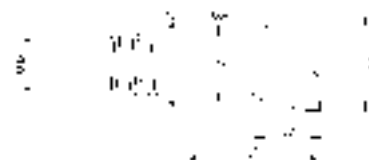
7109



702603 0002

## ATORN® Exchangeable head milling cutter, Z2

VHM Typ N h10 h6 Z 2 TiAlN 812



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●		●		●	●				●	●	●					
		220	190	155		120		180	140				300	220	200					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

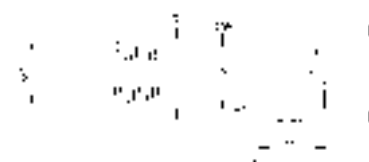
D mm	L2 mm	L1 mm	D1 mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	20	12	0.084	255604 0100	55,-
12	9	17	11.6	10 x 4 mm	30	15	0.084	255604 0120	70,20
16	12	21	15.4	13 x 4 mm	40	30	0.11	255604 0160	99,70
20	15	26	19.2	16 x 5 mm	50	45	0.14	255604 0200	122,50

2160



## ATORN® Exchangeable head milling cutter, Z3 Type N

VHM Typ N h10 h6 Z 3 TiAlN 812



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel				
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●		●		●	●				●	●	●					
		220	190	155		120		180	140				250	300	200					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L2 mm	L1 mm	D1 mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	20	12	0.084	255605 0100	55,-
12	9	17	11.6	10 x 4 mm	30	15	0.084	255605 0120	70,20
16	12	21	15.4	13 x 4 mm	40	30	0.11	255605 0160	99,70
20	15	26	19.2	16 x 5 mm	50	45	0.14	255605 0200	122,50

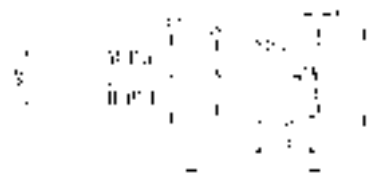
2160





## ATORN® Exchangeable head milling cutter, Z3 Type W

VHM Typ W 45° h10 h6 Z3 ZrN HPC Vc/fz 811



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
													●	●	●					
		Cutting speed Vc m/min.			Please adjust these guidelines according to clamping operation and machine set-up.															

D mm	L2 mm	L1 mm	D1 mm	F x 45° mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
10	7	14	9.6	0.20	8 x 3 mm	20	12	0.065	255603 0100	55,-
12	9	17	11.6	0.20	10 x 4 mm	30	15	0.065	255603 0120	68,20
16	12	21	15.4	0.20	13 x 4 mm	40	30	0.085	255603 0160	101,-
20	15	26	19.2	0.20	16 x 5 mm	50	45	0.11	255603 0200	130,50

2160



## ATORN® Exchangeable head milling cutter, Z4

VHM Typ N 45° h10 h6 Z4 TiAlN Vc/fz 812



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●		●		●	●				●	●						
		Cutting speed Vc m/min.			Please adjust these guidelines according to clamping operation and machine set-up.															

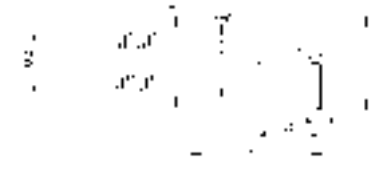
D mm	L2 mm	L1 mm	D1 mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	20	12	0.084	255606 0100	55,-
12	9	17	11.6	10 x 4 mm	30	15	0.084	255606 0120	70,20
16	12	21	15.4	13 x 4 mm	40	30	0.11	255606 0160	99,70
20	15	26	19.2	16 x 5 mm	50	45	0.14	255606 0200	122,50

2160



## ATORN® Exchangeable head milling cutter, Z4 irregular

VHM NH 35°-38° h10 h6 Z4 AlTiN HPC Vc/fz 811



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●		●		●	●											
		Cutting speed Vc m/min.			Please adjust these guidelines according to clamping operation and machine set-up.															

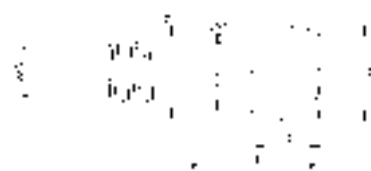
D mm	L2 mm	L1 mm	D1 mm	F x 45° mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	0.3	8 x 3 mm	20	12	0.075	255600 0100	65,10
12	9	17	11.6	0.3	10 x 4 mm	30	15	0.075	255600 0120	79,40
16	12	21	15.4	0.4	13 x 4 mm	40	30	0.1	255600 0160	128,50
20	15	26	19.2	0.5	16 x 5 mm	50	45	0.12	255600 0200	146,50

2160



## ATORN® Exchangeable head milling cutter, multi-flute

VHM Typ N Z 6 Z 8+ TiAlN 812



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		220	160	90		120		200	170											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L2 mm	L1 mm	D1 mm	Z	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	6	8 x 3 mm	20	12	0.065	255607 0100	63,10
12	9	17	11.6	6	10 x 4 mm	30	15	0.065	255607 0120	81,40
16	12	21	15.4	6	13 x 4 mm	40	30	0.075	255607 0160	124,50
20	15	26	19.2	8	16 x 5 mm	50	45	0.1	255607 0200	165,-

2160



## ATORN® Exchangeable head roughing cutter NR

VHM NRF NR Z 4 Z 5 Z 6 AlTiN MTC 811

material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	<700 N/mm²	<1000 N/mm²	<1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		<30 HRc	≥30 HRc	<8 % Si	≥8 % Si	Cu-alloy	GRP/CFP/thermo.	<55 HRc	<60 HRc	≥60 HRc	
		190	150	110		90		170	120											

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### NRF - tothing

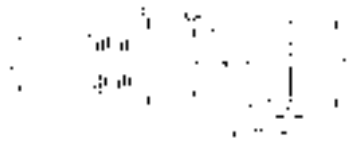
D mm	L2 mm	L1 mm	D1 mm	F x 45° mm	Z	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	0.20	4	8 x 3 mm	20	12	0.052	255601 0100	59,-
12	9	17	11.6	0.20	4	10 x 4 mm	30	15	0.052	255601 0120	75,30
16	12	21	15.4	0.25	5	13 x 4 mm	40	30	0.07	255601 0160	114,-
20	15	26	19.2	0.25	6	16 x 5 mm	50	45	0.084	255601 0200	146,50

2160

### NR - tothing

D mm	L2 mm	L1 mm	D1 mm	Z	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	Type	art.no.	€
10	7	14	9.6	4	8 x 3 mm	20	12	0.052	NR	255602 0100	59,-
12	9	17	11.6	4	10 x 4 mm	30	15	0.052	NR	255602 0120	75,30
16	12	21	15.4	5	13 x 4 mm	40	30	0.07	NR	255602 0160	114,-
20	15	26	19.2	5	16 x 5 mm	50	45	0.084	NR	255602 0200	146,50

2160





## ATORN® Exchangeable head torus milling cutter

VHM Typ H NH 45° 15° h10 h6 Z 4 Z 2 AITiN+ AITiN HPC HSC Vc/fz 813

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
255608....	●	●	●	●				●	●								●	●	●
		194-355	181-330	137-320				178-325	162-295								107-195	60-110	52-95
255609....	●	●	●	●				●	●								●	●	●
		200	140	120				180	150								95	70	60

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

### Type H (HPC/HSC) 45°

• For dry machining

D	L2	L1	D1	R	Z	Wr. width	MD	Tightening torque max.	Feed fz	Feed fz	AITiN+	€
mm	mm	mm	mm	mm	mm	mm		N·m	steel < 1000 N/mm²	steel < 1000 N/mm²	art.no.	
10	7	14	9.6	0.5	4	8 x 3 mm	20	12	0.074	0.1	255608 1005	66,20
10	7	14	9.6	1.0	4	8 x 3 mm	20	12	0.074	0.1	255608 1010	66,20
10	7	14	9.6	1.5	4	8 x 3 mm	20	12	0.074	0.1	255608 1015	66,20
10	7	14	9.6	2.0	4	8 x 3 mm	20	12	0.074	0.1	255608 1020	66,20
12	9	17	11.6	0.5	4	10 x 4 mm	30	15	0.074	0.1	255608 1205	82,40
12	9	17	11.6	1.0	4	10 x 4 mm	30	15	0.074	0.1	255608 1210	82,40
12	9	17	11.6	1.5	4	10 x 4 mm	30	15	0.074	0.1	255608 1215	82,40
12	9	17	11.6	2.0	4	10 x 4 mm	30	15	0.074	0.1	255608 1220	82,40
16	12	21	15.4	1.0	4	13 x 4 mm	40	30	0.089	0.12	255608 1605	130,50
16	12	21	15.4	1.5	4	13 x 4 mm	40	30	0.089	0.12	255608 1610	130,50
16	12	21	15.4	2.0	4	13 x 4 mm	40	30	0.089	0.12	255608 1615	130,50
16	12	21	15.4	3.0	4	13 x 4 mm	40	30	0.089	0.12	255608 1620	130,50
20	15	26	19.2	1.0	4	16 x 5 mm	50	45	0.111	0.15	255608 2010	148,50

2160

### Type H-N (HSC) 15°

D	L2	L1	D1	R	Z	Wr. width	MD	Tightening torque max.	ERtheor.	Feed fz	AITiN	€
mm	mm	mm	mm	mm	mm	mm		N·m	mm	steel < 1000 N/mm²	art.no.	
10	7	14	9.6	0.64	2	8 x 3 mm	20	12	0.90	0.2	255609 0100	55,-
12	9	17	11.6	0.75	2	10 x 4 mm	30	15	1.10	0.2	255609 0120	70,20
16	12	21	15.4	1.06	2	13 x 4 mm	40	30	1.45	0.25	255609 0160	101,50
20	15	26	19.2	1.25	2	16 x 5 mm	50	45	1.65	0.3	255609 0200	120,50

2160



## ATORN® Exchangeable head radius milling cutter, Type H Z2

VHM Typ H 30° h10 h6 Z 2 AITiN+ HPC HSC Vc/fz 814

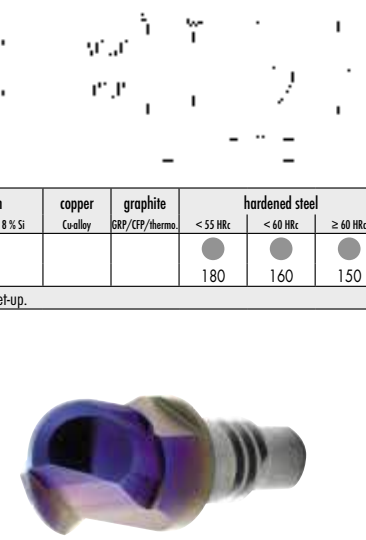
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based	aluminium		copper	graphite	hardened steel			
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	●	●	●	●				○	○								●	●	●
		570	350	240				400	380								180	160	150

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

30°

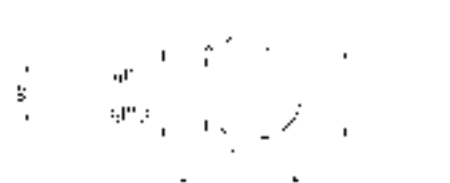
D	L2	L1	D1	R	Wr. width	MD	Tightening torque max.	Feed fz	AITiN+	€
mm	mm	mm	mm	mm	mm		N·m	steel < 1000 N/mm²	art.no.	
10	7	14	9.6	5	8 x 3 mm	20	12	0.065	255610 0100	55,-
12	9	17	11.6	6	10 x 4 mm	30	15	0.065	255610 0120	68,20
16	12	21	15.4	8	13 x 4 mm	40	30	0.09	255610 0160	104,-
20	15	26	19.2	10	16 x 5 mm	50	45	0.12	255610 0200	130,50

2160



## ATORN® Exchangeable head radius milling cutter, Type H Z2 220°

VHM NH Z 2 AITiN HSC 815



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●								●	●	●
		450	310	170				450	410								120	90	70

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

15°

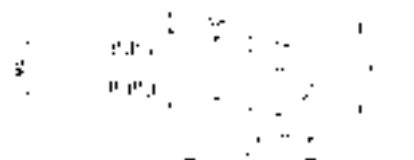
D mm	L2 mm	L1 mm	D1 mm	R mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	AITiN art.no.	€
10	7	14	9.6	5	8 x 3 mm	20	12	0.065	255612 0100	63,10
12	9	17	11.6	6	10 x 4 mm	30	15	0.065	255612 0120	77,30
16	12	21	15.4	8	13 x 4 mm	40	30	0.09	255612 0160	116,-
20	15	26	19.2	10	16 x 5 mm	50	45	0.1	255612 0200	146,50

2160



## ATORN® Exchangeable head radius milling cutter, Type N

VHM Typ N Z 4 TiAlN 814



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●				●	●								●		
		570	350	200				550	500								130		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

30°

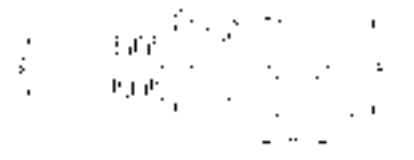
D mm	L2 mm	L1 mm	D1 mm	R mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	5	8 x 3 mm	20	12	0.065	255611 0100	61,10
12	9	17	11.6	6	10 x 4 mm	30	15	0.065	255611 0120	75,30
16	12	21	15.4	8	13 x 4 mm	40	30	0.09	255611 0160	114,-
20	15	26	19.2	10	16 x 5 mm	50	45	0.12	255611 0200	144,50

2160



## ATORN® Exchangeable head milling cutter, multimill

VHM Typ N Z 2 TiAlN 815



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●		●	●				●	●	●				
		120	90	65	80	80		120	90				300	280	200				



Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L2 mm	L1 mm	D1 mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	20	12	0.045	255613 0100	46,40
12	9	17	11.6	10 x 4 mm	30	15	0.065	255613 0120	60,10
16	12	21	15.4	13 x 4 mm	40	30	0.08	255613 0160	90,60
20	15	26	19.2	16 x 5 mm	50	45	0.09	255613 0200	108,-

2160



## ATORN® Exchangeable head deburring milling cutter

VHM Typ N 90° h10 h6 Z 6 TiAlN   815



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	●	●		●	●				●	●	●					
		190	120	160	75	110		150	100				700	500	300					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L2 mm	L1 mm	D1 mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	20	12	0.044	<b>255614 0100</b>	46,40
12	9	17	11.6	10 x 4 mm	30	15	0.05	255614 0120	60,10
16	12	21	15.4	13 x 4 mm	40	30	0.075	255614 0160	90,60
20	15	26	19.2	16 x 5 mm	50	45	0.1	255614 0200	108,-

2160



## ATORN® Exchangeable head quadrant milling cutter

VHM Typ N h10 h6 Z 4 TiAlN   816



material	● very well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		●	●	●	●	●		●	●				●	●	●					
		190	140	80	75	110		150	100				600	500	300					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

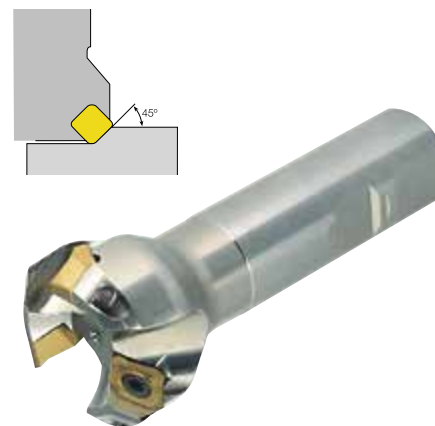
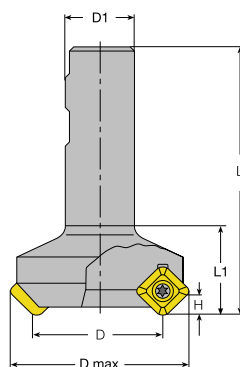
D mm	D2 mm	L2 mm	L1 mm	D1 mm	R mm	Wr. width mm	MD	Tightening torque max. N-m	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	7	14	7	1.5	8 x 3 mm	20	12	0.012	<b>255615 1015</b>	60,10
10	6	7	14	6	2.0	8 x 3 mm	20	12	0.012	255615 1020	60,10
12	7	9	17	7	2.5	10 x 4 mm	30	15	0.015	255615 1225	70,20
12	6	9	17	6	3.0	10 x 4 mm	30	15	0.015	255615 1230	70,20
16	9	12	21	9	3.5	13 x 4 mm	40	30	0.025	255615 1635	104,-
16	8	12	21	8	4.0	13 x 4 mm	40	30	0.025	255615 1640	104,-
16	7	12	21	7	4.5	13 x 4 mm	40	30	0.025	255615 1645	104,-
20	10	15	26	10	5.0	16 x 5 mm	50	45	0.032	255615 2050	132,50
20	8	15	26	8	6.0	16 x 5 mm	50	45	0.032	255615 2060	132,50



2160



**ATORN® 45° end milling cutter, SE.T 1204**



- For ISO milling inserts, type SE.T 1204
- Highly positive rake angle
- Weldon shank
- Easy-action, low-noise milling
- Large insert thickness
- For plunge milling and face milling
- Supplied with clamping screws and wrench
- Can be used on machines with low drive power and in unstable conditions
- **Cutting angle:** Tool cutting edge angle 45°, axial rake angle 16°, radial rake angle -6°



D mm	D1 mm	D max. mm	L mm	H mm	L1 mm	Z	Weight kg	Tightening torque max. N-m			art.no.	€
25.0	25	38.0	100	6	44	2	0.40	7.93	A1	B1	<b>260801 0025</b>	229,-
32.0	25	45.0	110	6	54	3	0.45	7.93	A1	B1	260801 0032	239,-
40.0	32	53.0	115	6	55	4	0.50	7.93	A1	B1	260801 0040	355,-

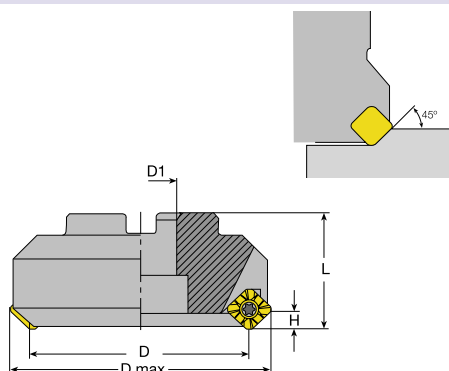
2124



**Spare parts**

Screw			Wrench		
	art.no.	€		art.no.	€
A1	321701 0108	9,75	B1	705141 0020	7,05
	3164			7114	

**ATORN® 45° face milling cutter**



- For ISO milling inserts, type SE.T 1204
- Highly positive rake angle
- Easy-action, low-noise milling
- Large insert thickness
- For plunge milling and face milling
- **Up to Ø 160 mm with internal coolant supply**
- Supplied with clamping screws and wrench
- Can be used on machines with low drive power and in unstable conditions
- **Cutting angle:** Tool cutting edge angle 45°, axial rake angle 20°, radial rake angle -10°



D mm	D1 mm	D max. mm	L mm	H mm	Z	Weight kg	Tightening torque max. N-m			art.no.	€
40.0	16	53.0	40	6	3	0.30	7.93	A1	B1	<b>260202 0040</b>	188,50
50.0	22	63.0	48	6	4	0.50	7.93	A1	B1	260202 0050	208,-
50.0	22	63.0	48	6	5	0.49	7.93	A1	B1	260202 0150	239,-
63.0	22	76.0	48	6	5	0.59	7.93	A1	B1	260202 0063	253,-
63.0	22	76.0	48	6	6	0.56	7.93	A1	B1	260202 0163	270,-
80.0	27	93.0	50	6	6	1.08	7.93	A1	B1	260202 0080	295,-
80.0	27	93.0	50	6	7	1.04	7.93	A1	B1	260202 0180	328,-
100.0	32	113.0	50	6	6	1.77	7.93	A1	B1	260202 0100	336,-
100.0	32	113.0	50	6	8	1.70	7.93	A1	B1	260202 1100	365,-
125.0	40	138.0	63	6	7	3.42	7.93	A1	B1	260202 0125	425,-
125.0	40	138.0	63	6	9	3.10	7.93	A1	B1	260202 1125	480,-
160.0	40	173.0	63	6	8	5.16	7.93	A1	B1	260202 0160	639,-
160.0	40	173.0	63	6	10	5.10	7.93	A1	B1	260202 1160	799,-
200.0	60	213.0	63	6	12	6.20	7.93	A1	B1	260202 0200	1.509,-
250.0	60	263.0	63	6	16	13.00	7.93	A1	B1	260202 0250	1.779,-

2124

**Spare parts**

Screw			Wrench		
	art.no.	€		art.no.	€
A1	321701 0108	9,75	B1	705141 0020	7,05
	3164			7114	

SEET

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
			SEET 1204 AF-FN			●	●			<b>HW 4410</b>	10 <b>284225 3001</b>	<b>9,60</b>
			SEET 1204 AFSN	●	●	●				<b>HC 4620</b>	10 284225 3005	<b>11,50</b>
			SEET 1204 AF-SN	●	●	●				<b>HC 4540</b>	10 284225 3007	<b>11,50</b>

2129

SEHT

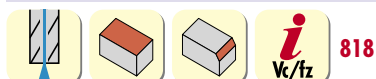
F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
			SEHT 1204 AFEN	●	●	●				<b>PH 6740</b>	10 <b>285229 0139</b>	<b>10,55</b>

2170

ISO	HC 4540	HC 4620	HW 4410
<b>ISO P</b> steel	Vc = 200 - 255	Vc = 205 - 280	
<b>ISO M</b> stainless steel	Vc = 120 - 150	Vc = 120 - 165	
<b>ISO K</b> cast iron	Vc = 190 - 240	Vc = 190 - 265	Vc = 125 - 145
<b>ISO N</b> Al/non-ferrous			Vc = 125 - 680
Vc = [m/min] fz = [mm/Z] ap = [mm]		fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

ISO	PH 6740
<b>ISO P</b> steel	Vc = 80 - 180
<b>ISO M</b> stainless steel	Vc = 80 - 220
<b>ISO K</b> cast iron	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	
fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

**ATORN® 45° face milling cutter**



- For ISO milling inserts, **SN.X 1206, SNMU 1260, ONMU1205**
- Innovative double-sided indexable cutting inserts with large rake angle, use of eight cutting edges (SN\_X, SNMU)
- Innovative double-sided indexable cutting inserts, use of sixteen cutting edges (ONMU)
- Easy cutting action with low machining force
- Excellent surface finish
- Very broad range of applications
- Use on many metals including steel, stainless steel, cast iron and aluminium
- Supplied with clamping screw and wrench
- ap max. 5.5 mm (SN\_X, SNMU)
- ap max. 3.0 mm (ONMU)



Standard

D mm	D2 mm	D3 mm	H mm	Z	Tightening torque max. N-m			art.no.	€
50.0	49	22	40	4	4.01	A1	B1	<b>262555 0050</b>	<b>255,-</b>
63.0	48	22	40	6	4.01	A1	B1	262555 0063	<b>301,-</b>
80.0	57	27	50	7	4.01	A1	B1	262555 0080	<b>365,-</b>
100.0	67	32	50	8	4.01	A1	B1	262555 0100	<b>390,-</b>
125.0	87	40	63	10	4.01	A1	B1	262555 0125	<b>445,-</b>
160.0	107	40	63	12	4.01	A1	B1	262555 0160	<b>689,-</b>
200.0	160	60	63	14	4.01	A1	B1	262555 0200	<b>1.399,-</b>
250.0	160	60	63	16	4.01	A1	B1	262555 0250	<b>1.499,-</b>

2124

Set includes SNMU 1260 and ONMU 1205 HC4630 indexable cutting inserts (10 of each)

D mm	D2 mm	D3 mm	H mm	Z	Tightening torque max. N-m	Contents	art.no.	€
63	48	22	40	6	4.01	incl. 10 indexable inserts SNMU 1260 and ONMU 1205 HC4630	<b>262555 2063</b>	<b>629,-</b>

2124

Narrow pitch

- Ø 160 mm supplied with sealing washers

D mm	D2 mm	D3 mm	H mm	Z	Tightening torque max. N-m			art.no.	€
50.0	42	22	40	6	4.01	A1	B1	<b>262555 1050</b>	<b>336,-</b>
63.0	49	22	40	8	4.01	A1	B1	262555 1063	<b>390,-</b>
80.0	57	27	50	10	4.01	A1	B1	262555 1080	<b>470,-</b>
100.0	67	32	50	12	4.01	A1	B1	262555 1100	<b>490,-</b>
125.0	87	40	63	16	4.01	A1	B1	262555 1125	<b>609,-</b>
160.0	107	40	63	20	4.01	A1	B1	262555 1160	<b>1.139,-</b>

2124

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	260124 0002	<b>9,50</b>	B1	703053 0200	<b>1,93</b>
3106			7114		

Continued on next page >>>



**Milling inserts**

ISO designation	ISO P	Coated HC4630 art.no.	€	ISO M	Coated HC 4535 art.no.	€	ISO P K	Coated HC4410 art.no.	€	ISO N	HW 4310 art.no.	€	ISO P M K	Coated HC4635 art.no.	€
SNEX 1206 ANN-MA										10	295730 0101	16,20			
SNKX 1206 ANN-MM1													10	295734 0101	15,50
SNMX 1206 ANN-MM	10	295732 0101	17,80	10	295731 0101	17,80	10	295733 0101	17,80						
		2129			2129			2129			2129				2129

**Double-sided,  
8 cutting edges, with  
chip breaker**

**Milling insert with chip breaker**

- For particularly good surface quality

ISO designation	ISO P M K	Coated HC4535 art.no.	€	ISO P K	Coated HC4410 art.no.	€
SNMU 1206 ANER	10	295735 0101	17,60	10	295737 0101	17,60
		2129			2129	



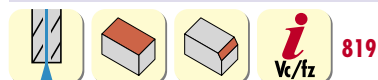
**double-sided,  
16 cutting edges**

**Milling insert with 16 cutting edges**

ISO designation	ISO P M K	Coated HC4630 art.no.	€	ISO P M	Coated HC4535 art.no.	€	ISO P K	Coated HC4410 art.no.	€
ONMU 1205 ANN	10	295738 0101	17,60	10	295739 0101	17,60	10	295740 0101	17,60
		2129			2129			2129	

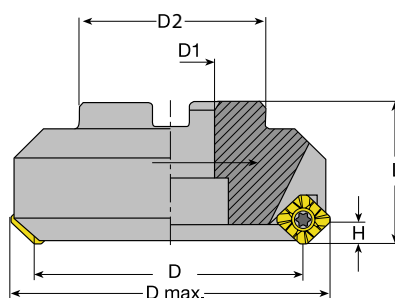


**palbit Face milling cutter 45° PLUS 91245**



- For ISO milling inserts SN.. 16.., ON.. 06..

- Excellent surface finish
- Very broad range of applications
- Wide range of materials, including steel, stainless steel, cast iron and aluminium
- Supplied with clamping screw and wrench
- ap. max. 8.5 mm (SN..)
- ap. max. 3.8 mm (ON..)



D mm	D1 mm	D max. mm	D2 mm	L mm	H mm	Z	Weight kg	Tightening torque max. N-m	suitable indexable inserts	A1	B1	C1	art.no.	€
63	22	80.1	52	50	8.5/3.8	5	0.81	5.0	SN..16/ON..06	A1	B1	C1	260211 0063	490,-
80	27	97.1	60	50	8.5/3.8	6	1.06	5.0	SN..16/ON..06	A1	B1	C1	260211 0080	529,-
80	27	97.1	60	50	8.5/3.8	8	1.09	5.0	SN..16/ON..06	A1	B1	C1	260211 0081	609,-
100	32	117.1	80	63	8.5/3.8	7	2.24	5.0	SN..16/ON..06	A1	B2	C1	260211 0100	659,-
100	32	117.1	80	63	8.5/3.8	10	2.28	5.0	SN..16/ON..06	A1	B2	C1	260211 0101	719,-
125	40	142.1	90	63	8.5/3.8	8	3.04	5.0	SN..16/ON..06	A1		C1	260211 0125	759,-
160	40	177.1	110	63	8.5/3.8	10	4.4	5.0	SN..16/ON..06	A1		C1	260211 0160	989,-
200	60	217.1	172	63	8.5/3.8	12	9.12	5.0	SN..16/ON..06	A1		C1	260211 0200	1.299,-
250	60	267.1	172	63	8.5/3.8	14	11.93	5.0	SN..16/ON..06	A1		C1	260211 0250	1.429,-




2174

**Spare parts**

Screw		Cutter retaining screw with through-hole		TORX	
art.no.	€	art.no.	€	art.no.	€
A1 321099 0019	4,07	B1 321099 0043	44,50	C1 703053 0200	1,93
		B2 321099 0044	44,50		
3160		3160		7114	




## Indexable milling inserts SN..1606 / ON..0606 PLUS 91245

### SNHX 1606..

F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
-	-	-		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
	SNHX 1606 ANER-LP			●	●					PH 7740	10 285217 0148	22,80
	SNHX 1606 ANER-MP			●	●					PH 7740	10 285217 0248	22,80
	SNHX 1606 ANER-MK					●				PH 7920	10 285217 0250	22,80
	SNHX 1606 ANER-LP			●		●				PH 5740	10 285217 0330	22,80
	SNHX 1606 ANER-LP			●		●				PHP 920	10 285217 0191	24,40
	SNHX 1606-MP			●		●				PHP 930	10 285217 0190	24,40
			●		●				PHP 920	10 285217 0291	24,40	




2170

### SNKX 1606..

F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
-	-	-		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
	SNKX 1606 ANER-MP			●						PH 7740	10 285218 0148	19,60
	SNKX 1606 ANER-MP			●						PH 7920	10 285218 0150	19,60
	SNKX 1606 ANER-MK					●				PH 5740	10 285218 0230	19,60




2170

### ONHX 0606..

F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
-	-	-		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
	ONHX 0606 ANEN-LP			●	●					PH 7740	10 285222 0148	22,80
	ONHX 0606 ANEN-MP			●	●					PH 7740	10 285222 0248	22,80
	ONHX 0606 ANEN-MK					●				PH 5705	10 285222 0328	22,80
	ONHX 0606 ANEN-MK					●				PH 5740	10 285222 0330	22,80
	ONHX 0606 ANEN-W					●				PH 5705	10 285222 0428	26,50
	ONHX 0606 ANEN-W			●						PH 7920	10 285222 0450	26,50
	ONHX 0606 ANEN-LP			●		●				PHP 920	10 285222 0191	24,40
	ONHX 0606 ANEN-LP			●		●				PHP 930	10 285222 0190	24,40
ONHX 0606 ANEN-MP			●		●				PHP 920	10 285222 0291	24,40	

2170

### ONKX 0606..

F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
-	-	-		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
	ONKX 0606 ANEN-LP					●				PH 5320	10 285228 0126	19,60
	ONKX 0606 ANEN-LP			●	●					PH 7740	10 285228 0148	19,60
	ONKX 0606 ANEN-LP			●						PH 7920	10 285228 0150	19,60
	ONKX 0606 ANEN-LP				●					PH 7930	10 285228 0151	19,60
	ONKX 0606 ANEN-MP			●						PH 7740	10 285228 0248	19,60
	ONKX 0606 ANEN-MK					●				PH 5705	10 285228 0328	19,60
	ONKX 0606 ANEN-MK					●				PH 5740	10 285228 0330	19,60
	ONKX 0606 ANEN-LP			●		●				PHP 920	10 285228 0191	21,20
ONKX 0606 ANEN-MP			●		●				PHP 920	10 285228 0291	21,20	

2170

ISO	PH 5740	PH 7740	PH 7920	PHP 920	PHP 930
ISO P steel		Vc = 120 - 240	Vc = 140 - 320	Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel		Vc = 80 - 160			
ISO K cast iron	Vc = 115 - 290			Vc = 120 - 270	Vc = 100 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.4 ap = max. 3.8				

ISO	PH 5740	PH 7740	PH 7920
ISO P steel		Vc = 120 - 240	Vc = 140 - 320
ISO K cast iron	Vc = 115 - 290		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.4 ap = max. 3.8		

ISO	PH 5705	PH 5740	PH 7740	PH 7920	PHP 920	PHP 930
ISO P steel			Vc = 120 - 240	Vc = 140 - 320	Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel			Vc = 80 - 160			
ISO K cast iron	Vc = 130 - 350	Vc = 115 - 290			Vc = 120 - 270	Vc = 100 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.17 ap = max. 8.5					

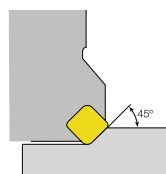
ISO	PH 5320	PH 5705	PH 5740	PH 7740	PH 7920	PH 7930	PHP 920
ISO P steel				Vc = 120 - 240	Vc = 140 - 320		Vc = 140 - 250
ISO M stainless steel				Vc = 80 - 160		Vc = 90 - 200	
ISO K cast iron	Vc = 130 - 350	Vc = 130 - 350	Vc = 115 - 290				Vc = 120 - 270
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.17 ap = max. 8.5						



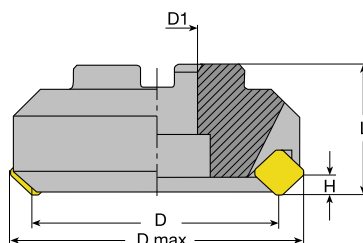
## ATORN® 45° face milling cutter



- For ISO milling inserts, type SE.N 1203
- Highly positive cutting edge geometry
- Easy cutting action
- Also for machines with low drive power or unstable conditions
- Wedge for fast and reliable clamping of the indexable insert
- Supplied with clamping screws and wrench
- from Ø 160 mm with sealing washers
- **Cutting angle:** Tool cutting edge angle 45°, axial rake angle 20°, radial rake angle -4.5°



Ø 160 to 250 mm with sealing washers



D mm	D1 mm	D max. mm	L mm	H mm	Z	Weight kg	Tightening torque max. N-m					art.no.	€
50.0	22	63	48	6	4	0.53	4.01	A1	B1	C1	D1	<b>260200</b> 0050	301,-
63.0	22	76	40	6	5	0.60	4.01	A1	B1	C1	D1	260200 0063	375,-
80.0	27	93	50	6	6	1.10	4.01	A1	B1	C1	D1	260200 0080	395,-
100.0	32	113	50	6	6	1.80	4.01	A1	B1	C1	D1	260200 0100	455,-
125.0	40	138	63	6	7	3.40	4.01	A1	B1	C1	D1	260200 0125	569,-
160.0	40	173	63	6	7	5.20	4.01	A1	B1	C1	D1	260200 0160	689,-
200.0	60	213	63	6	10	8.60	4.01	A1	B1	C1	D1	260200 0200	979,-
250.0	60	263	63	6	13	14.20	4.01	A1	B1	C1	D1	260200 0250	1.169,-

2124

### Spare parts

Spacer		Screw		Clamping screw		TORX					
art.no.	€	art.no.	€	art.no.	€	art.no.	€				
A1	321701 0002	12,10	B1	321701 0109	6,85	C1	321701 0111	14,75	D1	703040 1250	7,95
	3106		3106		3106		7111				

### SEEN

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation									
Universal application			SEEN 1203 AFFN	•	•					HC 4620	10 284215 2905	11,40
				•	•	•				HC 4540	10 284215 2907	11,40
			SEEN 1203 AF-SN	•						HW 4640	10 284215 3003	8,05
				•	•					HC 4620	10 284215 3005	11,60
				•	•	•				HC 4540	10 284215 3007	11,60

2129

ISO	HC 4540	HC 4620	HW 4640
ISO P steel	Vc = 180 - 230	Vc = 120 - 210	Vc = 90 - 190
ISO M stainless steel	Vc = 105 - 135	Vc = 110 - 155	
ISO K cast iron	Vc = 170 - 215		
Vc = [m/min] fz = [mm/Z] ap = [mm]		fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

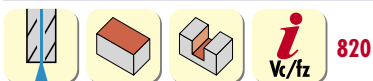
### SEKN

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation									
Universal application			SEKN 1203 AFSN	•	•	•				PH 6920	10 285448 0142	8,95

2170

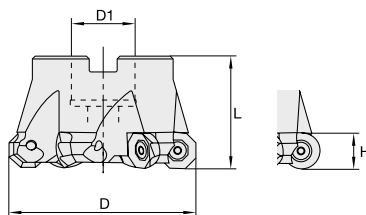
ISO	PH 6920
ISO P steel	Vc = 120 - 250
ISO M stainless steel	Vc = 100 - 200
ISO K cast iron	Vc = 120 - 220
Vc = [m/min] fz = [mm/Z] ap = [mm]	
fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

## ATORN® Face and copy milling cutter (OCKX, XCKX, RCKX)



• Can be fitted with octagonal, double-hexagon or round milling inserts

- High feed rates and smooth operation
- Low power requirements due to small number of teeth
- Allows axial and diagonal plunging, well suited to excavation and pocket milling
- Directly-pressed indexable insert with 8 or 12 effective cutting edges
- Stable insert seat, anti-twist protection and defined indexing possible
- Indexable insert with rotational direction index, reliable production and high usability



• Ø 125 mm without internal coolant supply

D mm	H mm	L mm	D1 mm	Z	Tightening torque max. N-m	A1	B1	art.no.	€
52.0	16	40	22	4	10	A1	B1	260111 0052	257,-
66.0	16	50	27	5	10	A1	B1	260111 0066	285,-
80.0	16	50	27	6	10	A1	B1	260111 0080	346,-
100.0	16	50	32	7	10	A1	B1	260111 0100	399,-
125.0	16	63	40	8	10	A1	B1	260111 0125	589,-
2125									

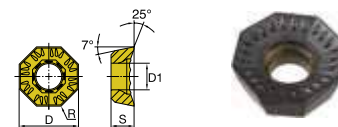
### Spare parts

Screw			Wrench		
art.no.	€		art.no.	€	
A1 260400 0050	6,05		B1 705141 0015	6,35	
2125			7114		

### OCKX octagonal milling inserts

- With cutting depths up to  $a_p = 3$  mm, all 8 cutting edges can be used

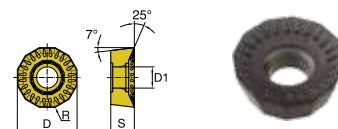
ISO designation	S mm	D mm	D1 mm	R mm	ISO	ISO		ISO		
						art.no.	€	art.no.	€	
OCKX 0606 AD-TR	6.35	16.0	5.8	0.5	10	270100 0624	11,15	10	270100 0661	11,15
2126						2126				



### XCKX double-hexagon milling inserts

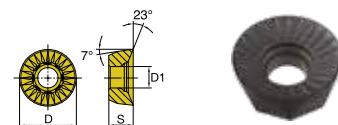
- With cutting depths up to  $a_p = 1$  mm, all 12 cutting edges can be used

ISO designation	S mm	D mm	D1 mm	ISO	ISO		
					art.no.	€	
XCKX 1606 ZDR-TR	6.35	16.0	5.8	10	270101 1624	11,80	
2126						2126	



### RCKX round milling inserts

ISO designation	S mm	D mm	D1 mm	ISO	ISO	
					art.no.	€
RCKX 1606 MO-TR	6.35	16.0	5.8	10	270102 1624	10,15
2126					2126	

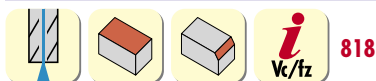


Precision ...

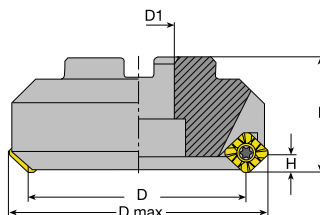
... but digital.

**ATORN®**  
Performance demands quality

## SARA® Smooth-running 45° face milling cutter



- For ISO milling inserts, SE.. 13T3
- Internal cooling up to Ø 125 mm
- High productivity from finishing to roughing
- Excellent surface finish
- Very broad range of applications
- Universal application for steel, stainless steel and cast iron
- Supplied with clamping screw and wrench
- **Now also with indexable cutting insert for non-ferrous materials**
- **ap max. 6 mm**



**Compatible with: SANDVIK  
Coro Mill® 245, MITSUBISHI  
ASX445, SUMITOMO WGC**

### Narrow pitch

D mm	D max. mm	D1 mm	L mm	H mm	Z	Tightening torque max. N-m			art.no.	€
50.0	63.0	22	40	6	4	2.68	A1	B1	262550 0050	229,-
63.0	76.0	22	40	6	5	2.68	A1	B1	262550 0063	275,-
80.0	93.0	27	50	6	6	2.68	A1	B1	262550 0080	341,-
100.0	113.0	32	50	6	7	2.68	A1	B1	262550 0100	390,-
125.0	138.0	40	63	6	8	2.68	A1	B1	262550 0125	455,-
160.0	173.0	40	63	6	10	2.68	A1	B1	262550 0160	879,-
200.0	213.0	60	63	6	12	2.68	A1	B1	262550 0200	1.279,-
250.0	263.0	60	63	6	16	2.68	A1	B1	262550 0250	1.639,-

2118

### Extra-narrow pitch

D mm	D max. mm	D1 mm	L mm	H mm	Z	Tightening torque max. N-m			art.no.	€
50.0	63.0	22	40	6	5	2.68	A1	B1	262550 1050	290,-
63.0	76.0	22	40	6	6	2.68	A1	B1	262550 1063	346,-
80.0	93.0	27	50	6	8	2.68	A1	B1	262550 1080	405,-
100.0	113.0	32	50	6	10	2.68	A1	B1	262550 1100	490,-
125.0	138.0	40	63	6	12	2.68	A1	B1	262550 1125	589,-
160.0	173.0	40	63	6	16	2.68	A1	B1	262550 1160	1.069,-

2118

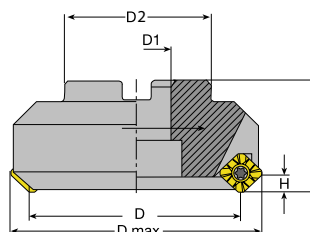
### Spare parts

Screw			Wrench		
art.no.	€		art.no.	€	
A1 262551 3511	8,95	3106	B1 705141 0015	6,35	7114

## palbit® Face milling cutter 45° LINEPRO 09945



- For ISO milling inserts SE.. 13T3
- Highly positive rake angle
- **With spacers to protect the milling shank**
- Smooth, low-noise milling
- For plunge milling and face milling
- Supplied with spacers, clamping screws and wrench
- **Cutting angle:** Tool cutting-edge angle 45°, axial rake angle 20°



**With spacers**



D mm	D1 mm	D max. mm	D2 mm	L mm	H mm	Z	Weight kg	Tightening torque max. N-m	suitable indexable inserts					art.no.	€
50	22	63	40	40	6.0	4	0.36	3.0	SE..13T3	A1	B1	C1	D1	260213 0050	273,-
63	22	76	48	40	6.0	5	0.59	3.0	SE..13T3	A1	B1	C1	D1	260213 0063	333,-
80	27	93	60	50	6.0	6	1.02	3.0	SE..13T3	A1	B1	C1	D1	260213 0080	395,-
100	32	113	70	50	6.0	7	1.52	3.0	SE..13T3	A1	B1	C1	D1	260213 0100	485,-
125	40	138	90	63	6.0	8	3.16	3.0	SE..13T3	A1	B1	C1	D1	260213 0125	579,-
160	40	173	110	63	6.0	10	4.61	3.0	SE..13T3	A1	B1	C1	D1	260213 0160	789,-


2174

### Spare parts

Spacer			Screw			Screw for spacer			TORX		
art.no.	€		art.no.	€		art.no.	€		art.no.	€	
A1 260219 0101	5,30	3160	B1 321099 0011	4,07	3160	C1 321099 0046	6,05	3160	D1 703053 0150	1,93	7114

## Milling inserts SE..13T3.. LINEPRO 09945


## SEHT 13T3

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			SEHT 13T3 AGSN	●	●	●				PH 6740	10 285234 0139	12,50
				●		●				PH 6920	10 285234 0142	12,50

2170

ISO	PH 6740	PH 6920
ISO P steel	Vc = 100 - 160	Vc = 130 - 230
ISO M stainless steel	Vc = 70 - 120	
ISO K cast iron	Vc = 80 - 250	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.25 ap = 0.05 - 6.0	


## SEHW 13T3

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			SEHW 13T3 AGFN	●		●				PH 6920	10 285237 0142	12,50

2170

ISO	PH 6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.25 ap = 0.05 - 6.0


## SEHT 13T3 ALU

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			SEHT 13T3 AGFN-LN				●			PH 0910	10 285234 0320	12,50

2171

ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.2 ap = 0.05 - 6.0

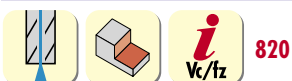
## SEHT 13T3 WIPER

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			SEHT 13T3 AGSN-WIPER	●		●				PH 6920	10 285234 0442	14,80
			<b>For finishing machining</b>									

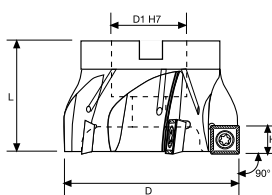
2170

ISO	PH 6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 ap = 0.05 - 6.0

## ATORN® 90° shoulder milling cutter



- For ISO milling inserts, type SDMT 1205 PDR.69
- Exactly 90°
- Internal coolant supply
- General corner milling and face milling
- Drilling by means of circular interpolation
- Insert design with four cutting edges per plate
- Cutting depths up to max. 10.5 mm



D mm	D1 H7 mm	L mm	H mm	Z	Tightening torque max. N-m			art.no.	€
40.0	16.0	45	10.5	4	4.01	A1	B1	262547 0040	380,-
50.0	22.0	40	10.5	5	4.01	A1	B1	262547 0050	380,-
63.0	22.0	40	10.5	6	4.01	A1	B1	262547 0063	380,-
80.0	27.0	50	10.5	6	4.01	A1	B1	262547 0080	435,-
100.0	32.0	50	10.5	8	4.01	A1	B1	262547 0100	589,-
125.0	40.0	63	10.5	9	4.01	A1	B1	262547 0125	689,-

2124

### Spare parts

Screw			Wrench		
	art.no.	€		art.no.	€
A1	320901 2504	6,45	B1	705141 0015	6,35
	3106			7114	

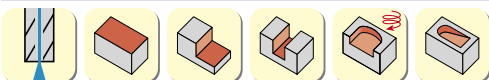
### Indexable cutting inserts

ISO designation	ISO	HC 4625	€
SDMT 1205 PDR69	10	283310 2765	18,95

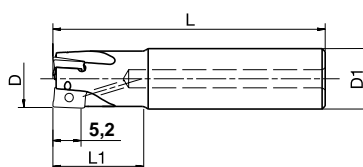
2129



## ATORN® 90° end milling cutter



- For ISO milling inserts, type AP.. 0602
- Internal coolant supply
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° corner milling
- Supplied with clamping screws and wrench



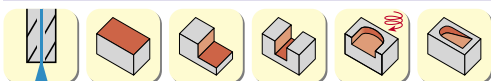
D mm	D1 h6 mm	L mm	L1 mm	Z	Tightening torque max. N-m			art.no.	€
10	10	80	28	2	0.6	A1	B1	262534 0010	121,-
12	12	80	30	3	0.6	A1	B1	262534 0012	154,-
14	12	85	32	3	0.6	A1	B1	262534 0014	160,-
16	16	85	35	4	0.6	A1	B1	262534 0016	195,50
18	16	90	38	4	0.6	A1	B1	262534 0018	202,-
20	20	90	40	5	0.6	A1	B1	262534 0020	227,-
25	20	106	50	7	0.6	A1	B1	262534 0025	253,-
32	25	124	64	8	0.6	A1	B1	262534 0032	269,-

2124

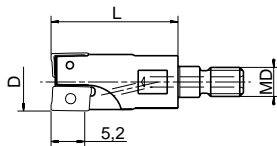
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 1801	8,-	B1	703053 0060	1,93
	3106			7114	

### ATORN® 90° screw-in milling cutter



- For ISO milling inserts, type AP.. 0602
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm

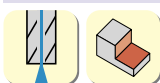


D mm	L mm	MD	Z	Tightening torque max. N-m			art.no.	€
10	16	M6	2	0.6	A1	B1	262536 0010	119,50
12	16	M6	3	0.6	A1	B1	262536 0012	156,-
16	21	M8	4	0.6	A1	B1	262536 0016	185,50
20	26	M10	5	0.6	A1	B1	262536 0020	201,-
25	30	M12	7	0.6	A1	B1	262536 0025	217,-

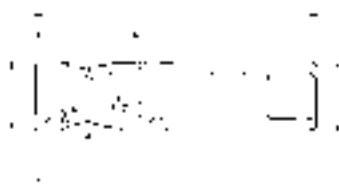
#### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 1801	8,-	B1	703053 0060	1,93
	3106			7114	

### ATORN® Roughing spiral flute milling cutter 90°



- For ISO milling inserts, type AP.. 0602
- Soft cutting due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm

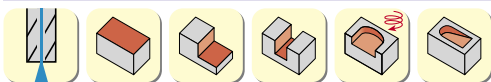


D mm	D1 h6 mm	L mm	L1 mm	Z	Tightening torque max. N-m			art.no.	€
16	16	80	19.8	8	0.6	A1	B1	262537 0016	450,-
20	20	90	24.6	15	0.6	A1	B1	262537 0020	669,-
25	25	100	29.4	30	0.6	A1	B1	262537 0025	839,-

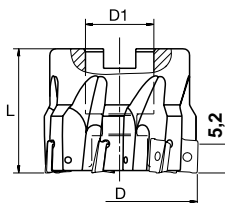
#### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 1801	8,-	B1	703053 0060	1,93
	3106			7114	

### ATORN® 90° corner milling cutter



- For ISO milling inserts, type AP.. 0602
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm



D mm	D1 H7 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
32	16	40	8	0.6	A1	B1	262535 0032	279,-
40	16	40	10	0.6	A1	B1	262535 0040	312,-
50	22	40	11	0.6	A1	B1	262535 0050	336,-

#### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 1801	8,-	B1	703053 0060	1,93
	3106			7114	

#### APKT

F finishing	M medium	R roughing	ATORN®						Quality		art.no.	€		
•	•	•	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	HC 4635					
<p>Universal application</p>			APKT 060204 PDTR-K									10	281518 0609	9,15

ISO	HC 4635
ISO P steel	Vc = 70 - 130
ISO M stainless steel	Vc = 60 - 100
ISO K cast iron	Vc = 120 - 200
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.03 - 0.25 per cutting edge ap = 0.1 - 3.0

APMX

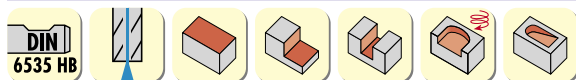
F finishing	M medium	R roughing	ATORN <sup>®</sup>	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
				APMX 0602							HC 4635	10 281525 0602	14,75
											HC 4410	10 281525 0605	14,75
											HC 4535	10 281525 0607	14,75

ISO	HC 4410	HC 4535	HC 4635
ISO K cast iron			Vc = 120 - 330
ISO M stainless steel		Vc = 120 - 180	Vc = 100 - 160
ISO P steel	Vc = 160 - 250	Vc = 140 - 230	Vc = 160 - 220
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.4 - 0.6 ap = 0.3		

2129

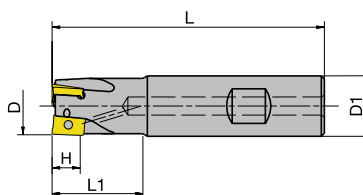
palbit 90° LINEPRO 17090 end milling cutter

NEW



- For ISO milling inserts, type AP.. 1003
- Internal coolant supply

- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° corner milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench



D mm	D1 h6 mm	L mm	L1 mm	H mm	Z	Tightening torque max. N-m			art.no.	€
16	16	85	26	9.3	2	1.2	A3	C3	260259 0016	136,-
16	16	150	26	9.3	2	1.2	A3	C3	260259 0017	156,-
20	20	90	28	9.3	3	1.2	A3	C3	260259 0020	163,-
20	20	150	28	9.3	3	1.2	A3	C3	260259 0021	197,-
25	20	150	26	9.3	4	1.2	A3	C3	260259 0025	223,-
25	25	95	30	9.3	4	1.2	A3	C3	260259 0026	190,-

2174

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
	A3 321099 0005	4,07		C3 703053 0080	1,93
		3160			7114

Set version

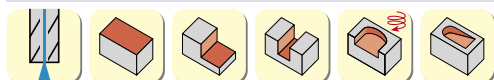
Contents		art.no.	€
End milling cutter Ø20 Z3 plus 50 x APKT 1003-PDS-R PH7930		260259 1020	719,-

2170



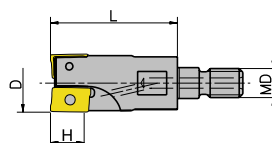
palbit Screw-in milling cutter 90° LINEPRO 17090

NEW



- For ISO milling inserts, type AP.. 1003

- Easy cutting action thanks to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Internal coolant supply
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm




D mm	L mm	MD	H mm	Z	Tightening torque max. N-m			art.no.	€
16	25	M8	9.3	2	1.2	A1	B1	260260 0016	164,-
20	30	M10	9.3	3	1.2	A1	B1	260260 0020	182,50
25	35	M12	9.3	4	1.2	A1	B1	260260 0025	194,50

2174

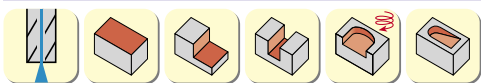
Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
	A1 321099 0005	4,07		B1 703053 0080	1,93
		3160			7114

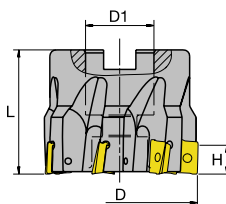




palbit  Shoulder milling cutter 90° LINEPRO 17090

**NEW**





- For ISO milling inserts, type AP.. 1003
- Easy cutting action thanks to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm






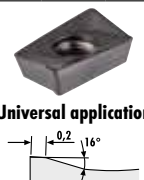


D mm	D1 H7 mm	L mm	H mm	Z	Tightening torque max. N·m			art.no.	€
40	22	40	9.3	6	1.2	A1	B1	260261 0040	290,-
50	22	40	9.3	7	1.2	A1	B1	260261 0050	319,-
63	22	40	9.3	8	1.2	A1	B1	260261 0063	347,-
2174									

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0005	4,07	B1	703053 0080	1,93
		3160			7114






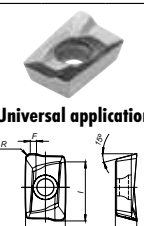


**APKT 10 PDS-R**

F finishing	M medium	R roughing	palbit 	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
•	•	•	ISO designation							PH 7930	10	281514 1051	10,95
 <div style="display: inline-block; border: 2px solid red; padding: 5px; transform: rotate(-2deg); font-weight: bold; color: white;">Universal insert</div>													

2170

ISO	PH 7930
ISO P steel	Vc = 120 - 180
ISO M stainless steel	Vc = 70 - 150
ISO K cast iron	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length






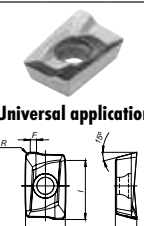


**APKT 10 PDER-X1**

F finishing	M medium	R roughing	palbit 	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€				
•	•	•	ISO designation							PH 6920	10	285320 0242	8,40				
																	
  <td>PH 6930</td> <td>10</td> <td>285320 0243</td> <td>8,40</td>														PH 6930	10	285320 0243	8,40

2170

ISO	PH 6920	PH 6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO M stainless steel		Vc = 70 - 150
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length	

**APKT 10 PDSR-X1**

F finishing	M medium	R roughing	palbit 	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€				
•	•	•	ISO designation							PH 6920	10	285321 0342	8,40				
																	
  <td>PH 6930</td> <td>10</td> <td>285321 0343</td> <td>8,40</td>														PH 6930	10	285321 0343	8,40

2170

ISO	PH 6920	PH 6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	

Continued on next page >>>

**APKT 10 PDER-X**

<b>F</b> finishing	<b>M</b> medium	<b>R</b> roughing	<b>palbit</b>	<b>ISO P</b>	<b>ISO M</b>	<b>ISO K</b>	<b>ISO N</b>	<b>ISO S</b>	<b>ISO H</b>	<b>Quality</b>		art.no.	€
•	•	•	<b>ISO designation</b>	●	○	●	○	○	○	<b>PH 6920</b>		10 <b>285322 0442</b>	<b>8,40</b>
			APKT 100308 PDER-X	○	●	○	○	○	○	<b>PH 6930</b>		10 285322 0443	<b>8,40</b>
<b>Universal application</b> 													

2170

<b>ISO</b>	<b>PH 6920</b>	<b>PH 6930</b>
<b>ISO P</b> steel	Vc = 130 - 230	Vc = 120 - 180
<b>ISO M</b> stainless steel		Vc = 70 - 150
<b>ISO K</b> cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length	

**APKT 10 PDSR-X**

<b>F</b> finishing	<b>M</b> medium	<b>R</b> roughing	<b>palbit</b>	<b>ISO P</b>	<b>ISO M</b>	<b>ISO K</b>	<b>ISO N</b>	<b>ISO S</b>	<b>ISO H</b>	<b>Quality</b>		art.no.	€
•	•	•	<b>ISO designation</b>	●	○	●	○	○	○	<b>PH 6920</b>		10 <b>285323 0542</b>	<b>8,40</b>
			APKT 100308 PDSR-X	○	●	○	○	○	○	<b>PH 6920</b>		10 285323 0542	<b>8,40</b>
<b>Universal application</b> 													

2170

<b>ISO</b>	<b>PH 6920</b>
<b>ISO P</b> steel	Vc = 130 - 230
<b>ISO K</b> cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length

**APKT 10 PDTR-X**

<b>F</b> finishing	<b>M</b> medium	<b>R</b> roughing	<b>palbit</b>	<b>ISO P</b>	<b>ISO M</b>	<b>ISO K</b>	<b>ISO N</b>	<b>ISO S</b>	<b>ISO H</b>	<b>Quality</b>		art.no.	€
•	•	•	<b>ISO designation</b>	●	○	●	○	○	○	<b>PH 6920</b>		10 <b>285324 0642</b>	<b>8,40</b>
			APKT 100308 PDTR-X	○	●	○	○	○	○	<b>PH 6920</b>		10 285324 0642	<b>8,40</b>
<b>Universal application</b> 													

2170

<b>ISO</b>	<b>PH 6920</b>
<b>ISO P</b> steel	Vc = 130 - 230
<b>ISO K</b> cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length

**YOUR DRILL**

# **GIVES UP.**

**WHAT DO YOU DO? YOU REACH**

# **FOR A NEW ONE**

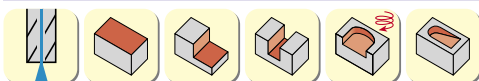
**AND SIMPLY CARRY ON:**

## **SARA®GO TOOL DISPENSING SYSTEM.**

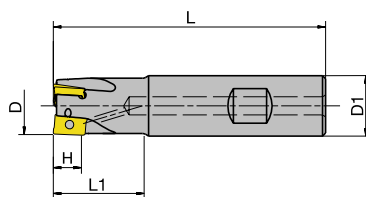
**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE



## ATORN® 90° end milling cutter



- For ISO milling inserts, type AP.. 1003
- Internal coolant supply
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° shoulder milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench





### Short

D mm	D1 h6 mm	L mm	L1 mm	L4 mm	Z	Tightening torque max. N·m			art.no.	€
10.0	16	80	24	56	1	1.0	A1	B1	<b>262540 0100</b>	<b>97,70</b>
11.0	16	80	24	56	1	1.0	A1	B1	262540 0110	142,-
12.0	16	80	24	56	1	1.0	A1	B1	262540 0120	97,70
13.0	16	80	24	56	1	1.0	A1	B1	262540 0130	142,-
14.0	16	80	24	56	1	1.0	A1	B1	262540 0140	126,50
15.0	16	85	25	60	2	1.0	A1	B1	262540 0150	142,-
15.7	16	85	25	60	2	1.0	A1	B1	262540 0157	163,-
16.0	16	85	25	60	2	1.0	A1	B1	262540 0160	131,-
17.0	16	85	25	60	2	1.0	A1	B1	262540 0170	185,50
18.0	20	85	25	60	2	1.0	A1	B1	262540 0180	142,-
19.5	20	90	25	65	3	1.0	A1	B1	262540 0195	250,-
19.7	20	90	25	65	3	1.0	A1	B1	262540 0197	270,-
20.0	20	90	25	65	3	1.0	A1	B1	262540 0200	163,-
22.0	25	95	25	70	3	1.0	A1	B1	262540 0220	185,50
24.7	25	95	25	70	4	1.0	A1	B1	262540 0247	270,-
25.0	25	95	25	70	4	1.0	A1	B1	262540 0250	196,-
28.0	25	95	25	70	4	1.0	A1	B1	262540 0280	217,-
30.0	25	95	25	70	4	1.0	A1	B1	262540 0300	217,-
32.0	25	95	31	70	5	1.0	A1	B1	262540 0320	229,-

2124





### Long

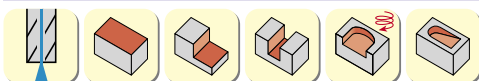
D mm	D1 h6 mm	L mm	L1 mm	L4 mm	Z	Tightening torque max. N·m			art.no.	€
10.0	16	150	24	126	1	1.0	A1	B1	<b>262540 0101</b>	<b>153,-</b>
12.0	16	150	24	126	1	1.0	A1	B1	262540 0121	153,-
16.0	16	150	100	126	2	1.0	A1	B1	262540 0161	174,50
18.0	16	150	25	126	2	1.0	A1	B1	262540 0181	251,-
20.0	20	150	100	125	3	1.0	A1	B1	262540 0201	217,-
25.0	20	150	100	125	4	1.0	A1	B1	262540 0251	260,-
32.0	25	150	26	124	5	1.0	A1	B1	262540 0321	305,-

2124

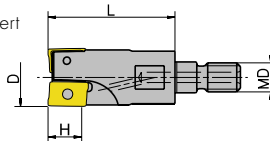
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025	5,45	B1	703053 0080	1,93
		3106			7114

## ATORN® 90° screw-in milling cutter



- For ISO milling inserts, type AP.. 1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm



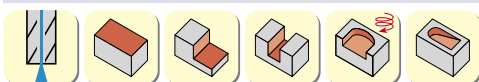
D mm	L mm	MD	Z	Tightening torque max. N-m			art.no.	€
10.0	20	M6	1	1.0	A1	B1	262542 0010	163,-
12.0	20	M6	1	1.0	A1	B1	262542 0012	163,-
16.0	25	M8	2	1.0	A1	B1	262542 0016	173,50
20.0	30	M10	3	1.0	A1	B1	262542 0020	183,50
25.0	35	M12	4	1.0	A1	B1	262542 0025	255,-
28.0	35	M12	4	1.0	A1	B1	262542 0028	323,-
30.0	34	M16	4	1.0	A1	B1	262542 0030	323,-
32.0	43	M16	5	1.0	A1	B1	262542 0032	313,-

2124

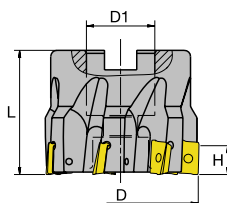
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025	5,45	B1	703053 0080	1,93
	3106			7114	

## ATORN® 90° shoulder milling cutter



- For ISO milling inserts, type AP.. 1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm



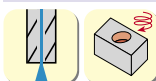
D mm	D1 H7 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
40.0	16.0	40	6	1.0	A1	B1	262546 0040	238,-
50.0	22.0	40	7	1.0	A1	B1	262546 0050	260,-
63.0	22.0	40	8	1.0	A1	B1	262546 0063	282,-
80.0	27.0	50	11	1.0	A1	B1	262546 0080	405,-
100.0	32.0	50	12	1.0	A1	B1	262546 0100	470,-

2124

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025	5,45	B1	703053 0080	1,93
	3106			7114	

## ATORN® 90° drilling/die sinking cutter



- For ISO milling inserts, type AP.. 1003
- **Internal coolant supply**
- With Weldon shank
- High cutting capacity
- Reliable chip flow even when drilling due to positive indexable insert geometry
- Supplied with clamping screws and wrench

### Short

D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
20.0	20	17	35	90	3	1.0	A1	B1	262515 0002	239,-
25.0	25	19	50	110	3	1.0	A1	B1	262515 0003	280,-

2124

### Long

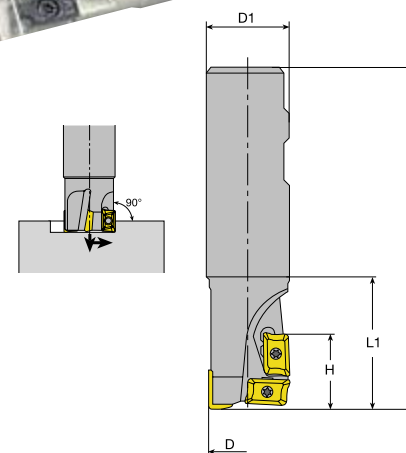
D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
20.0	20	17	98	150	3	1.0	A1	B1	262516 0002	306,-
25.0	25	19	94	150	3	1.0	A1	B1	262516 0003	332,-

2124

### Extra-long

D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
20	20	17	125	180	3	1.0	A1	B1	262517 0020	294,-
25	25	19	140	200	3	1.0	A1	B1	272517 0025	339,-

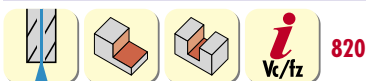
2124



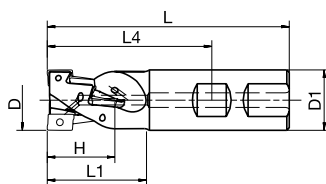
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025	5,45	B1	703053 0080	1,93
	3106			7114	

## ATORN® 90° roughing spiral flute end mill



- For ISO milling inserts, type AP.. 1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- Shank according to DIN 1835B



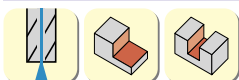
D mm	D1 mm	L mm	L1 mm	L4 mm	H mm	Z	Z eff.	Tightening torque max. N-m			art.no.	€
20.0	20	87	37	58	28	4	1	1.0	A1	B1	<b>262544 0020</b>	<b>315,-</b>
25.0	25	105	49	64	37	8	2	1.0	A1	B1	262544 0025	<b>370,-</b>
32.0	32	115	55	75	46	10	2	1.0	A1	B1	262544 0032	<b>569,-</b>
32.0	32	115	55	75	46	15	3	1.0	A1	B1	262544 0033	<b>819,-</b>
40.0	32	130	70	76	55	18	3	1.0	A1	B1	262544 0040	<b>719,-</b>

2124

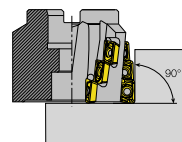
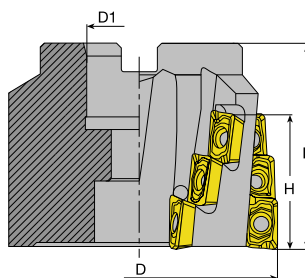
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 262551 0025	<b>5,45</b>		B1 703053 0080	<b>1,93</b>	
3106			7114		

## ATORN® 90° roughing spiral flute milling cutter



- For ISO milling inserts, type AP.. 1003
- **Internal coolant supply**
- Just one insert type for both face and side cutting edges
- High right-hand helix configuration for good chip shaping
- Full coverage within one row of teeth
- Supplied with clamping screws and wrench



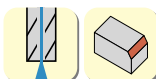
D mm	D1 mm	H mm	L mm	Z eff.	Z	Tightening torque max. N-m			art.no.	€
40.0	16	37	50	3	12	1.0	A1	B1	<b>262529 0040</b>	<b>649,-</b>
50.0	22	46	60	3	15	1.0	A1	B1	262529 0050	<b>819,-</b>
63.0	27	46	60	4	20	1.0	A1	B1	262529 0063	<b>959,-</b>

2124

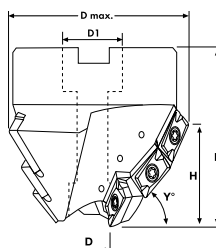
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 262551 0025	<b>5,45</b>		B1 703053 0080	<b>1,93</b>	
3106			7114		

## ATORN® Spiral flute chamfer milling cutter



- For roughing
- 15°, 30°, 40°, 45°, 60°, 75°
- For ISO milling inserts, type AP.. 1003
- **Internal coolant supply**
- Ideal for pre-machining welded seams
- Manufacturing and indexable insert tolerances allow crank formation
- Supplied with clamping screws and wrench
- **Additional versions with user-defined chamfer angles are manufactured on request (minimum purchase 2 units)**



D mm	D max. mm	D1 mm	L mm	γ °	H mm	Z eff.	Z	Tightening torque max. N-m			art.no.	€
17.0	70.0	22	50	15	7	3	9	1.0	A1	B1	<b>262531 1715</b>	<b>629,-</b>
17.0	69.0	22	50	20	9	3	9	1.0	A1	B1	262531 1720	<b>629,-</b>
17.0	65.0	22	50	30	13	3	9	1.0	A1	B1	262531 1730	<b>629,-</b>
17.0	60.0	22	50	40	17	3	9	1.0	A1	B1	262531 1740	<b>629,-</b>
17.0	56.0	22	50	45	19	3	9	1.0	A1	B1	262531 1745	<b>629,-</b>
17.0	45.0	16	50	60	24	3	9	1.0	A1	B2	262531 1760	<b>629,-</b>
19.0	33.0	16	60	75	27	3	9	1.0	A1	B2	262531 1975	<b>629,-</b>

2125

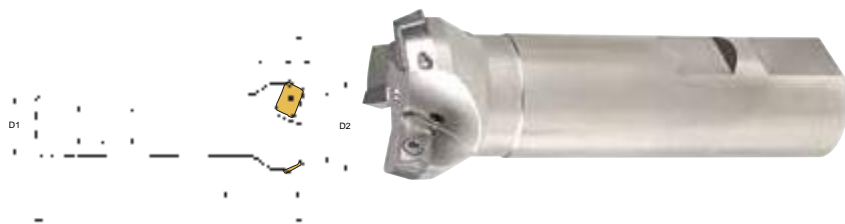
### Spare parts

Screw			Retaining screw			TORX		
art.no.	€		art.no.	€		art.no.	€	
A1 262551 0025	<b>5,45</b>		B1 320901 2509	<b>45,70</b>		C1 703053 0080	<b>1,93</b>	
3106			B2 320901 2510	<b>45,70</b>		7114		

## ATORN® 75° end / face milling cutter



- With Weldon shank
- **For ISO milling inserts, type AP..1003**
- Also ideal for indexable inserts that are already worn from use in 90° shoulder milling cutters or 90° end milling cutters. Worn inserts can be reused by utilising the unworn cutting edges.
- Supplied with clamping screws and wrench



D mm	D2 mm	D1 mm	L1 mm	L mm	Z	P mm	Tightening torque max. N-m			art.no.	€
25	28.6	20	25	95	2	4	1.0	A1	B1	262532 0025	197,50
32	35.6	25	25	95	3	4	1.0	A1	B1	262532 0032	250,-
40	43.6	25	25	100	4	4	1.0	A1	B1	262532 0040	305,-
2124											

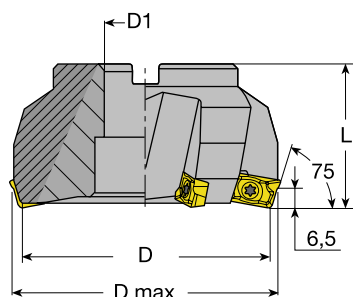
### Spare parts

Screw			TORX		
	art.no.	€	art.no.	€	
A1	262551 0025	5,45	B1	703053 0080	1,93
3106			7114		

## ATORN® 75° face milling cutter



- **For ISO milling inserts, type AP..1003**
- Also ideal for indexable inserts that are already worn from use in 90° shoulder milling cutters or 90° end milling cutters. Worn inserts can be reused by utilising the unworn cutting edges.
- Supplied with clamping screws and wrench



D mm	D1 mm	D max. mm	L mm	Z	Tightening torque max. N-m			art.no.	€
50.0	22	54	40	5	1.0	A1	B1	262533 0050	285,-
63.0	22	67	40	6	1.0	A1	B1	262533 0063	316,-
2124									

### Spare parts

Screw			TORX		
	art.no.	€	art.no.	€	
A1	262551 0025	5,45	B1	703053 0080	1,93
3106			7114		

### APKT 10 PDS-R

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	•	•	•				PH 7930	10	281514 1051 10,95
<p>Universal application</p> <p style="color: red; font-weight: bold; font-size: 1.2em;">Universal insert</p>												

2170

ISO	PH 7930
ISO P steel	Vc = 120 - 180
ISO M stainless steel	Vc = 70 - 150
ISO K cast iron	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length

### APKT


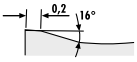
F finishing	M medium	R roughing	uracarb	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	•	•	•				DC 9235	10	281513 1049 12,95
<p>Universal application</p>												

2167

ISO	DC 9235
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length


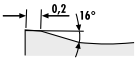


**APKT**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
			ISO designation										
 Universal application 	APKT 1003 PDER-S			●		●				HC 4615	10 281514 3005	9,95	
				●	●						HC 4535	10 281514 3007	9,95
				●	●	●						HC 4635	10 281514 3009



2129

**APKT**

F finishing	M medium	R roughing	<b>SARA®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€				
			ISO designation													
 Universal application 	APKT 1003-PDER-HCT			●						SP 35 PM	10 281519 1010	9,15				
				APKT 1003-PDER-SCT				●						SP 35 MM	10 281519 1020	9,15
										●				SP 35 SM	10 281519 1030	9,15

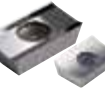

2167

**APKR specially for non-ferrous metals**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
 Universal application 	APKT 1003 PDFR						●			HW 4415	10 281715 0025	16,-


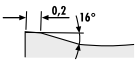
2129

**APHX specially for non-ferrous metals**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
 Universal application 	APHX 100304 FR-ALU						●			HW 4415	10 281517 2003	15,80
				<b>Polished design!</b>								

2129

**APKT Radius**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
			ISO designation										
 Universal application 	APKT 100308 PDER			●	●	●				HC 4540	10 281514 4011	12,95	
	APKT 100312 PDER			●	●	●					HC 4540	10 281514 4012	12,95
	APKT 100320 PDER			●	●	●					HC 4540	10 281514 4013	12,95

2129

ISO	HC 4535	HC 4615	HC 4635
ISO P steel	Vc = 100 - 170	Vc = 180 - 280	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130		Vc = 90 - 160
ISO K cast iron		Vc = 160 - 270	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length		

ISO	SP 35 MM	SP 35 PM	SP 35 SM
ISO P steel		Vc = 60 - 220	
ISO M stainless steel	Vc = 60 - 200		
ISO S superalloys			Vc = 25 - 75
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.08 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length		

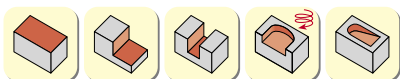
ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

ISO	HC 4540
ISO P steel	Vc = 70 - 130
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

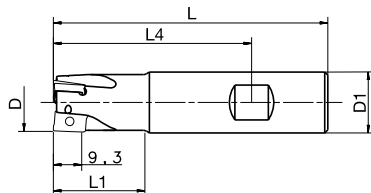


## SARA® 90° end milling cutter



- For ISO milling inserts, type AP.. 1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° corner milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench

**The affordable alternative**

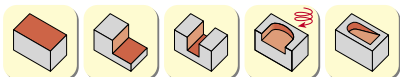


D mm	D1 h6 mm	L mm	L1 mm	L4 mm	Z	Tightening torque max. N-m			art.no.	€
16	16	85	37	60	2	1.2	A1	B1	262556 0016	78,40
20	20	90	40	65	3	1.2	A1	B1	262556 0020	104,50
25	25	105	49	70	4	1.2	A1	B1	262556 0025	122,-
2118										

### Spare parts

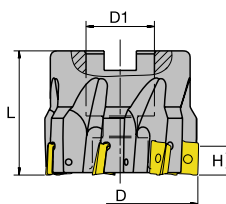
Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025	5,45	B1	703053 0080	1,93
3106			7114		

## SARA® 90° corner milling cutter



- For ISO milling inserts, type AP.. 1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm

**The affordable alternative**


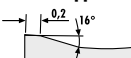


D mm	D1 H7 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
40	16	40	6	1.2	A1	B1	262557 0040	155,50
50	22	40	7	1.2	A1	B1	262557 0050	167,-
2118								

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025	5,45	B1	703053 0080	1,93
3106			7114		

### APMT 10

F finishing	M medium	R roughing	SARA®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
•	•	•	ISO designation							SC 4635	10	281516 3009	6,65
 <p>Universal application</p> 													

2167

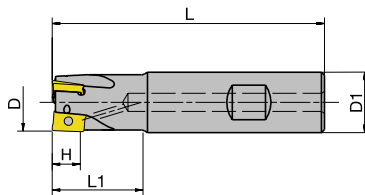
ISO	SC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 per cutting edge ap = max. 0.7 x cutting edge length

palbit 90° LINEPRO 18090 end milling cutter

NEW



- For ISO milling inserts AP.. 1604
- Easy cutting action thanks to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- Precise 90° corner milling
- Rhombic shape for large cutting depths
- For groove milling and side milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench



D mm	D1 h6 mm	L mm	L1 mm	H mm	Z	Tightening torque max. N-m			art.no.	€
25	25	100	44	14.9	2	3.0	A1	B1	260262 0025	149,50
25	25	200	60	14.9	2	3.0	A1	B1	260262 0026	243,-
32	32	110	50	14.9	3	3.0	A1	B1	260262 0032	163,-
32	32	200	60	14.9	3	3.0	A1	B1	260262 0033	297,-
40	32	115	40	14.9	4	3.0	A1	B1	260262 0040	203,-
40	32	200	40	14.9	4	3.0	A1	B1	260262 0041	350,-

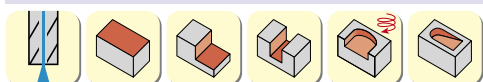
2174

Spare parts

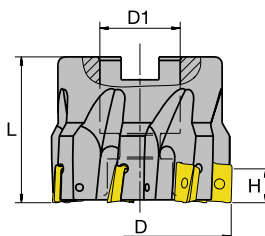
Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0014	4,07	B1	703053 0150	1,93
	3160			7114	

palbit Shoulder milling cutter 90° LINEPRO 18090

NEW



- For ISO milling inserts AP.. 1604
- Easy cutting action thanks to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- \* Without internal coolant supply
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- Precise 90° corner milling
- Rhombic shape for large cutting depths
- Supplied with clamping screws and wrench
- **Cutting angle:** Tool cutting edge angle 90°, axial rake angle 7° + 13°, radial rake angle 20°



D mm	D1 H7 mm	L mm	H mm	Z	Tightening torque max. N-m			art.no.	€
40	16	40	14.9	4	3.0	A1	B1	260263 0040	219,-
50	22	40	14.9	5	3.0	A1	B1	260263 0050	279,-
63	22	40	14.9	6	3.0	A1	B1	260263 0063	321,-
80	27	50	14.9	7	3.0	A1	B1	260263 0080	355,-
100	32	50	14.9	8	3.0	A1	B1	260263 0100	445,-
125	40	63	14.9	9	3.0	A1	B1	260263 0125	519,-

2174

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0014	4,07	B1	703053 0150	1,93
	3160			7114	

APKT 1604-PDR

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	APKT 1604 PDR	•	•	•				PH 7930	10 285440 0151	14,20
<p>Universal application</p> <p style="color: red; font-weight: bold; font-size: 1.2em;">Universal insert</p>												

2170

ISO	PH 7930
ISO P steel	Vc = 120 - 180
ISO M stainless steel	Vc = 70 - 150
ISO K cast iron	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length

Continued on next page >>>

**APKT 1604-PDER-X1**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	●		●				PH 6920	10 285328 0142	11,10
<p>Universal application</p>			APKT 160408 PDER-X1									

2170

ISO	PH 6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length

**1604-PDER-X2**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€													
•	•	•	ISO designation	●		●				PH 7920	10 285329 0250	11,10													
<p>Universal application</p>			APKT 160408 PDER-X2																						
			<table border="1"> <tr> <td>○</td> <td>●</td> <td>○</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PH 7930</td> <td>10 285329 0251</td> <td>11,10</td> </tr> </table>										○	●	○								PH 7930	10 285329 0251	11,10
○	●	○								PH 7930	10 285329 0251	11,10													

2170

ISO	PH 7920	PH 7930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO M stainless steel		Vc = 70 - 150
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length	

**APKT 1604-PDSR-X1**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€													
•	•	•	ISO designation	●		●				PH 6920	10 285330 0342	11,10													
<p>Universal application</p>			APKT 160408 PDSR-X1																						
			<table border="1"> <tr> <td>○</td> <td></td> <td>○</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PH 6930</td> <td>10 285330 0343</td> <td>11,10</td> </tr> </table>										○		○								PH 6930	10 285330 0343	11,10
○		○								PH 6930	10 285330 0343	11,10													

2170

ISO	PH 6920	PH 6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	

**APKT 1604-PDSR-X2**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€													
•	•	•	ISO designation	●		●				PH 7920	10 285331 0450	11,10													
<p>Universal application</p>			APKT 160408 PDSR-X2																						
			<table border="1"> <tr> <td>○</td> <td></td> <td>○</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PH 7930</td> <td>10 285331 0451</td> <td>11,10</td> </tr> </table>										○		○								PH 7930	10 285331 0451	11,10
○		○								PH 7930	10 285331 0451	11,10													

2170

ISO	PH 7920	PH 7930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	

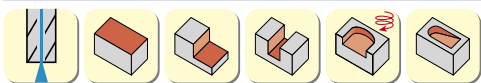
**APKT 1604-PDSR-X**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	●		●				PH 6920	10 285333 0642	11,10
<p>Universal application</p>			APKT 160416 PDSR-X									

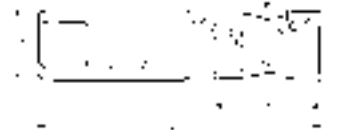
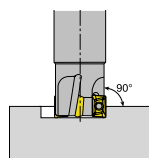
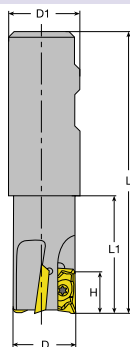
2170

ISO	PH 6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length

## ATORN® 90° end milling cutter



- For ISO milling inserts, type AP.. 1604
- Internal coolant supply
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° shoulder milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench



### Short

D mm	D1 mm	L1 mm	H mm	L mm	Z	Tightening torque max. N-m			art.no.	€
25.0	25	44	14.9	100	2	4.01	A1	B1	262505 0025	163,-
32.0	32	50	14.9	110	3	4.01	A1	B1	262505 0032	184,50
40.0	32	45	14.9	115	4	4.01	A1	B1	262505 0040	216,-

2124



262505 0025



262505 0032



### Long

D mm	D1 mm	L1 mm	H mm	L mm	Z	Tightening torque max. N-m			art.no.	€
25.0	25	140	14.9	200	2	4.01	A1	B1	262510 0025	255,-
32.0	32	140	14.9	200	3	4.01	A1	B1	262510 0032	290,-
40.0	32	60	14.9	200	4	4.01	A1	B1	262510 0040	370,-

2124



### Roughing spiral flute end mill

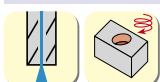
D mm	D1 mm	L mm	H mm	Z eff.	Z	Tightening torque max. N-m			art.no.	€
25.0	25	105	29	1	2	4.01	A1	B1	262511 0025	405,-
32.0	32	115	44	2	6	4.01	A1	B1	262511 0032	539,-
40.0	32	130	58	2	8	4.01	A1	B1	262511 0040	629,-

2124

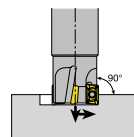
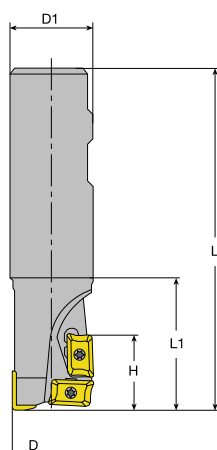
### Spare parts

	Screw			Wrench	
	art.no.	€		art.no.	€
A1	320901 2502	11,65	B1	705141 0015	6,35
		3106			7114

## ATORN® 90° drilling/die sinking cutter



- For ISO milling inserts, type AP.. 1604
- Internal coolant supply
- With Weldon shank
- High cutting capacity
- Reliable chip flow even when drilling due to positive indexable insert geometry
- Supplied with clamping screws and wrench



### Short

D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
32.0	32	30	50	130	3	4.01	A1	B1	262515 0004	315,-

2124

### Extra-long

D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
32.0	32	30	160	220	3	4.01	A1	B1	262516 0004	370,-

2124

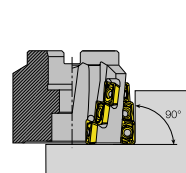
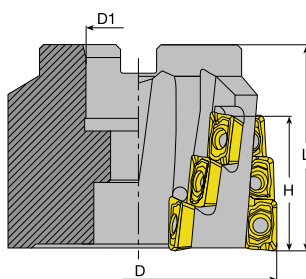
### Spare parts

	Screw			Wrench	
	art.no.	€		art.no.	€
A1	320901 2502	11,65	B1	705141 0015	6,35
		3106			7114

## ATORN® 90° roughing spiral flute milling cutter



- For ISO milling inserts, type AP.. 1604
- Just one insert type for both face and side cutting edges
- High right-hand helix configuration for good chip shaping
- Full coverage within one row of teeth
- Supplied with clamping screws and wrench



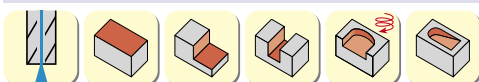
D mm	D1 mm	H mm	L mm	Z eff.	Z	Tightening torque max. N-m			art.no.	€
50.0	27	30	50	3	6	4.01	A1	B1	262523 0050	470,-
63.0	27	44	60	4	12	4.01	A1	B1	262523 0063	639,-
80.0	32	44	60	5	15	4.01	A1	B1	262523 0080	909,-
100.0	40	44	60	6	18	4.01	A1	B1	262523 0100	1.149,-

2124

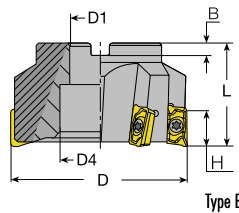
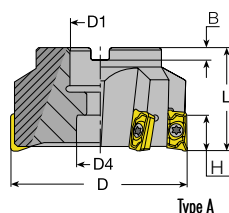
### Spare parts

Screw			Wrench		
	art.no.	€		art.no.	€
A1	320901 2502	11,65	B1	705141 0015	6,35
	3106			7114	

## ATORN® 90° shoulder milling cutter



- For ISO milling inserts, type AP.. 1604
- Precise 90° shoulder milling
- Rhombic shape for large cutting depths
- Internal coolant supply
- Supplied with clamping screws and wrench
- **Cutting angle:** Tool cutting edge angle 90°, axial rake angle 7° + 13°, radial rake angle 20°
- \* Without internal coolant supply



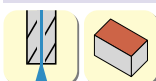
Type	D mm	D1 mm	L mm	D4 mm	B mm	Z	Tightening torque max. N-m			art.no.	€
A	40.0	16	40	12.0	5.6	4	4.01	A1	B1	262525 0040	207,-
A	50.0	22	40	18.0	6.3	5	4.01	A1	B1	262525 0050	229,-
A	63.0	22	40	18.0	6.3	6	4.01	A1	B1	262525 0063	260,-
A	80.0	27	50	20.0	7	7	4.01	A1	B1	262525 0080	336,-
B	100.0	32	50	45.0	8	8	4.01	A1	B1	262525 0100	425,-
B	125.0	40	63	56.0	9	9	4.01	A1	B1	262525 0125	499,-
B*	160.0	40	63	87.0	9	10	4.01	A1	B1	262525 0160	689,-
B*	200.0	60	63	87.0	9	13	4.01	A1	B1	262525 0200	929,-
B*	250.0	60	63	87.0	9	16	4.01	A1	B1	262525 0250	1.529,-

2124

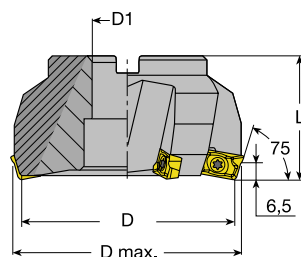
### Spare parts

Screw			Wrench		
	art.no.	€		art.no.	€
A1	320901 2502	11,65	B1	705141 0015	6,35
	3106			7114	

## ATORN® 75° face milling cutter



- For ISO milling inserts, type AP..1604
- Also ideal for indexable inserts that are already worn from use in 90° shoulder milling cutters or 90° end milling cutters. Worn inserts can be reused by utilising the unworn cutting edges.
- Supplied with clamping screws and wrench



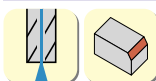
D mm	D1 mm	D max. mm	L mm	Z	Tightening torque max. N-m			art.no.	€
50.0	16	54	40	3	4.01	A1	B1	262530 0050	176,-
63.0	22	67	40	4	4.01	A1	B1	262530 0063	229,-
80.0	27	84	50	5	4.01	A1	B1	262530 0080	250,-
100.0	32	104	50	6	4.01	A1	B1	262530 0100	305,-
125.0	40	129	63	7	4.01	A1	B1	262530 0125	355,-

2124

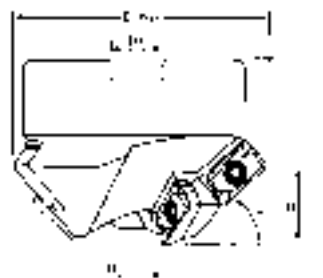
### Spare parts

Screw			Wrench		
	art.no.	€		art.no.	€
A1	320901 2502	11,65	B1	705141 0015	6,35
	3106			7114	

## ATORN® Spiral flute chamfer milling cutter



- For roughing
- 15°, 30°, 40°, 45°, 60°, 75°
- For ISO milling inserts, type AP.. 1604
- Ideal for pre-machining welded seams
- Indexable insert tolerances allow crank formation
- Supplied with clamping screws and wrench
- Additional versions with user-defined chamfer angles are manufactured on request (minimum purchase 2 units)



D mm	D max. mm	D1 mm	L mm	γ°	H mm	Z eff.	Z	Tightening torque max. N-m			art.no.	€
35.0	94.0	27	50	15	8	3	6	4.01	A1	B1	262527 3515	549,-
35.0	91.0	27	50	20	10	3	6	4.01	A1	B1	262527 3520	549,-
35.0	88.0	27	50	30	15	3	6	4.01	A1	B1	262527 3530	549,-
35.0	84.0	27	50	40	19	3	6	4.01	A1	B1	262827 3540	549,-
35.0	77.8	27	50	45	21.5	3	6	4.01	A1	B1	262527 3545	549,-
35.0	65.0	27	50	60	26.5	3	6	4.01	A1	B1	262527 3560	549,-
35.0	50.7	22	60	75	29.5	3	6	4.01	A1	B1	262527 3575	549,-

2125

### Spare parts

Screw			Wrench		
art.no.	€		art.no.	€	
A1 320901 2502	11,65		B1 705141 0015	6,35	
	3106			7114	

### APKT 1604-PDR

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	APKT 1604 PDR	•	•	•				PH 7930	10 285440 0151	14,20
<p>Universal application</p> <p style="color: red; font-weight: bold; font-size: 1.2em;">Universal insert</p>												

2170

ISO	PH 7930
ISO P steel	Vc = 120 - 180
ISO M stainless steel	Vc = 70 - 150
ISO K cast iron	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length

### APKT

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	APKT 1604 PD-R-7	•	•	•				DC 9235	10 281520 6949	17,80
<p>Universal application</p>												

2167

ISO	DC 9235
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

### APKT


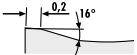
F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
•	•	•	APKT 1604 PDER-S	•	•	•				HC 4615	10 281514 3205	11,30	
<p>Universal application</p>													
											HC 4535	10 281514 3207	11,30
											HC 4635	10 281514 3209	11,30

2129

ISO	HC 4535	HC 4615	HC 4635
ISO P steel	Vc = 100 - 170	Vc = 180 - 280	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130		Vc = 90 - 160
ISO K cast iron		Vc = 160 - 270	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length		

Continued on next page >>>



**APKT**

F finishing	M medium	R roughing	<b>SARA®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
			ISO designation										
 <b>Universal application</b> 	APKT 1604-PDER-HCT			●						SP 35 PM	10 <b>281519 1610</b>	<b>10,70</b>	
	APKT 1604-PDER-SCT				●						SP 35 MM	10 281519 1620	<b>10,70</b>
								●			SP 35 SM	10 281519 1630	<b>10,70</b>

2167

ISO	SP 35 MM	SP 35 PM	SP 35 SM
ISO P steel		Vc = 60 - 220	
ISO M stainless steel	Vc = 60 - 200		
ISO S superalloys			Vc = 25 - 75
Vc = [m/min] fz = [mm/Z] ap = [mm]	ap = max. 0.7 x cutting edge length	fz = 0.08 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	



**APKR specially for non-ferrous metals**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
 <b>Universal application</b> 	APKT 1604 PDRF						●			HW 4415	10 <b>281715 0030</b>	<b>17,60</b>

2129

ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

**APHX specially for non-ferrous metals**


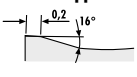
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
 <b>Universal application</b> 	APHX 160404 FR-ALU						●			HW 4415	10 <b>281517 2203</b>	<b>17,80</b>

**Polished design!**

2129

ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

**APKT Radius**

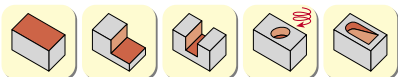
F finishing	M medium	R roughing	<b>SARA®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
			ISO designation										
 <b>Universal application</b> 	APKT 160416-PDER-HCM			●	●	●				SP 35 P	10 <b>281522 1610</b>	<b>14,50</b>	
	APKT 160424-PDER-HCM			●	●	●					SP 35 P	10 281522 2410	<b>14,50</b>
	APKT 160432-PDER-HCM			●	●	●					SP 35 P	10 281522 3210	<b>14,50</b>
	APKT 160448-PDER-HCM			●	●	●					SP 35 P	10 281522 4810	<b>14,50</b>

2167

ISO	SP 35 P
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] f = [mm/U] ap = [mm]	fz = 0.1 - 0.4 ap = max. 0.7 x cutting edge length

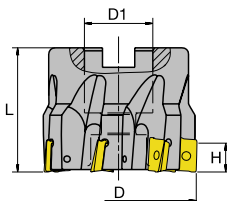


## SARA® Shoulder milling cutter 90°



- For ISO milling inserts AP.. 1604
- Soft cutting due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm

**The affordable alternative**




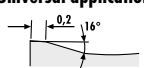
D mm	D1 H7 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
40	16	40	4	4.01	A1	B1	262558 0040	122,50
50	22	40	5	4.01	A1	B1	262558 0050	146,-
63	22	40	6	4.01	A1	B1	262558 0063	157,-

2118

### Spare parts

Screw		Wrench	
art.no.	€	art.no.	€
A1 320901 2502	11,65	B1 705141 0015	6,35
3106		7114	

### APMT 16

F finishing	M medium	R roughing	SARA®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	•	•	•				SC 4635	10 281517 3009	8,10
 <p>Universal application</p> 			APMT 1604 PDER-M									

2167

ISO	SC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 per cutting edge ap = max. 0.7 x cutting edge length

THE COMPLETE

# MACHINING RANGE





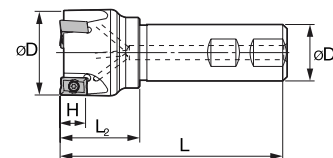
**PALBIT**  
Machining tools  
411 pages  
Art.no. 019900 0315

Overview of all free manufacturers' catalogues on page 16/17

## ATORN® End milling cutters 4-10 Power



- For ISO milling inserts, type LN.X 100605 PNR
- Internal coolant supply
- For face milling, shoulder milling, straight-line edge milling and groove milling
- Multi-functional milling tool system with **4 cutting edges** on a **double-sided indexable cutting insert**
- High tool life quantities due to low machining forces
- Special chip shape geometry allows low power consumption due to a large rake angle despite the thick cutting edge
- With the new carbide types, the chip geometry ensures consistently high tool life quantities
- Nickel-plated design for high wear-resistance and increased base body service life



### Short

D mm	D1 mm	L mm	L2 mm	H mm	Z	Tightening torque max. N-m			art.no.	€
20.0	20	100	30	9	3	1.75	A1	C1	262559 0020	208,-
25.0	25	115	35	9	3	1.75	A1	C1	262559 0025	260,-
32.0	25	125	40	9	4	1.75	A1	C1	262559 0032	285,-

2124



### Long

D mm	D1 mm	L mm	L2 mm	H mm	Z	Tightening torque max. N-m			art.no.	€
20	20	150	50	9	3	1.75	A1	B1	262561 0020	217,-
25	25	150	50	9	3	1.75	A1	B1	262561 0025	263,-
32	32	200	60	9	4	1.75	A1	B1	262561 0032	290,-

2124

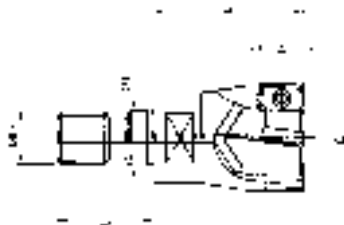
### Spare parts

Screw		TORX		TORX PLUS	
art.no.	€	art.no.	€	art.no.	€
A1 285799 0102	8,-	B1 703053 0090	1,93	C1 703054 0080	2,24
3106		7114		7114	

## ATORN® Screw-in milling cutter 4-10 Power



- For ISO milling inserts, type LN.X 100605 PNR
- Internal coolant supply
- For face milling, shoulder milling, straight-line edge milling and groove milling
- Multi-functional milling tool system with **4 cutting edges** on a **double-sided indexable cutting insert**
- High tool life quantities due to low machining forces
- Special chip shape geometry allows low power consumption due to a large rake angle despite the thick cutting edge
- With the new carbide types, the chip geometry ensures consistently high tool life quantities
- Nickel-plated design for high wear-resistance and increased base body service life



D mm	L mm	Z	D1 mm	H mm	L1 mm	MD	Tightening torque max. N-m			art.no.	€
20	30	3	10.5	9	20	M10	1.75	A1	B1	262563 0020	205,-
25	35	3	12.5	9	22	M12	1.75	A1	B1	262563 0025	244,-
32	43	4	17	9	24	M16	1.75	A1	B1	262563 0032	265,-

2124

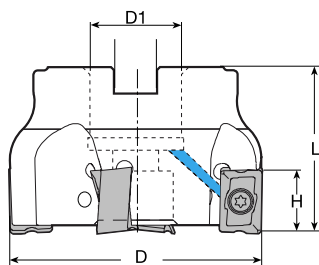
### Spare parts

Screw		TORX	
art.no.	€	art.no.	€
A1 285799 0102	8,-	B1 703053 0090	1,93
3106		7114	

# ATORN® Shoulder milling cutter 4-10 power / 4-15 power



- Internal coolant supply
- For face milling, shoulder milling, straight-line edge milling and groove milling
- Multi-functional milling tool system with **4 cutting edges** on a **double-sided milling insert**
- High tool life quantities due to low machining forces.
- Special chip shape geometry allows low power consumption due to a large rake angle despite the thick cutting edge
- With the new carbide types, the chip geometry ensures consistently high tool life quantities
- Nickel-plated design for high wear-resistance and increased base body service life



## 4-10 Power

- For ISO milling inserts, type LN.X 100605 PNR

D mm	D1 mm	L mm	H mm	Z	Tightening torque max. N-m			art.no.	€
40.0	16	40	9	5	1.75	A1	B1	262560 0040	338,-
50.0	22	40	9	7	1.75	A1	B1	262560 0050	375,-
63.0	22	40	9	9	1.75	A1	B1	262560 0063	460,-

2124

## 4-15 Power

- For ISO milling inserts, type LN.X 151008 PNR

D mm	D1 mm	L mm	H mm	Z	Tightening torque max. N-m			art.no.	€
50.0	22	40	14	5	4.01	A2	B2	262562 0050	305,-
63.0	22	40	14	6	4.01	A2	B2	262562 0063	336,-
80.0	27	50	14	7	4.01	A2	B2	262562 0080	365,-
100.0	32	50	14	8	4.01	A2	B2	262562 0100	435,-
125.0	40	63	14	10	4.01	A2	B2	262562 0125	789,-
160.0	40	63	14	11	4.01	A2	B2	262562 0160	979,-

2124



## Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 285799 0102	8,-		B1 703053 0090	1,93	
A2 285799 0103	8,-		B2 703053 0150	1,93	

3106

7114

## LNM(E)X 10

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation									
 Universal application			LNMX 100605 PNR-MM	●	●	●				HC 4630	10 295811 0001	15,40
					●					HC 4535	10 295813 0001	15,40
						●				HW 4310	10 295815 0002	14,35

2129

## LNM(E)X 15

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation									
 Universal application			LNMX 151008 PNR-MM	●	●	●				HC 4630	10 295821 0001	18,95
					●					HC 4535	10 295825 0001	18,95
						●				HW 4310	10 295826 0002	18,45

2129

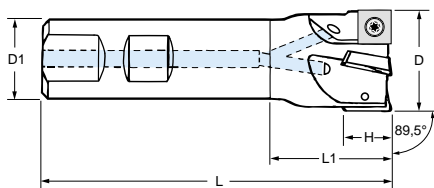
ISO	HC 4535	HC 4630	HW 4310
ISO P steel		Vc = 110 - 220	
ISO M stainless steel	Vc = 120 - 180	Vc = 90 - 160	
ISO K cast iron		Vc = 120 - 230	
ISO N Al/non-ferrous			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z] ap = [mm]		fz = 0.05 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length	

ISO	HC 4535	HC 4630	HW 4310
ISO P steel		Vc = 110 - 220	
ISO M stainless steel	Vc = 120 - 180	Vc = 90 - 160	
ISO K cast iron		Vc = 120 - 230	
ISO N Al/non-ferrous			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z] ap = [mm]		fz = 0.05 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length	

## ATORN® 89.5° end milling cutter



- For milling inserts SP.T 0603
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surfaces
- Burr-free milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Supplied with clamping screw and wrench



Particularly cost-effective thanks to 4 cutting edges



### Short

D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
10	16	6	24	80	1	1.0	A1	B1	265000 0010	96,20
12	16	6	24	80	1	1.0	A1	B1	265000 0012	96,20
16	16	6	37	85	2	1.0	A1	B1	265000 0016	128,50
20	20	6	40	90	3	1.0	A1	B1	265000 0020	167,-
25	25	6	39	95	4	1.0	A1	B1	265000 0025	204,-
32	25	6	30	95	5	1.0	A1	B1	265000 0032	227,-

2124

### Long

D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
16	16	6	100	150	2	1.0	A1	B1	265001 0016	147,50
20	20	6	100	150	3	1.0	A1	B1	265001 0020	202,-
25	20	6	25	150	4	1.0	A1	B1	265001 0025	227,-
32	25	6	30	150	5	1.0	A1	B1	265001 0032	265,-

2124

### Spare parts

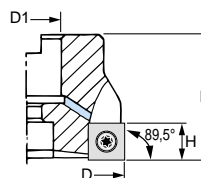
Screw		TORX	
art.no.	€	art.no.	€
A1 262551 0025	5,45	B1 703053 0080	1,93
3106		7114	

## ATORN® 89.5° shell-type milling cutter



- For milling inserts SP.T 0603
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surfaces
- Burr-free milling
- **Internal coolant supply**
- Supplied with clamping screw and wrench

Particularly cost-effective thanks to 4 cutting edges



D mm	L mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
40	40	16	6	6	1.0	A1	B1	265002 0040	260,-
50	40	22	7	6	1.0	A1	B1	265002 0050	308,-
63	40	22	8	6	1.0	A1	B1	265002 0063	420,-

2124

### Spare parts

Screw		TORX	
art.no.	€	art.no.	€
A1 262551 0025	5,45	B1 703053 0080	1,93
3106		7114	

### SPMT

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	○	○	ISO designation	●	●	●				HC 4635	10 263008 0006	11,40
Finishing/medium machining			SPMT 060304									

2131

### SPGT ALU

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	○	ISO designation				●			HW 4415	10 263009 0006	13,45
Universal application			SPGT 060304 ALU									

2131

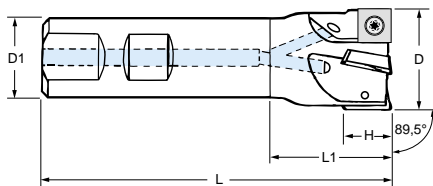
ISO	HC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.15 ap = 0.5 - 4.0

ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.20 ap = 0.5 - 2.0

## ATORN® 89.5° end milling cutter



- For milling inserts SP.T 09T3
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surfaces
- Burr-free milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Supplied with clamping screw and wrench



**Particularly cost-effective thanks to 4 cutting edges**



D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
25	25	9	44	100	2	2.68	A1	B1	265003 0025	168,-
32	32	9	50	110	3	2.68	A1	B1	265003 0032	192,50
40	32	9	45	115	4	2.68	A1	B1	265003 0040	244,-

2124

### Spare parts

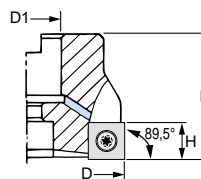
Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0035	7,95	B1	703053 0150	1,93
	3106			7114	

## ATORN® 89.5° shell-type milling cutter



- For milling inserts SP.T 09T3
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surfaces
- Burr-free milling
- **Internal coolant supply**
- Supplied with clamping screw and wrench

**Particularly cost-effective thanks to 4 cutting edges**



D mm	L mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
40	40	16	4	9	2.68	A1	B1	265004 0040	222,-
50	40	22	5	9	2.68	A1	B1	265004 0050	244,-
63	40	22	6	9	2.68	A1	B1	265004 0063	286,-
80	50	27	7	9	2.68	A1	B1	265004 0080	313,-
100	50	32	8	9	2.68	A1	B1	265004 0100	390,-

2124

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0035	7,95	B1	703053 0150	1,93
	3106			7114	

### SPMT

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	ISO designation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	HC 4635	10 263008 0009	12,30
<p>Finishing/medium machining</p>			SPMT 09T308	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			

2131

### SPGT ALU

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	ISO designation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	HW 4415	10 263009 0009	14,45
<p>Universal application</p>			SPGT 09T308 ALU	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>			

2131

ISO	HC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.18 ap = 0.5 - 4.0

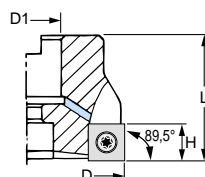
ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.20 ap = 0.5 - 2.0

## ATORN® 89.5° shell-type milling cutter



- for milling inserts SP.T 1204
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surface quality
- Burr-free milling cutter
- **Internal coolant supply**
- Supplied with clamping screw and wrench

Particularly cost-effective thanks to 4 cutting edges




D mm	L mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
50	40	22	5	12	7.93	A1	B1	265005 0050	323,-
63	40	22	6	12	7.93	A1	B1	265005 0063	349,-
80	50	27	6	12	7.93	A1	B1	265005 0080	399,-
100	50	32	8	12	7.93	A1	B1	265005 0100	495,-
125	63	40	9	12	7.93	A1	B1	265005 0125	599,-

2124

### Spare parts

	Screw		TORX		
	art.no.	€	art.no.	€	
A1	321701 0108	9,75	B1	703053 0200	1,93
	3164			7114	


### SPMT

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	○	○	ISO designation									
 <p>Finishing/medium machining</p>			SPMT 120408	●	○	○				HC 4635	10 263008 0012	13,55

2131

ISO	HC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.2 ap = 0.5 - 4.0

### SPGT ALU

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	○	ISO designation									
 <p>Universal application</p>			SPGT 120408 ALU				●			HW 4415	10 263009 0012	15,50

2131

ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.20 ap = 0.5 - 2.0

Over 200,000 tools available online!

#### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages

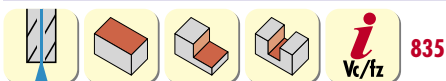


Register online now!

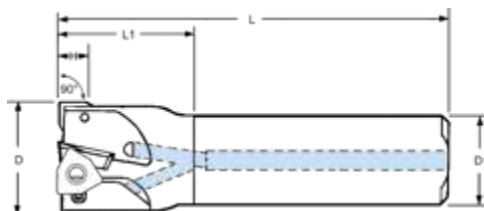
[www.saratools.com](http://www.saratools.com)



## ATORN® End milling cutter 90°



- For WNEU 403 milling inserts
- Wear-resistant, nickel-plated design
- Positive indexable insert basic form
- Very low power consumption thanks to special chip shape geometry
- Six cutting edges per indexable insert
- Double-sided indexable insert
- Large insert thickness
- **Internal coolant supply**
- Supplied with clamping screw and wrench



### Short version

D mm	L mm	L1 mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
20	90	40	20	3	4	1.2	A1	B1	262566 0020	185,50
25	100	44	25	4	4	1.2	A1	B1	262566 0025	224,-
32	110	50	32	5	4	1.2	A1	B1	262566 0032	245,-

2124

### Long version

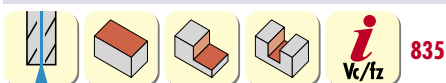
D mm	L mm	L1 mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
20	150	40	20	3	4	1.2	A1	B1	262567 0020	217,-
25	170	50	25	4	4	1.2	A1	B1	262567 0025	260,-
32	195	70	32	5	4	1.2	A1	B1	262567 0032	301,-

2124

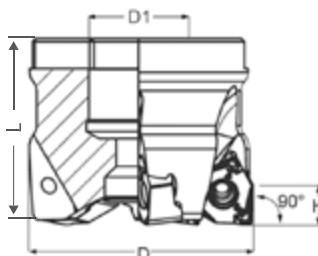
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 2551	5,70	B1	703053 0080	1,93
3106			7114		

## ATORN® Shoulder milling cutter 90°



- For WNEU 403 milling inserts
- Wear-resistant, nickel-plated design
- Positive indexable insert basic form
- Very low power consumption thanks to special chip shape geometry
- Six cutting edges per indexable insert
- Double-sided indexable insert
- Large insert thickness
- **Internal coolant supply**
- Supplied with clamping screw and wrench



D mm	L mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
32	40	16	6	4	1.2	A1	B1	262568 0032	277,-
40	40	16	6	4	1.2	A1	B1	262568 0040	290,-
50	40	22	8	4	1.2	A1	B1	262568 0050	311,-

2124

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 2551	5,70	B1	703053 0080	1,93
3106			7114		

## ATORN® Milling inserts MNEU 04

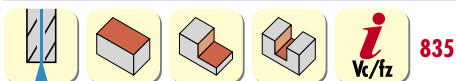


ISO designation	ISO <b>PK</b>		ISO <b>PM</b>		ISO <b>PMK</b>	
		Coated HC4620 art.no. €		Coated HC4630 art.no. €		Coated HC4430 art.no. €
WNEU 040304-M	10	295830 0002 19,05	10	295831 0002 19,05	10	295832 0002 19,05
WNEU 040308-M	10	295830 0001 19,05	10	295831 0001 19,05	10	295832 0001 19,05
		2131		2131		2131

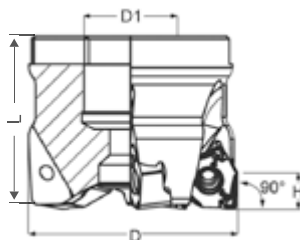




## ATORN® 90° corner milling cutter



- For WNE.. 0806 milling inserts
- Wear-resistant, nickel-plated design
- Positive indexable insert basic form
- Very low power consumption thanks to special chip shape geometry
- Six cutting edges per indexable insert
- Double-sided indexable insert
- Large insert thickness
- **Internal coolant supply**
- Supplied with clamping screw and wrench



6 cutting edges

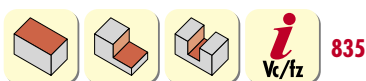


D mm	L mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
40	40	22	3	7	3.0	A1	B1	262565 0040	250,-
50	40	22	5	7	3.0	A1	B1	262565 0050	360,-
63	40	22	6	7	3.0	A1	B1	262565 0063	405,-
63	40	22	7	7	3.0	A1	B1	262565 1063	509,-
80	50	27	7	7	3.0	A1	B1	262565 0080	460,-
80	50	27	9	7	3.0	A1	B1	262565 1080	549,-
100	50	32	8	7	3.0	A1	B1	262565 0100	569,-
100	50	32	10	7	3.0	A1	B1	262565 1100	689,-
125	63	40	10	7	3.0	A1	B1	262565 0125	729,-
125	63	40	11	7	3.0	A1	B1	262565 1125	729,-
160	63	40	11	7	3.0	A1	B1	262565 0160	839,-
160	63	40	12	7	3.0	A1	B1	262565 1160	1.049,-
2124									

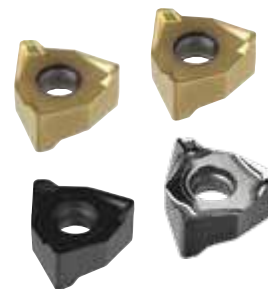
### Spare parts

Screw			TORX		
	art.no.	€	art.no.	€	
A1	262551 4035	5,70	B1	703053 0150	1,93
		3106			7114

## ATORN® Milling inserts WNE.. 08



ISO designation	ISO  Coated HC4620		ISO  Coated HC4630		ISO  Coated HC4430		ISO  Uncoated HW4415		
	art.no.	€	art.no.	€	art.no.	€	art.no.	€	
WNEX 080608-ALU							10	295833 0001	22,20
WNEX 080608-M	10	295827 0001	20,80	10	295828 0001	19,85	10	295829 0001	19,85
		2131		2131		2131		2131	



Ground sharp ...

... optimal chip control.

**ATORN®**  
Performance demands quality

## Tangential Milling Cutters

INFO

**• Process reliability due to tangential installation position**

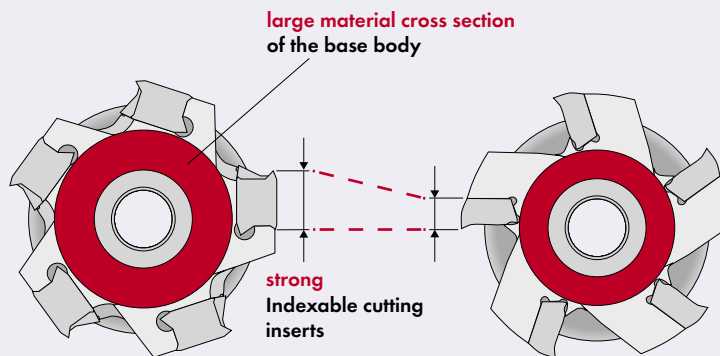
The tangential installation position of the indexable cutting inserts provides some special features. The favourable contact surface and clamping force conditions ensure maximum stability. The tools are therefore extremely reliable even at high cutting performance.

**• Efficiency due to good cutting properties**

The stable indexable cutting inserts have a positive rake angle, resulting in excellent cutting performance and low power consumption of the machine. This significantly increases the service life of the cutting edge. This has a direct and positive effect on tool costs.

**• Cost savings thanks to reduced cycle times**

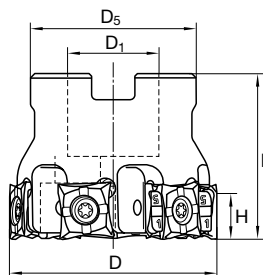
The ratio of tool diameter to the number of teeth, combined with high achievable feed rates, facilitates enormous removal rates. This results in significantly shorter cycle times, which considerably reduces the total process costs and cost per part.



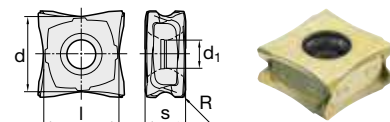
## ATORN® Tangential shoulder milling cutter 90°



- Process reliability due to tangential installation position
- **8-blade indexable insert for high efficiency**
- Efficiency due to good cutting properties
- Cost savings thanks to reduced cycle times
- For roughing and semi-finishing operations / steel and cast iron machining
- **Infeed depth ap max. = 10 mm**
- up to Ø 125 mm with internal cooling



D mm	L mm	D5 mm	D1 mm	H mm	Z	Tightening torque max. N-m	Designation	A1	B1	art.no.	€
50	40	40	22	10	5	5.2	FMP90T X12,050AN-I			262566 0050	380,-
50	40	40	22	10	6	5.2	FMP90T X12,050AN-IF			262566 0051	430,-
63	40	50	22	10	6	5.2	FMP90T X12,063AN-I			262566 0063	485,-
63	40	50	22	10	8	5.2	FMP90T X12,063AN-IF			262566 0064	549,-
80	50	60	27	10	8	5.2	FMP90T X12,080AN-I			262566 0080	599,-
80	50	60	27	10	10	5.2	FMP90T X12,080AN-IF			262566 0081	669,-
100	50	65	32	10	9	5.2	FMP90T X12,100AN-I			262566 0100	729,-
100	50	65	32	10	12	5.2	FMP90T X12,100AN-IF			262566 0101	809,-
125	63	90	40	10	11	5.2	FMP90T X12,125AN-I			262566 0125	839,-
125	63	90	40	10	16	5.2	FMP90T X12,125AN-IF			262566 0126	969,-
160	63	130	40	10	13	5.2	FMP90T X12,160AN			262566 0160	1.059,-
160	63	130	40	10	20	5.2	FMP90T X12,160AN-F			262566 0161	1.289,-



2127

**XNMU**

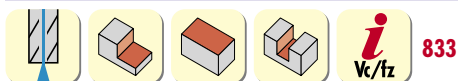
ISO designation	l mm	d mm	S mm	d1 mm	R mm	ISO <b>K</b>		ISO <b>P/K</b>		ISO <b>P</b>		ISO <b>M</b>	
						HC4420	€	HC4430	€	HC4640	€	HC4544	€
XNMU 120508ER	12	12	5.56	4.4	0.8	283320 0120	23,90	283321 0130	23,90	283322 0140	23,90	283323 0144	23,90
						2131		2131		2131		2131	

**Spare parts**

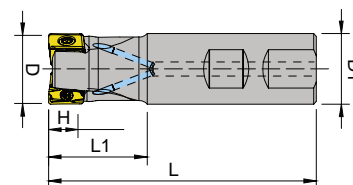
Screw			TORX		
art.no.	€		art.no.	€	
A1 264000 9906	4,84		B1 703053 0150	1,93	
3106			7114		

## palbit End milling cutter 90° TGPLUS 90190

NEW



- for milling inserts LNXT 1306..
- maximum stability thanks to tangentially-arranged indexable inserts
- high feed rates for maximum removal rate
- **internal coolant supply**



D mm	D1 mm	L mm	L1 mm	H mm	Z	Tightening torque max. N-m	Designation	art.no.	€
25	25	95	45	11	2	3.0	025W90190-02-04-025095	A1 B1	260248 0025 243,-
32	32	110	50	11	3	3.0	032W90190-03-04-032110	A2 B1	260248 0032 291,-
40	32	110	50	11	4	3.0	040W90190-04-04-032110	A2 B1	260248 0040 375,-

### Spare parts

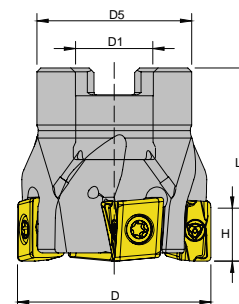
Screw		TORX	
art.no.	€	art.no.	€
A1 321099 0014	4,07	B1 703053 0150	1,93
A2 321099 0017	3,54		

## palbit Shoulder milling cutter 90° TGPLUS 90190

NEW



- for milling inserts LNXT 1306..
- maximum stability thanks to tangentially-arranged indexable inserts
- high feed rates for maximum removal rate
- **internal coolant supply**
- from Ø 80 mm special tightening screw for coolant



D mm	L mm	D5 mm	D1 mm	H mm	Z	Tightening torque max. N-m	Designation	art.no.	€
40	40	32	16	11	4	3.0	040A90190-04-04-016040	A1 C1	260247 0040 291,-
40	40	32	16	11	5	3.0	040A90190-05-04-016040	A1 C1	260247 0041 325,-
50	40	42	22	11	5	3.0	050A90190-05-04-022040	A1 C1	260247 0050 405,-
50	40	42	22	11	6	3.0	050A90190-06-04-022040	A1 C1	260247 0051 440,-
63	40	52	22	11	6	3.0	063A90190-06-04-022040	A1 C1	260247 0063 445,-
63	40	52	22	11	8	3.0	063A90190-08-04-022040	A1 C1	260247 0064 519,-
80	50	60	27	11	7	3.0	080A90190-07-04-027050	A1 B1 C1	260247 0080 529,-
80	50	60	27	11	10	3.0	080A90190-10-04-027050	A1 B1 C1	260247 0081 619,-
100	50	80	32	11	9	3.0	100A90190-09-04-032050	A1 B2 C1	260247 0100 669,-
100	50	80	32	11	13	3.0	100A90190-13-04-032050	A1 B2 C1	260247 0101 879,-
125	63	90	40	11	11	3.0	125A90190-11-04-040063	A1 B3 C1	260247 0125 919,-
125	63	90	40	11	11	3.0	125A90190-16-04-040063	A1 B3 C1	260247 0126 1.169,-

### Spare parts

Screw		Cutter retaining screw with through-hole		TORX	
art.no.	€	art.no.	€	art.no.	€
A1 321099 0017	3,54	B1 321099 0043	44,50	C1 703053 0150	1,93
		B2 321099 0044	44,50		
		B3 321099 0045	44,50		

## Milling inserts LN.. 1306.. TGPLUS 90190

NEW

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	LNXT 130604 PNER-MP	•	•	•				PH 5320	10 285295 0126	17,95
			LNXT 130608 PNER-MP	•	•	•				PH 7740	10 285295 0148	17,95
				•		•			•	PHP 920	10 285295 0191	19,35
				•		•				PH 5320	10 285295 0226	17,95
				•	•					PH 7740	10 285295 0248	17,95
				•						PHS 740	10 285295 0274	20,70
				•		•			•	PHP 920	10 285295 0291	19,35

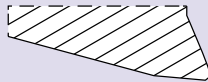

ISO	PH 5320	PH 7740	PHP 920	PHS 740
ISO P steel		Vc = 110 - 170	Vc = 140 - 250	Vc = 110 - 170
ISO M stainless steel		Vc = 70 - 180		
ISO K cast iron	Vc = 100 - 270		Vc = 90 - 300	
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.25	fz = 0.1 - 0.2	fz = 0.1 - 0.35 ap = 11	

## ATORN® High-speed milling cutters range

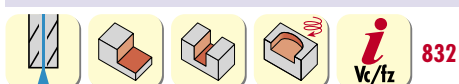
**INFO**
**Exactly 90°**

- Shoulder milling at exactly 90° in steel, cast iron, stainless steel and non-ferrous materials
- Extremely smooth running with low power consumption
- Large selection of base bodies and indexable cutting inserts
- Indexable cutting inserts in four sizes with different corner radii
- Extra-long end milling cutters for deep cavities
- Cutting depths of up to 16.5 mm
- High feed rate due to the large number of thread ridges
- Soft cut due to extremely positive geometry and irregular pitch
- All milling cutters have an internal coolant supply and have been surface-treated

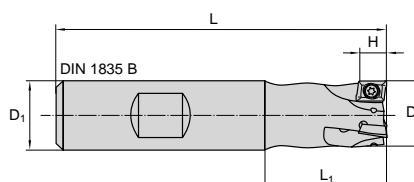




Indexable insert designation	Features	Chip shape levels
<b>ADKX</b>	Universal indexable cutting insert geometry with circumferential protective chamfer for machining steel and cast iron materials as well as stainless steels	 -SR -SR-TR
<b>ADHX</b>	Special ground indexable cutting insert geometry with polished face and sharp cutting edges for machining non-ferrous materials (aluminium, soft copper alloys and plastics)	 -FR-ALC

## ATORN® 90° end milling cutter





- **For milling inserts, type AD..X 06..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum



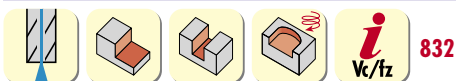
D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N·m			art.no.	€
10	10	5.5	20	60	1	0.7	A1	B1	<b>264002 0010</b>	<b>224,-</b>
12	12	5.5	25	70	2	0.7	A1	B1	264002 0012	<b>237,-</b>
14	14	5.5	25	70	3	0.7	A1	B1	264002 0014	<b>223,-</b>
16	16	5.5	28	76	3	0.7	A1	B1	264002 0016	<b>249,-</b>
16	16	5.5	28	76	4	0.7	A1	B1	264002 0116	<b>265,-</b>
18	16	5.5	28	76	4	0.7	A1	B1	264002 0018	<b>275,-</b>
20	20	5.5	36	86	4	0.7	A1	B1	264002 0020	<b>294,-</b>
20	20	5.5	36	86	5	0.7	A1	B1	264002 0120	<b>320,-</b>
25	20	5.5	36	86	6	0.7	A1	B1	264002 0025	<b>336,-</b>
25	25	5.5	40	96	7	0.7	A1	B1	264002 0125	<b>365,-</b>
32	25	5.5	86	96	8	0.7	A1	B1	264002 0032	<b>395,-</b>

2127

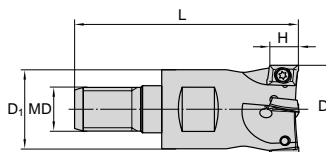
**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
	A1 264000 9901	<b>5,05</b>		B1 703053 0060	<b>1,93</b>
	3106			7114	

## ATORN® 90° screw-in milling cutter



- For milling inserts, type AD..X 06..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- Internal coolant supply
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy



D mm	D1 mm	L mm	MD	Z	H mm	Tightening torque max. N-m			art.no.	€
12	13	45	M8	2	5.5	0.7	A1	B1	264001 0012	213,-
16	13	45	M8	3	5.5	0.7	A1	B1	264001 0016	249,-
16	13	45	M8	4	5.5	0.7	A1	B1	264001 0017	245,-
20	18	49	M10	4	5.5	0.7	A1	B1	264001 0020	259,-
20	18	49	M10	5	5.5	0.7	A1	B1	264001 0021	286,-
25	21	55	M10	7	5.5	0.7	A1	B1	264001 0025	311,-

2127

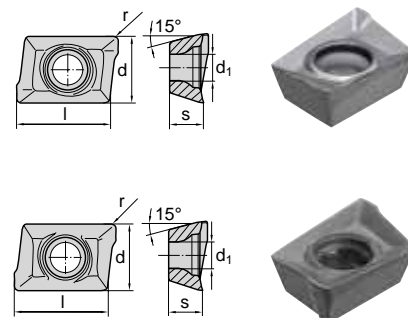
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9901	5,05	B1	703053 0060	1,93
	3106			7114	

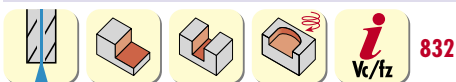
## ATORN® AD..X 06.. milling inserts

### Milling inserts

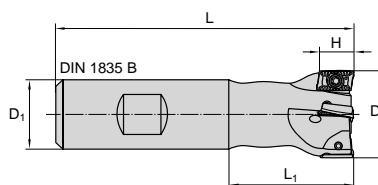
ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO <b>P</b> <b>K</b> <b>N</b>		ISO <b>N</b>		
							art.no.	€	art.no.	€	
ADHX 060202 FR-ALC	6.35	4.76	2.38	2	0.2	10	282001 1006	12,75	10	282001 1007	12,15
							2131			2131	
ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO <b>P</b> <b>M</b> <b>S</b>		ISO <b>P</b> <b>K</b> <b>N</b>		
							art.no.	€	art.no.	€	
ADKX 060202 SR	6.35	4.76	2.38	2	0.2	10	282002 1001	10,60	10	282002 1006	10,60
ADKX 060202 SR	6.35	4.76	2.38	2	0.4	10	282002 2001	10,60	10	282002 2006	10,60
							2131			2131	



## ATORN® 90° end milling cutter



- For milling inserts, type AD..X 09..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- Internal coolant supply
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy



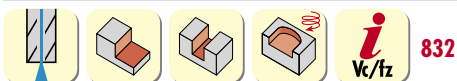
D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
16	16	8.5	28	76	2	1.2	A1	B1	264004 0016	203,-
20	20	8.5	36	86	3	1.2	A1	B1	264004 0020	237,-
20	20	8.5	36	86	4	1.2	A1	B1	264004 0021	249,-
25	20	8.5	36	86	4	1.2	A1	B1	264004 0025	270,-
25	20	8.5	36	86	5	1.2	A1	B1	264004 0026	294,-
32	25	8.5	40	86	6	1.2	A1	B1	264004 0032	336,-

2127

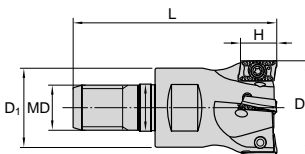
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9902	5,90	B1	703053 0080	1,93
	3106			7114	

## ATORN® 90° screw-in milling cutter



- For milling inserts, type AD..X 09..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy

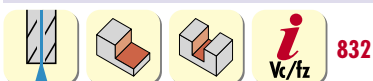


D mm	D1 mm	L mm	MD	Z	H mm	Tightening torque max. N-m			art.no.	€
20	18	49	M10	3	8.5	1.2	A1	B1	264003 0020	213,-
25	21	55	M12	4	8.5	1.2	A1	B1	264003 0025	270,-
32	29	67	M16	6	8.5	1.2	A1	B1	264003 0032	305,-
2127										

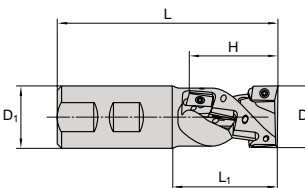
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 264000 9902	5,90	3106	B1 703053 0080	1,93	7114

## ATORN® 90° porcupine milling cutter



- For milling inserts, type AD..X 09..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy



D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
20	20	25	36	86	6	1.2	A1	B1	264005 0020	435,-
25	25	33	44	100	8	1.2	A1	B1	264005 0025	495,-
32	32	41	55	115	15	1.2	A1	B1	264005 0032	599,-
2127										

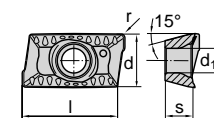
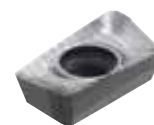
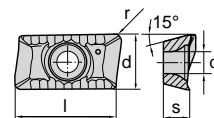
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 264000 9902	5,90	3106	B1 703053 0080	1,93	7114

## ATORN® AD..X 09.. milling inserts

### ADHX FR

ISO designation	l mm	d mm	s mm	d1 mm	R mm	⊞	ISO <b>K N</b>		ISO <b>N</b>		
							HC4410		HW4410		
							art.no.	€	art.no.	€	
ADHX 090308 FR-ALC	9.52	5.56	3.18	2.8	0.8	10	282003 1006	13,75	10	282003 1007	13,15
ADHX 090312 FR-ALC	9.52	5.56	3.18	2.8	1.2	10	282003 2006	13,75	10	282003 2007	13,15
2131							2131				

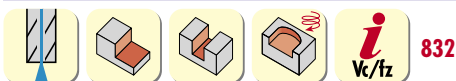


### ADKX SR-TR

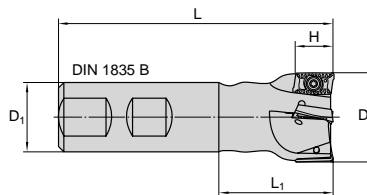
ISO designation	l mm	d mm	s mm	d1 mm	R mm	⊞	ISO <b>P M S</b>		ISO <b>M</b>		ISO <b>M</b>		ISO <b>P K N</b>				
							HC4640		HC4540 dry milling		HC4544 wet milling		HC4410				
							art.no.	€	art.no.	€	art.no.	€	art.no.	€			
ADKX 090304 SR-TR	9.52	5.56	3.18	2.8	0.4	10	282004 1001	11,50					10	282004 1006	11,50		
ADKX 090308 SR-TR	9.52	5.56	3.18	2.8	0.8	10	282004 2001	11,50	10	282004 2003	11,50	10	282004 2004	11,50	10	282004 2006	11,50
ADKX 090312 SR-TR	9.52	5.56	3.18	2.8	1.2	10	282004 3001	11,50	10	282004 3003	11,50	10	282004 3004	11,50	10	282004 3006	11,50
ADKX 090316 SR-TR	9.52	5.56	3.18	2.8	1.6	10	282004 4001	11,50	10	282004 4003	11,50	10	282004 4004	11,50	10	282004 4006	11,50
2131							2131		2131		2131						



### ATORN® 90° end milling cutter



- For milling inserts, type AD..X 12..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy

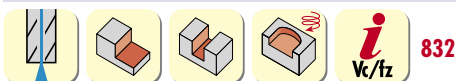


D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
20	20	12	36	86	2	2.25	A1	B1	264007 0020	213,-
25	20	12	36	86	3	2.25	A1	B1	264007 0025	237,-
32	25	12	40	96	4	2.25	A1	B1	264007 0032	315,-
32	25	12	40	96	5	2.25	A1	B1	264007 0033	375,-
40	32	12	50	110	6	2.25	A1	B1	264007 0040	405,-
2127										

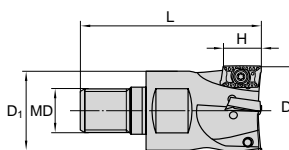
#### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9903	6,90	B1	703053 0080	1,93
3106			7114		

### ATORN® 90° screw-in milling cutter



- For milling inserts, type AD..X 12..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy

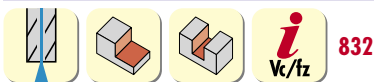


D mm	D1 mm	L mm	MD	Z	H mm	Tightening torque max. N-m			art.no.	€
32	29	67	M16	4	12	2.25	A1	B1	264006 0032	305,-
40	29	67	M16	6	12	2.25	A1	B1	264006 0040	346,-
2127										

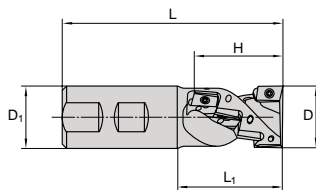
#### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9903	6,90	B1	703053 0080	1,93
3106			7114		

### ATORN® 90° roughing spiral flute end milling cutter



- For milling inserts, type AD..X 12..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy



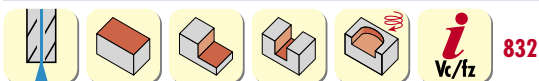
D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
32	32	45	55	115	8	2.25	A1	B1	264008 0032	529,-
40	40	55	70	140	15	2.25	A1	B1	264008 0040	919,-
2127										

#### Spare parts

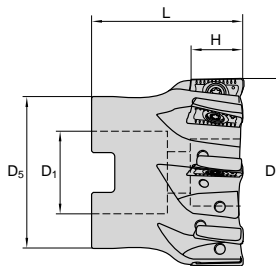
Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9903	6,90	B1	703053 0080	1,93
3106			7114		



## ATORN® 90° shoulder milling cutter



- For milling inserts, type AD..X 12..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- Internal coolant supply
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy

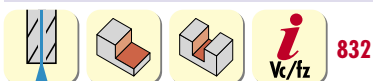


D mm	L mm	D5 mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
40	40	32	16	4	12	2.25	A1	B1	264009 0040	259,-
40	40	32	16	6	12	2.25	A1	B1	264009 0041	270,-
50	40	40	22	5	12	2.25	A1	B1	264009 0050	326,-
50	40	40	22	7	12	2.25	A1	B1	264009 0051	385,-
63	40	50	22	6	12	2.25	A1	B1	264009 0063	415,-
63	40	50	22	9	12	2.25	A1	B1	264009 0064	475,-

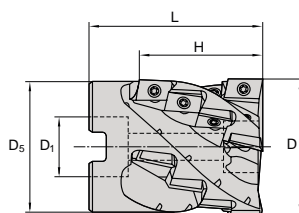
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9903	6,90	B1	703053 0080	1,93
	3106			7114	

## ATORN® 90° roughing spiral flute milling cutter



- For milling inserts, type AD..X 12..
- Just one insert type for both face and side cutting edges
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- Internal coolant supply
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy



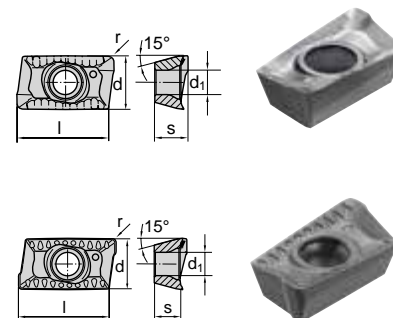
D mm	L mm	D5 mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
40	55	38	16	9	34	2.25	A1	B1	264010 0040	709,-
50	65	48	22	16	45	2.25	A1	B1	264010 0050	959,-
63	70	58	27	20	45	2.25	A1	B1	264010 0063	1.109,-

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9903	6,90	B1	703053 0080	1,93
	3106			7114	

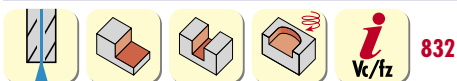
## ATORN® AD..X 12.. milling inserts

ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO		ISO		
							HC4410		HW4410		
							art.no.	€	art.no.	€	
ADHX 120408 FR-ALC	12.7	7.4	4.76	3.4	0.8	10	282005 1006	14,60	10	282005 1007	13,35
ADHX 120412 FR-ALC	12.7	7.4	4.76	3.4	1.2	10	282005 2006	14,60	10	282005 2007	13,35
ADHX 120416 FR-ALC	12.7	7.4	4.76	3.4	1.6	10	282005 3006	14,60	10	282005 3007	13,35

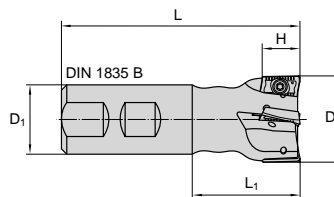


ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO		ISO		ISO		ISO				
							HC4640		HC4540 dry milling		HC4544 wet milling		HC4410				
							art.no.	€	art.no.	€	art.no.	€	art.no.	€			
ADKX 120408 SR-TR	12.7	7.4	4.76	3.4	0.8	10	282006 1001	11,90	10	282006 1003	11,90	10	282006 1004	11,90	10	282006 1006	11,90
ADKX 120412 SR-TR	12.7	7.4	4.76	3.4	1.2	10	282006 2001	11,90	10	282006 2003	11,90	10	282006 2004	11,90	10	282006 2006	11,90
ADKX 120416 SR-TR	12.7	7.4	4.76	3.4	1.6	10	282006 3001	11,90	10	282006 3003	11,90	10	282006 3004	11,90	10	282006 3006	11,90
ADKX 120420 SR-TR	12.7	7.4	4.76	3.4	2.0	10	282006 4001	11,90				10	282006 4006	11,90			

## ATORN® 90° end milling cutter



- For milling inserts, type AD..X 17..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy

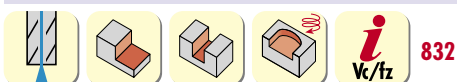


D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
25	25	16.5	40	96	2	3.5	A1	B1	264011 0025	192,50
32	32	16.5	40	110	3	3.5	A2	B1	264011 0032	237,-
40	32	16.5	50	110	4	3.5	A2	B1	264011 0040	305,-
2127										

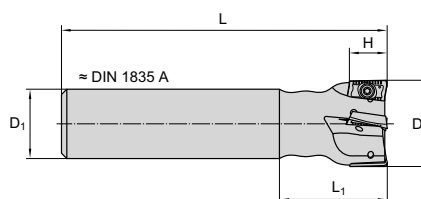
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9904	7,80	B1	703053 0150	1,93
A2	264000 9905	7,80			
		3106			7114

## ATORN® 90° end milling cutter, long



- For milling inserts, type AD..X 17..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank in accordance with DIN 1835 A
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy

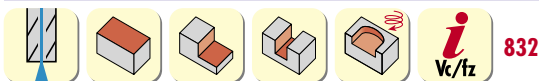


D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
25	25	16.5	40	200	2	3.5	A1	B1	264012 0025	224,-
32	32	16.5	50	250	3	3.5	A2	B1	264012 0032	294,-
40	32	16.5	50	250	4	3.5	A2	B1	264012 0040	390,-
2127										

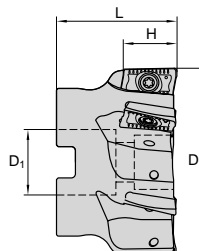
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9904	7,80	B1	703053 0150	1,93
A2	264000 9905	7,80			
		3106			7114

## ATORN® 90° shoulder milling cutter



- For milling inserts, type AD..X 17..
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy

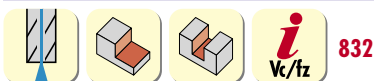


D mm	L mm	D1 mm	Z	H mm	Tightening torque max. N-m			art.no.	€
40	36	16	4	16.5	3.5	A1	B1	264014 0040	270,-
50	40	22	5	16.5	3.5	A1	B1	264014 0050	326,-
63	40	22	6	16.5	3.5	A1	B1	264014 0063	385,-
80	50	27	8	16.5	3.5	A1	B1	264014 0080	495,-
100	50	32	9	16.5	3.5	A1	B1	264014 0100	649,-
125	63	40	9	16.5	3.5	A1	B1	264014 0125	799,-
125	63	40	11	16.5	3.5	A1	B1	264014 0126	809,-
2127									

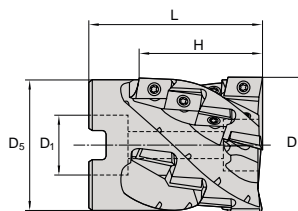
### Spare parts



Screw			TORX		
	art.no.	€		art.no.	€
A1	264000 9905	7,80	B1	703053 0150	1,93
		3106			7114

## ATORN® 90° roughing spiral flute milling cutter





- For milling inserts, type AD..X 17..
- Just one insert type for both face and side cutting edges
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy




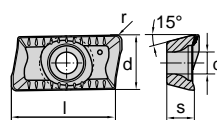
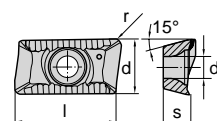
D mm	D5 mm	L mm	D1 mm	Z	H mm	Tightening torque max. N-m	 		art.no.	€
63	58	70	27	12	48	3.5	A1	B1	264013 0063	879,-
80	63	85	32	20	63	3.5	A1	B1	264013 0080	1.199,-
2127										

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
	A1 264000 9905	7,80		B1 703053 0150	1,93
	3106			7114	

## ATORN® AD..X 17.. milling inserts

ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO <b>K N</b>		ISO <b>N</b>		
							<b>HC4410</b>	€	<b>HW4410</b>	€	
ADHX 170508 FR-ALC	17.5	9.62	5.6	3.8	0.8	10	282007 1006	15,90	10	282007 1007	14,60
ADHX 170512 FR-ALC	17.5	9.62	5.6	3.8	1.2	10	282007 2006	15,90	10	282007 2007	14,60
ADHX 170516 FR-ALC	17.5	9.62	5.6	3.8	1.6	10	282007 3006	15,90	10	282007 3007	14,60
2131							2131				



ISO designation	l mm	d mm	s mm	d1 mm	R mm	ISO <b>P M S</b>		ISO <b>P K</b>		ISO <b>M</b>		ISO <b>M</b>		ISO <b>P K N</b>	
						<b>HC4640</b>	€	<b>HC4430</b>	€	<b>HC4540 dry milling</b>	€	<b>HC4544 wet milling</b>	€	<b>HC4410</b>	€
ADKX 170508 SR-TR	17.5	9.62	5.6	3.8	0.8	282008 1001	12,40	282008 1002	12,40					282008 1006	12,40
ADKX 170512 SR-TR	17.5	9.62	5.6	3.8	1.2	282008 2001	12,40	282008 2002	12,40	282008 2003	12,40	282008 2004	12,40	282008 2006	12,40
ADKX 170516 SR-TR	17.5	9.62	5.6	3.8	1.6	282008 3001	12,40	282008 3002	12,40	282008 3003	12,40	282008 3004	12,40	282008 3006	12,40
ADKX 170520 SR-TR	17.5	9.62	5.6	3.8	2.0	282008 4001	12,40	282008 4002	12,40	282008 4003	12,40	282008 4004	12,40	282008 4006	12,40
2131							2131		2131		2131		2131		

# THE COMPLETE MACHINING RANGE



**PALBIT**  
Machining tools  
411 pages  
Art.no. 019900 0315

Overview of all free manufacturers' catalogues on page 16/17

High feed-rate milling cutters are not only able to achieve longer service lives and greater removal rates, but also minimise production costs and processing times. It differs from high-speed machining, which is used primarily for finish machining with outstanding surface qualities, in the sense that high feed-rate milling predominantly offers short machining times for roughing. Special high feed-rate geometries were developed for this, which generally possess large radii. Thus the axial feed  $a_p$  is limited somewhat.

Depending on the reduced setting angle  $K$  (Kappa), the radial cutting force " $F_r$ " on the milling cutter and on the machine spindle is significantly reduced, allowing very high tooth feeds to be achieved without issue (Image 1). Tooth feed rates of up to  $f_z = 5$  mm are already used for machining steel. However should the axial force  $F_a$  increase in high feed-rate milling, this is not disruptive as it is absorbed directly by the tool and the machine spindle and in no way causes significant deformation or damage.

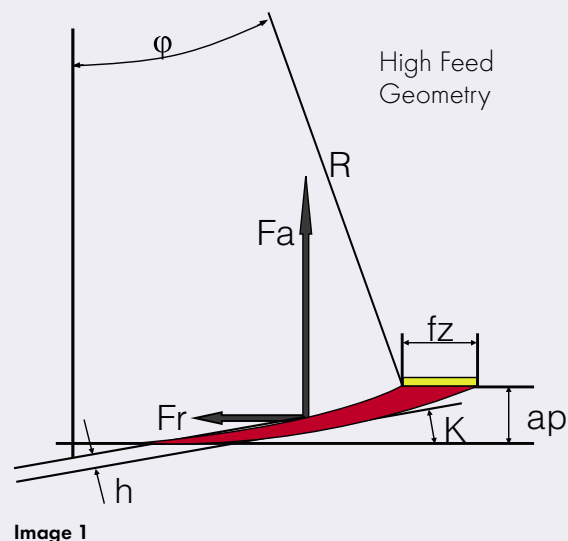


Image 1

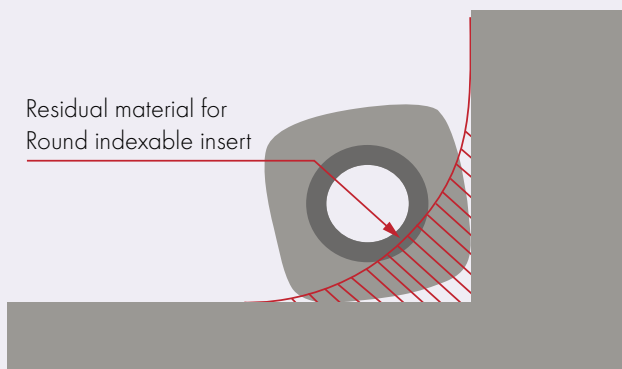


Image 2

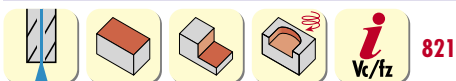
The special indexable insert geometry for high feed-rate milling helps to minimise the residual material during roughing tasks and thus improves the prerequisites for the subsequent finish machining. Image 2 illustrates the reduced residual material compared to machining with round indexable inserts.



Really quick ...

... with a high feed rate.

**ATORN®**  
Performance demands quality

**ATORN® High feed-rate screw-in milling cutter XDM.**

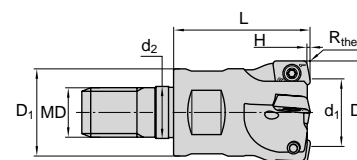
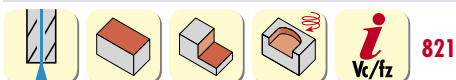
- For milling inserts XDM.. 09
- 2-edged, small, extremely robust indexable insert
- Positive geometry for easy cutting
- **High material removal rate, even with less powerful machining centres**
- Long service life thanks to nickel-plated design
- **High feed rates achievable**
- Uniform size of indexable cutting inserts

D	D1	d1	d2	L	MD	Z	Tightening torque max.	H	ER <sub>theor.</sub>			art.no.	€
mm	mm	mm	mm	mm			N-m	mm	mm				
16	13	7	8.5	28	M8	2	1.2	1	1.3	A1	B1	<b>286001</b> 2016	<b>227,-</b>
16	13	7	8.5	28	M8	3	1.2	1	1.3	A1	B1	286001 3016	247,-
20	18	11	10.5	30	M10	3	1.2	1	1.3	A2	B1	286001 3020	247,-
20	18	11	10.5	30	M10	4	1.2	1	1.3	A2	B1	286001 4020	259,-
25	21	16	12.5	33	M12	4	1.2	1	1.3	A2	B1	286001 4025	259,-
32	29	23	17	43	M16	5	1.2	1	1.3	A2	B1	286001 5032	321,-
35	29	26	17	43	M16	5	1.2	1	1.3	A2	B1	286001 5035	321,-
42	29	33	17	43	M16	6	1.2	1	1.3	A2	B1	286001 6042	390,-

2125

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	286900 9901	3,56	B1	703053 0080	1,93
A2	286900 9902	4,73			
3106			7114		

**ATORN® High feed-rate shell-type milling cutter XDM.**

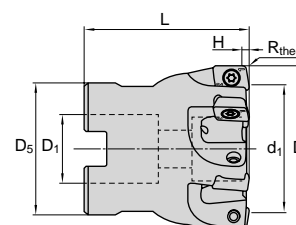
- For milling inserts XDM.. 09
- 2-edged, small, extremely robust indexable insert
- Positive geometry for easy cutting
- **High material removal rate, even with less powerful machining centres**
- Long service life thanks to nickel-plated design
- **High feed rates achievable**
- Uniform size of indexable cutting inserts

D	L	D5	D1	H	d1	Z	Tightening torque max.	ER <sub>theor.</sub>			art.no.	€
mm	mm	mm	mm	mm	mm		N-m	mm				
35	40	32	16	1	26	5	1.2	1.3	A1	B1	<b>286002</b> 5035	<b>348,-</b>
35	40	32	16	1	26	6	1.2	1.3	A1	B1	286002 6035	385,-
40	40	32	16	1	31	6	1.2	1.3	A1	B1	286002 6040	390,-
42	40	32	16	1	33	6	1.2	1.3	A1	B1	286002 6042	420,-
50	40	40	22	1	41	7	1.2	1.3	A1	B1	286002 7050	445,-
52	40	40	22	1	43	7	1.2	1.3	A1	B1	286002 7052	475,-
63	50	50	27	1	54	8	1.2	1.3	A1	B1	286002 8063	495,-
66	50	50	27	1	57	8	1.2	1.3	A1	B1	286002 8066	495,-
80	50	50	27	1	71	9	1.2	1.3	A1	B1	286002 9080	549,-

2125

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	286900 9902	4,73	B1	703053 0080	1,93
3106			7114		



# ATORN® High feed-rate milling cutter XDM.

INFO

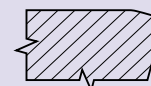
The ATORN high feed-rate milling cutter is used for roughing small and medium-sized components. The positive high feed-rate geometry of the standard, small indexable inserts allows for the maximum material removal rate, even on low-output machining centres.

Two different insert geometries in two different types of cutting material ensure that virtually all standard materials used in tool and mould making can be machined.

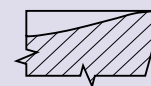
The Mini system is available as a screw-on milling cutter in diameters 16-42 mm with 2-6 cutting edges, and as a shell-type milling cutter in diameters 40-80 mm with up to 9 cutting edges. All cutting edges have an internal coolant supply. Only one indexable insert size is required for all tool diameters.

### Chip shape levels

SR



ER



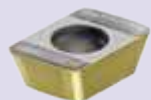
### XDMW

- Stable indexable cutting insert geometry for cutting high-strength tempered and tool steels
- Negative protective chamfer with cutting edge rounding



### XDMT

- Soft-cutting indexable cutting insert geometry for reduced cutting forces
- Use in unstable setups
- Particularly suitable for tool machines with low drive output



## ATORN® Milling inserts XDM.. 0903

### • HC4640

Ideal for high feed rates, tough carbide substrate with double PVD coating and outstanding suitability for roughing, with additional TiN layer around circumference for improved wear detection

### • HC4410

Wear-resistant superfine grain substrate for high machining capacity, universally suitable for high cutting speeds in steel at reduced feed rates

### • HC4544

Special superfine grain substrate for high machining capacity with stainless steel materials

ISO designation	l mm	d mm	s mm	d1 mm	R mm	☐	ISO <b>K11</b>		ISO <b>M</b>		
							art.no.	€	art.no.	€	
XDMW 0903 SR	9	6	3	2.8	1.3	10	286100 0110	12,35	10	286100 0140	12,35
							2126			2126	

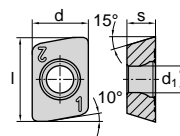
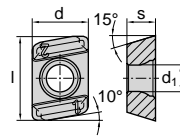
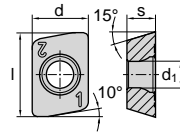
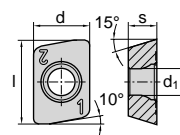
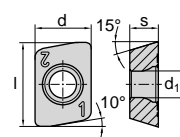
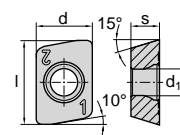
ISO designation	l mm	d mm	s mm	d1 mm	R mm	☐	ISO <b>K11</b>		ISO <b>M</b>		
							art.no.	€	art.no.	€	
XDMT 0903 ER	9	6	3	2.8	1.3	10	286101 0110	12,35	10	286101 0140	12,35
							2126			2126	

ISO designation	l mm	d mm	s mm	d1 mm	R mm	☐	ISO <b>M</b>	
							art.no.	€
XDMW 0903 SR	9	6	3	2.8	1.6	10	286102 0144	13,75
							2126	

ISO designation	l mm	d mm	s mm	d1 mm	R mm	☐	ISO <b>K11</b>	
							art.no.	€
XDMW 0903 SR	9	6	3	2.8	1.6	10	286103 0115	12,35
							2126	

ISO designation	l mm	d mm	s mm	d1 mm	R mm	☐	ISO <b>M</b>	
							art.no.	€
XDMW 0903 SR	9	6	3	2.8	1.6	10	286104 0140	12,55
							2126	

ISO designation	l mm	d mm	s mm	d1 mm	R mm	☐	ISO <b>M</b>	
							art.no.	€
XDMT 0903 ER	9	6	3	2.8	1.6	10	286105 0140	12,55
							2126	





## ATORN® High feed-rate milling cutter

INFO

- Roughing of smooth surfaces and cavities with high feed rates
- Machining of cavities by linear and circular interpolation
- Plunge milling even in unstable conditions
- Use of the same CAD/CAM programs as for milling with circular indexable inserts
- Can be used on traditional and modern high-performance machines
- High material removal rates and cost-effective machining of moulds, dies and other components
- Efficient machining even on low-performance machines
- Heat dissipation through the chips, so that heat-sensitive workpieces can be machined



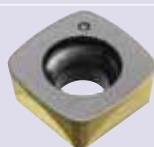
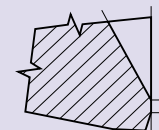
### Chip breaker



#### XCNT

- Universal geometry for a wide range of applications
- Wide negative protective chamfer for increased cutting edge stability
- Ideal for use on high-performance machines

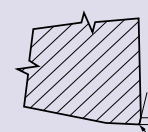
-SN-TR



#### XCNW

- Stable geometry for cutting high-strength tempered and tool steels
- Negative protective chamfer with cutting edge rounding

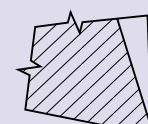
-SN



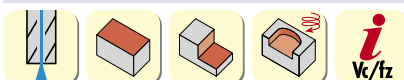
#### XCNT

- Soft-cutting geometry for reduced cutting forces
- Used with stainless steel and long-chipping materials
- Particularly suitable for machine tools with low drive output

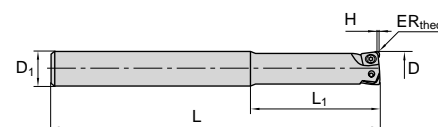
-EN-TR



## ATORN® High feed-rate milling cutter XCN.



- for milling inserts, type XCN.. 07
- 4-cutting-edge, extremely robust indexable inserts
- Deep cutting troughs with cutting surface topography
- Irregular pitch for low-vibration milling even for high exposed lengths
- Long service life thanks to nickel-plated design
- Wide range of applications

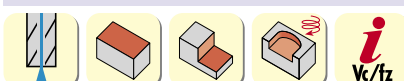


D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m	ERtheor. mm			art.no.	€
20	20	1	60	175	2	2.25	1.5	A1	B1	285001 0020	321,-
25	25	1	75	190	3	2.25	1.5	A1	B1	285001 0025	390,-
32	32	1	80	210	4	2.25	1.5	A1	B1	285001 0033	440,-

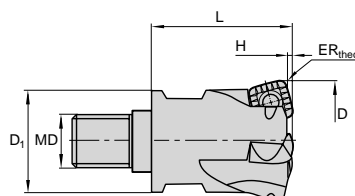
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 285000 9901	4,84	3106	B1 703053 0080	1,93	7114

## ATORN® High feed-rate screw-in milling cutter XCN.



- for milling inserts, type XCN.. 07
- 4-cutting-edge, extremely robust indexable inserts
- Deep cutting troughs with cutting surface topography
- Irregular pitch for low-vibration milling even for high exposed lengths
- Long service life thanks to nickel-plated design
- Wide range of applications



D mm	D1 mm	L mm	MD	H mm	Z	Tightening torque max. N-m	ERtheor. mm			art.no.	€
20	18	30	M10	1.0	2	2.25	1.5	A1	B1	285003 0020	311,-
25	21	33	M12	1.0	3	2.25	1.5	A1	B1	285003 0025	355,-
32	29	43	M16	1.0	4	2.25	1.5	A1	B1	285003 0033	425,-
35	29	43	M16	1.0	5	2.25	1.5	A1	B1	285003 0035	455,-

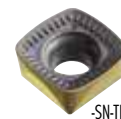
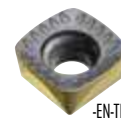
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 285000 9901	4,84	3106	B1 703053 0080	1,93	7114



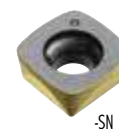
## ATORN® XCN..07 milling inserts

- **HC4640** ideal for high feed rates, tough carbide substrate with double PVD coating and outstanding suitability for roughing; with additional TiN layer around circumference for improved wear detection
- **HC4410** wear-resistant superfine grain substrate for high machining capacity, universally suitable for high cutting speeds in steel at reduced feed rates.

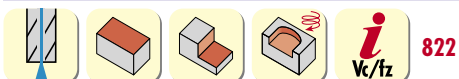


ISO designation	R mm	ISO <b>P K N S</b>		ISO <b>P M K</b>		ISO <b>P K M S</b>		ISO <b>P M K</b>					
			<b>HC4410</b> art.no.	€		<b>HC4640</b> art.no.	€		<b>HC4410</b> art.no.	€		<b>HC4640</b> art.no.	€
XCNT 070308 EN-TR	0.8							10	<b>285101 0110</b>	<b>16,90</b>	10	<b>285101 0140</b>	<b>18,15</b>
XCNT 070308 SN-TR	0.8	10	<b>285100 0110</b>	<b>18,15</b>	10	<b>285100 0140</b>	<b>19,15</b>						
			2126			2126			2126			2126	

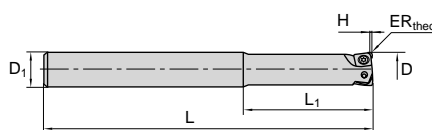
ISO designation	R mm	ISO <b>P K N S</b>		ISO <b>P M K</b>			
			<b>HC4410</b> art.no.	€		<b>HC4640</b> art.no.	€
XCNW 070308 SN	0.8	10	<b>285102 0110</b>	<b>17,20</b>	10	<b>285102 0140</b>	<b>19,55</b>
			2126			2126	



## ATORN® High feed-rate milling cutter XCN.



- **for milling inserts, type XCN.. 09**
- 4-cutting-edge, extremely robust indexable inserts
- Deep cutting troughs with cutting surface topography
- **Irregular pitch for low-vibration milling even for high exposed lengths**
- Long service life thanks to nickel-plated design
- **Wide range of applications**

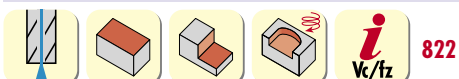


D mm	D1 mm	H mm	L1 mm	L mm	Z	Tightening torque max. N-m	ERtheor. mm			art.no.	€
32	32	1.2	80	210	3	3.5	2.5	A1	B1	<b>285002 0032</b>	<b>415,-</b>
32	32	1.2	80	210	4	3.5	2.5	A1	B1	<b>285002 0033</b>	<b>435,-</b>
										2125	

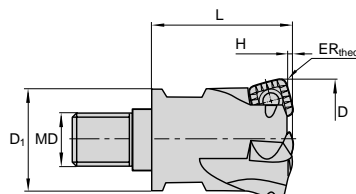
### Spare parts

Screw		Wrench	
art.no.	€	art.no.	€
A1 285000 9902	<b>4,84</b>	B1 705141 0015	<b>6,35</b>
	3106		7114

## ATORN® High feed-rate screw-in milling cutter XCN.



- **for milling inserts, type XCN.. 09**
- 4-cutting-edge, extremely robust indexable inserts
- Deep cutting troughs with cutting surface topography
- **Irregular pitch for low-vibration milling even for high exposed lengths**
- Long service life thanks to nickel-plated design
- **Wide range of applications**

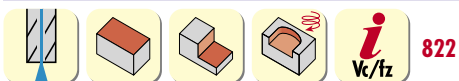


D mm	D1 mm	L mm	MD	Z	Tightening torque max. N-m	ERtheor. mm	H mm			art.no.	€
32	29	43	M16	3	3.5	2.5	1.2	A1	B1	<b>285004 0032</b>	<b>405,-</b>
32	29	43	M16	4	3.5	2.5	1.2	A1	B1	<b>285004 0033</b>	<b>365,-</b>
35	29	43	M16	4	3.5	2.5	1.2	A1	B1	<b>285004 0035</b>	<b>465,-</b>
42	29	43	M16	5	3.5	2.5	1.2	A1	B1	<b>285004 0043</b>	<b>509,-</b>
										2125	

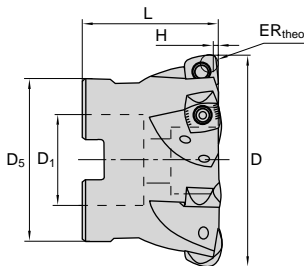
### Spare parts

Screw		Wrench	
art.no.	€	art.no.	€
A1 285000 9902	<b>4,84</b>	B1 705141 0015	<b>6,35</b>
	3106		7114

## ATORN® High feed-rate shell-type milling cutter XCN.



- for milling inserts, type XCN.. 09
- 4-cutting-edge, extremely robust indexable inserts
- Deep cutting troughs with cutting surface topography
- Irregular pitch for low-vibration milling even for high exposed lengths
- Long service life thanks to nickel-plated design
- Wide range of applications



D mm	L mm	D5 mm	D1 mm	H mm	Z	Tightening torque max. N-m	ERtheor. mm			art.no.	€
42	40	32	16	1.2	4	3.5	2.5	A1	B1	285005 0043	509,-
42	40	32	16	1.2	5	3.5	2.5	A1	B1	285005 0044	559,-
52	40	40	22	1.2	5	3.5	2.5	A1	B1	285005 0053	559,-
52	40	40	22	1.2	6	3.5	2.5	A1	B1	285005 0054	599,-

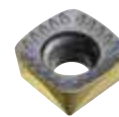
2125

### Spare parts

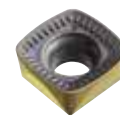
Screw			Wrench		
	art.no.	€		art.no.	€
	A1 285000 9903	4,33		B1 705141 0015	6,35
		3106			7114

## ATORN® XCN..09 milling inserts

- **HC4640** ideal for high feed rates, tough carbide substrate with double PVD coating and outstanding suitability for roughing; with additional TiN layer around circumference for improved wear detection
- **HC4410** wear-resistant superfine grain substrate for high machining capacity, universally suitable for high cutting speeds in steel at reduced feed rates.



-EN-TR



-SN-TR

ISO designation	R mm	ISO P K N S		ISO P M K		ISO P K M S		ISO P M K	
		HC4410 art.no.	€	HC4640 art.no.	€	HC4410 art.no.	€	HC4640 art.no.	€
XCNT 09T312 EN-TR	0.8					10	285101 0210	17,80	
XCNT 09T312 EN-TR	1.2					10	285101 0240	19,35	
XCNT 09T312 SN-TR	1.2	10	285100 0210	19,55	10	285100 0240	20,30		

2126

2126

2126

2126

ISO designation	R mm	ISO P K N S		ISO P M K			
		HC4410 art.no.	€	HC4640 art.no.	€		
XCNW 09T312 SN	1.2	10	285102 0210	20,30	10	285102 0240	20,90

2126

2126



-SN

# Transverse slot shell-type arbour



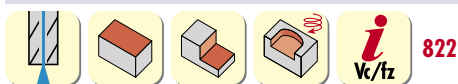
**SARA®**

pre-balanced to G2.5 at 25,000 rpm

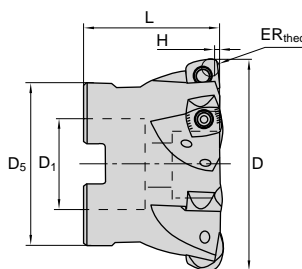
Page 1211



## ATORN® High feed-rate shell-type milling cutter XCN.



- for milling inserts, type XCN.. 12
- 4-cutting-edge, extremely robust indexable inserts
- Deep cutting troughs with cutting surface topography
- Irregular pitch for low-vibration milling even for high exposed lengths
- Long service life thanks to nickel-plated design
- Wide range of applications



D mm	L mm	D5 mm	D1 mm	H mm	Z	Tightening torque max. N-m	ERtheor. mm			art.no.	€
42	40	32	16	1.5	3	7.6	3.5	A1	B1	285006 0042	480,-
42	40	32	16	1.5	4	7.6	3.5	A1	B1	285006 0043	499,-
52	40	40	22	1.5	4	7.6	3.5	A1	B1	285006 0052	509,-
52	40	40	22	1.5	5	7.6	3.5	A1	B1	285006 0053	549,-
66	50	50	27	1.5	5	7.6	3.5	A1	B1	285006 0066	539,-
66	50	50	27	1.5	6	7.6	3.5	A1	B1	285006 0067	599,-
66	50	50	27	1.5	7	7.6	3.5	A1	B1	285006 0068	629,-
80	50	60	27	1.5	6	7.6	3.5	A1	B1	285006 0080	609,-
80	50	60	27	1.5	8	7.6	3.5	A1	B1	285006 0081	689,-
100	50	65	32	1.5	7	7.6	3.5	A1	B1	285006 0100	629,-
100	50	65	32	1.5	10	7.6	3.5	A1	B1	285006 0101	789,-

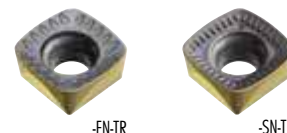
2125

### Spare parts

Screw			Wrench		
	art.no.	€		art.no.	€
A1	285000 9904	5,40	B1	705141 0020	7,05
	3106			7114	

## ATORN® XCN..12 milling inserts

- **HC4640** ideal for high feed rates, tough carbide substrate with double PVD coating and outstanding suitability for roughing; with additional TiN layer around circumference for improved wear detection
- **HC4410** wear-resistant superfine grain substrate for high machining capacity, universally suitable for high cutting speeds in steel at reduced feed rates.



ISO designation	R mm	ISO <b>P K N S</b>		ISO <b>P M K</b>		ISO <b>P K M S</b>		ISO <b>P M K</b>	
		art.no.	€	art.no.	€	art.no.	€	art.no.	€
XCNT 120520 EN-TR	1.2					10	285101 0310	18,75	
XCNT 120520 EN-TR	2.0					10	285101 0340	20,30	
XCNT 120520 SN-TR	2.0	10	285100 0310	20,30	10	285100 0340	21,40		

2126

2126

2126

2126

ISO designation	R mm	ISO <b>P K N S</b>		ISO <b>P M K</b>			
		art.no.	€	art.no.	€		
XCNW 120520 SN	2.0	10	285102 0310	19,65	10	285102 0340	21,40

2126

2126



# DRILLING THREADING MILLING

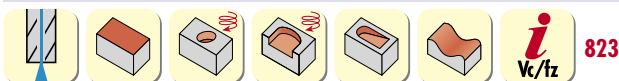


OSG  
Catalogue VI  
1024 pages  
Art.no. 019900 0208

Overview of all free manufacturers' catalogues on page 16/17



## palbit High feed-rate end milling cutter HIFEED 06410



- For milling inserts SO.. 0803
- 4-edged, extremely robust indexable insert
- Wide range of applications

D mm	D1 mm	L mm	L1 mm	Z	Tightening torque max. N-m	suitable indexable inserts	A1	B1	art.no.	€
20	20	130	75	2	1.4	SO..0803..	A1	B1	260218 0020	164,-
20	20	190	110	2	1.4	SO..0803..	A1	B1	260218 1020	194,50
25	25	140	80	3	1.4	SO..0803..	A1	B1	260218 0025	182,50
25	25	200	130	3	1.4	SO..0803..	A1	B1	260218 1025	213,-
32	32	150	90	4	1.4	SO..0803..	A1	B1	260218 0032	213,-
32	32	200	130	4	1.4	SO..0803..	A1	B1	260218 1032	243,-

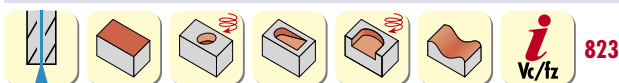
2174



### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 321099 0007	4,07		B1 703053 0090	1,93	
	3160			7114	

## palbit High feed-rate screw-in milling cutter HIFEED 06410



- For milling inserts SO.. 0803
- 4-edged, extremely robust indexable insert
- Wide range of applications

D mm	D1 mm	L mm	Z	MD	suitable indexable inserts	Tightening torque max. N-m	A1	B1	art.no.	€
20	16	25	2	10	SO..0803..	1.4	A1	B1	260219 0020	164,-
25	21	28	3	12	SO..0803..	1.4	A1	B1	260219 0025	182,50
32	29	35	4	16	SO..0803..	1.4	A1	B1	260219 0032	213,-
35	29	35	4	16	SO..0803..	1.4	A1	B1	260219 0035	213,-
42	29	35	5	16	SO..0803..	1.4	A1	B1	260219 0042	243,-

2174



### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 321099 0007	4,07		B1 703053 0090	1,93	
	3160			7114	

## Milling inserts SO..0803.... HIFEED 06410

### SOET 080315

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	SOET 080315-MS	●	●			●		PH 7740	10 285242 0148	13,50
					●			●		PHH 930	10 285242 0193	14,55

2170

ISO	PH 7740	PHH 930
ISO P steel	Vc = 80 - 180	
ISO M stainless steel	Vc = 70 - 180	Vc = 100 - 210
ISO S superalloys	Vc = 25 - 60	Vc = 30 - 110
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.40 - 1.8 ap = 0.05 - 1.0	fz = 0.10 - 1.3

### SOEW 080310

NEW

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	SOEW 080310 S	●		●				PHP 920	10 285241 0191	14,55
				●		●				PHP 910	10 285241 0192	14,55

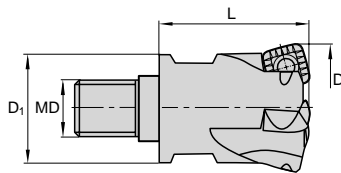
2170



ISO	PHP 910	PHP 920
ISO P steel	Vc = 140 - 250	Vc = 140 - 250
ISO K cast iron	Vc = 150 - 300	Vc = 120 - 270
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.30 - 1.80 ap = 0.05 - 1.0	

palbit  High feed-rate screw-in milling cutter HIFEED 06690





- For milling inserts SO.. 13M
- 4-edged, extremely robust indexable insert
- Wide range of applications



D mm	D1 mm	L mm	Z	MD	Tightening torque max. N-m	suitable indexable inserts			art.no.	€
32	29	35	3	16	3.0	SO..13M5..	A1	B1	260220 0032	213,-
35	29	35	3	16	3.0	SO..13M5..	A1	B1	260220 0035	213,-
42	29	35	4	16	3.0	SO..13M5..	A1	B1	260220 0042	243,-

2174

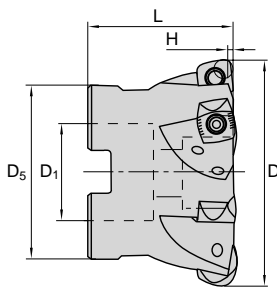
Spare parts



Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0017	3,54	B1	703053 0150	1,93
	3160			7114	

palbit  High feed-rate shoulder milling cutter HIFEED 06690





- For milling inserts SO.. 13M
- 4-edged, extremely robust indexable insert
- Wide range of applications



D mm	L mm	D5 mm	D1 mm	H mm	Z	Tightening torque max. N-m	suitable indexable inserts			art.no.	€
50	45	40	22	1.5	4	3.0	SO..13M5	A1	B1	260221 0050	291,-
52	45	40	22	1.5	4	3.0	SO..13M5	A1	B1	260221 0052	291,-
63	50	48	27	1.5	5	3.0	SO..13M5	A1	B1	260221 0063	309,-
66	50	48	27	1.5	5	3.0	SO..13M5	A1	B1	260221 0066	309,-
80	50	60	27	1.5	6	3.0	SO..13M5	A1	B1	260221 0080	385,-
100	50	70	32	1.5	8	3.0	SO..13M5	A1	B1	260221 0100	475,-



















2174

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0017	3,54	B1	703053 0150	1,93
	3160			7114	

Milling inserts SO..13M5.... HIFEED 06690



















SOET 13M520

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	SOET 13M520-MS							PH 7930	10 285245 0151	15,90
										PH 7740	10 285245 0148	15,90
										PHH 930	10 285245 0193	16,95

2170

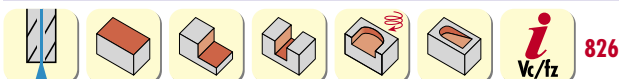
ISO	PH 7740	PH 7930	PHH 930
ISO P steel	Vc = 80 - 180	Vc = 100 - 220	
ISO M stainless steel	Vc = 70 - 180	Vc = 70 - 220	Vc = 90 - 190
ISO S superalloys	Vc = 25 - 60	Vc = 35 - 65	Vc = 40 - 80
Vc = [m/min]		fz = 0.4 - 2.0	
fz = [mm/Z]		ap = 0.05 - 1.5	
ap = [mm]			

SOEW 13M510

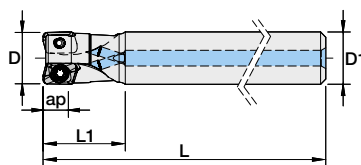
F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	SOEW 13M510 S							PH 7740	10 285244 0148	15,90
										PHP 910	10 285244 0192	16,95
										PHP 920	10 285244 0191	16,95



2170

ISO	PH 7740	PHP 910	PHP 920
ISO P steel	Vc = 80 - 180	Vc = 140 - 250	Vc = 140 - 250
ISO K cast iron		Vc = 150 - 300	Vc = 120 - 270
Vc = [m/min]		fz = 0.5 - 2.2	
fz = [mm/Z]		ap = 0.05 - 1.5	
ap = [mm]			

**palbit**  **End milling cutter 90° LINEPRO 20090**




- For milling inserts XP.. 0602
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**

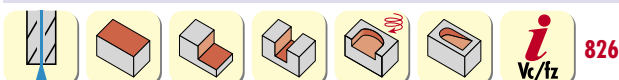


D mm	D1 mm	L1 mm	L mm	Z	suitable indexable inserts	Tightening torque max. N-m			art.no.	€
10	10	25	100	2	XP..0602..	0.3	A1	B1	<b>260239 0010</b>	<b>155,50</b>
10	10	16	55	2	XP..0602..	0.3	A1	B1	260239 1010	161,50
12	12	17	80	2	XP..0602..	0.3	A1	B1	260239 0012	161,50
12	12	30	120	3	XP..0602..	0.3	A1	B1	260239 0013	189,-
16	16	20	90	3	XP..0602..	0.3	A1	B1	260239 0016	194,50
16	16	20	90	4	XP..0602..	0.3	A1	B1	260239 1016	228,-
17	16	35	90	5	XP..0602..	0.3	A1	B1	260239 0017	261,-
21	20	35	90	5	XP..0602..	0.3	A1	B1	260239 0021	266,-

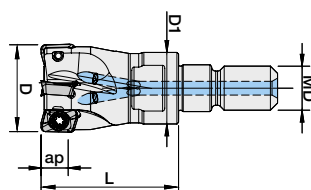
2174



**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0001	5,15	B1	703053 0060	1,93
	3160			7114	

**palbit**  **Screw-in milling cutter 90° LINEPRO 20090**




- For milling inserts XP.. 0602
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**



D mm	D1 mm	L mm	MD	Z	suitable indexable inserts	Tightening torque max. N-m			art.no.	€
10	9.8	20	M6	2	XP..0602..	0.3	A1	B1	<b>260240 0010</b>	<b>149,50</b>
11	9.8	20	M6	2	XP..0602..	0.3	A1	B1	260240 0011	155,50
12	9.8	20	M6	2	XP..0602..	0.3	A1	B1	260240 0012	161,50
12	9.8	20	M6	3	XP..0602..	0.3	A1	B1	260240 1012	161,50
16	13.0	25	M8	4	XP..0602..	0.3	A1	B1	260240 0016	166,50
17	13.0	25	M8	4	XP..0602..	0.3	A1	B1	260240 0017	166,50
20	18.0	30	M10	5	XP..0602..	0.3	A1	B1	260240 0020	206,-
25	21.0	30	M12	7	XP..0602..	0.3	A1	B1	260240 0025	266,-
32	29.0	35	M16	8	XP..0602..	0.3	A1	B1	260240 0032	327,-

2174

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0002	5,15	B1	703053 0060	1,93
	3160			7114	

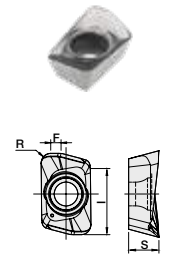


# Milling inserts XP.. 0602.. LINEPRO 20090

Improved successor qualities

## XPET-LP shoulder milling insert

NEW

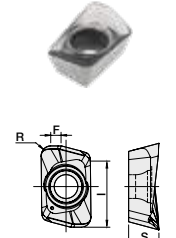
F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	-	-	ISO designation										
	XPET 060204 PDER-LP	●		●						PHP 930	10 285276 0190	14,55	
		●		●						PHP 920	10 285276 0191	14,55	
			●			●				PHH 930	10 285276 0193	14,55	
	XPET 060208 PDER-LP	●		●							PHP 930	10 285276 0290	14,55
		●		●							PHP 920	10 285276 0291	14,55
			●			●				PHH 930	10 285276 0293	14,55	
	XPET 060216 PDER-LP	●		●							PHP 930	10 285276 0490	14,55
		●		●							PHP 920	10 285276 0491	14,55

2170

ISO	PHH 930	PHP 920	PHP 930
ISO P steel		Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel	Vc = 100 - 210		
ISO K cast iron		Vc = 120 - 270	Vc = 100 - 250
ISO S superalloys	Vc = 30 - 110		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.07 ap = 1.0 - 4.0		

## XPET-MH finishing insert

NEW

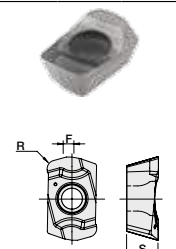
F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
	XPHW 060208 ZER-MH	●							●	PHH 603	10 285276 1576	15,90
		●							●	PHH 910	10 285276 1595	15,90

2170

ISO	PHH 603	PHH 910
ISO P steel	Vc = 180 - 310	Vc = 140 - 270
ISO H hard	Vc = 70 - 270	Vc = 70 - 260
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.03 - 0.10 ap = 1.0 - 4.0	

## XPET-HF high feed-rate insert

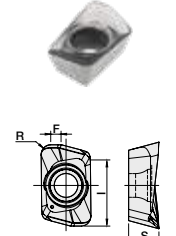
NEW

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
	XPET 060210 ZER-HF	●		●						PHP 930	10 285276 0390	14,55
		●		●						PHP 920	10 285276 0391	14,55
			●			●				PHH 930	10 285276 0393	14,55

2170

ISO	PHH 930	PHP 920	PHP 930
ISO P steel		Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel	Vc = 100 - 210		
ISO K cast iron		Vc = 120 - 270	Vc = 100 - 250
ISO S superalloys	Vc = 30 - 110		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.40 - 0.80 ap = max. 0.3		

## XPET-LN aluminium insert

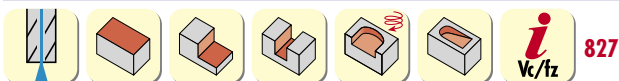
F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
	XPET 060202 PDFR-LN						●			PH 0910	10 285276 1320	14,80
	XPET 060204 PDFR-LN						●			PH 0910	10 285276 1420	14,80

2171

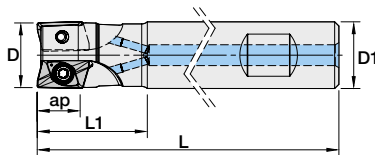
ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.07 ap = 1.0 - 4.0





**palbit**  **End milling cutter 90° LINEPRO 20190**





- For milling inserts XP..1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**

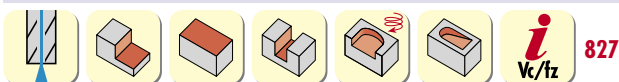


D mm	D1 mm	L1 mm	L mm	Z	suitable indexable inserts	Tightening torque max. N-m			art.no.	€
16	16	32	85	2	XP..1003..	1.2	A1	B1	<b>260241 0016</b>	<b>177,50</b>
16	16	70	150	2	XP..1003..	1.2	A1	B1	260241 1016	188,50
17	16	36	150	2	XP..1003..	1.2	A1	B1	260241 0017	211,-
20	20	28	90	3	XP..1003..	1.2	A1	B1	260241 0020	188,50
20	20	70	150	3	XP..1003..	1.2	A1	B1	260241 1020	199,50
22	20	70	150	3	XP..1003..	1.2	A1	B1	260241 0022	233,-
25	25	30	95	4	XP..1003..	1.2	A1	B1	260241 0025	272,-
25	25	80	150	4	XP..1003..	1.2	A1	B1	260241 1025	283,-
27	25	80	150	4	XP..1003..	1.2	A1	B1	260241 0027	288,-
2174										

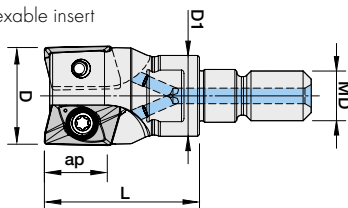
**Spare parts**



Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0006	4,07	B1	703053 0080	1,93
		3160			7114

**palbit**  **Screw-in milling cutter 90° LINEPRO 20190**






- For milling inserts XP..1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**

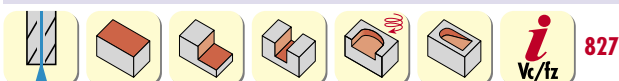


D mm	D1 mm	L mm	MD	Z	suitable indexable inserts	Tightening torque max. N-m			art.no.	€
16	14	25	M8	2	XP..1003..	1.2	A1	B1	<b>260242 0016</b>	<b>167,-</b>
20	18	30	M10	3	XP..1003..	1.2	A1	B1	260242 0020	206,-
25	21	35	M12	4	XP..1003..	1.2	A1	B1	260242 0025	222,-
32	29	35	M16	5	XP..1003..	1.2	A1	B1	260242 0032	250,-
2174										

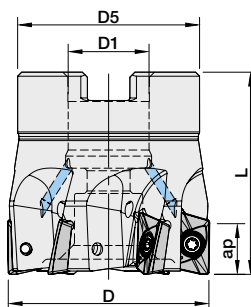
**Spare parts**



Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0006	4,07	B1	703053 0080	1,93
		3160			7114

**palbit**  **Shoulder milling cutter 90° LINEPRO 20190**





- For milling inserts XP..1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**



D mm	L mm	D5 mm	D1 mm	Z	suitable indexable inserts	Tightening torque max. N-m			art.no.	€
40	40	36	16	6	XP..1003..	1.2	A1	B1	<b>260243 0040</b>	<b>299,-</b>
50	40	42	22	7	XP..1003..	1.2	A1	B1	260243 0050	339,-
63	40	52	22	8	XP..1003..	1.2	A1	B1	260243 0063	375,-
2174										

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0006	4,07	B1	703053 0080	1,93
		3160			7114

# Milling inserts XP.. 1003.. LINEPRO 20190

Improved successor qualities

## XPET-LP shoulder milling insert

NEW

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			XPET 100304 PDER-LP	●		●				PHP 930	10 285276 0590	15,90
				●		●				PHP 920	10 285276 0591	15,90
					●			●		PHH 930	10 285276 0593	15,90
				●		●				PHP 930	10 285276 0890	15,90
				●		●				PHP 920	10 285276 0891	15,90
					●			●		PHH 930	10 285276 0893	15,90
				●		●				PHP 930	10 285276 1290	15,90
				●		●				PHP 920	10 285276 1291	15,90
					●			●		PHH 930	10 285276 1293	15,90

2170

ISO	PHH 930	PHP 920	PHP 930
ISO P steel		Vc = 140 - 250	Vc = 120 - 230
ISO K cast iron		Vc = 120 - 270	Vc = 100 - 250
ISO M stainless steel	Vc = 100 - 210		
ISO S superalloys	Vc = 30 - 110		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.08 - 0.25 ap = 0.4 - 10.0	fz = 0.08 - 0.20	fz = 0.05 - 0.07 ap = 2.0 - 9.0

## XPET-MP shoulder milling insert

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			XPET 100304 PDSR-MP			●				PH 5705	10 285276 0728	14,80
						●				PH 5740	10 285276 0730	14,80
				●		●				PH 7910	10 285276 0749	14,80
				●	●	●				PH 7930	10 285276 0751	14,80
				●		●				PHP 920	10 285276 0791	15,90
						●				PH 5705	10 285276 0928	14,80
						●				PH 5740	10 285276 0930	14,80
				●		●				PH 7910	10 285276 0949	14,80
				●		●				PHP 920	10 285276 0991	15,90
			●		●				PHP 930	10 285276 0990	15,90	

2170

ISO	PH 5705	PH 5740	PH 7910	PH 7930	PHP 920	PHP 930
ISO P steel			Vc = 160 - 250	Vc = 100 - 200	Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel				Vc = 70 - 220		
ISO K cast iron	Vc = 120 - 390	Vc = 90 - 240	Vc = 130 - 380	Vc = 100 - 260	Vc = 120 - 270	Vc = 100 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 ap = 2.0 - 9.0					

## XPET-MH finishing insert

NEW

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			XPHW 100308 ZER-MH	●					●	PHH 603	10 285276 1676	17,20
				●					●	PHH 910	10 285276 1695	17,20

2170

ISO	PHH 603	PHH 910
ISO P steel	Vc = 180 - 310	Vc = 140 - 270
ISO H hard	Vc = 70 - 270	Vc = 70 - 260
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.08 - 0.25 ap = 2.0 - 9.0	
	ap = 0.80 - 3.0	

## XPET-HF high feed-rate insert

NEW

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			XPET 100312 ZDR-HF	●		●				PHP 930	10 285276 1190	15,40
					●			●		PHH 930	10 285276 1193	16,40
				●		●				PHP 910	10 285276 1192	15,90
				●		●				PHP 920	10 285276 1191	16,40

2170

ISO	PHH 930	PHP 910	PHP 920	PHP 930
ISO P steel		Vc = 140 - 250	Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel	Vc = 100 - 210			
ISO K cast iron		Vc = 150 - 300	Vc = 120 - 270	Vc = 100 - 250
ISO S superalloys	Vc = 30 - 110			
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.40 - 0.80 ap = max. 0.8			

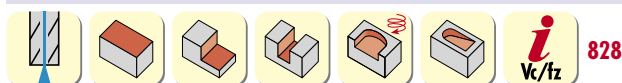
**XPET-LN aluminium shoulder milling insert**

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	XPET 100304 PDFR-LN				●			PH 0910	10 285276 0620	16,40
			XPET 100308 PDFR-LN				●			PH 0910	10 285276 0920	16,40
			XPET 100312 PDFR-LN				●			PH 0910	10 285276 1020	16,40

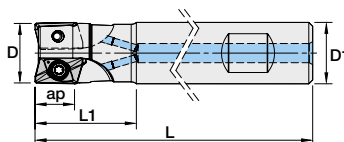
ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.25 ap = 2.0 - 9.0

2171

**palbit End milling cutter 90° LINEPRO 20290**



- For milling inserts XP..1706
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Internal coolant supply



D mm	D1 mm	L1 mm	L mm	Z	suitable indexable inserts	Tightening torque max. N-m	A1	B1	art.no.	€
32	32	50	110	2	XPET 1706..	5.0	A1	B1	260244 0032	211,-
32	32	60	200	2	XPET 1706..	5.0	A1	B1	260244 1032	245,-
40	40	50	115	3	XPET 1706..	5.0	A1	B1	260244 0040	272,-
40	40	60	200	3	XPET 1706..	5.0	A1	B1	260244 1040	317,-

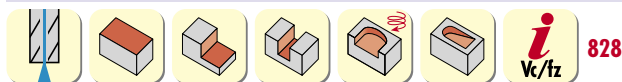
2174



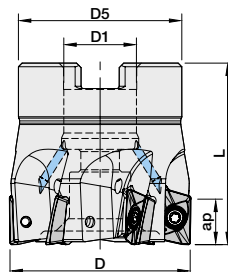
**Spare parts**

Screw			TORX		
art.no.	€		art.no.	€	
A1 321099 0018	4,34		B1 703053 0200	1,93	
	3160			7114	

**palbit Shoulder milling cutter 90° LINEPRO 20290**



- For milling inserts XP..1706
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Internal coolant supply



D mm	L mm	D5 mm	D1 mm	Z	suitable indexable inserts	Tightening torque max. N-m	A1	B1	art.no.	€
40	40	32	16	4	XPET 1706..	5.0	A1	B1	260245 0040	245,-
50	40	42	22	5	XPET 1706..	5.0	A1	B1	260245 0050	288,-
63	40	52	27	6	XPET 1706..	5.0	A1	B1	260245 0063	317,-
80	50	60	27	7	XPET 1706..	5.0	A1	B1	260245 0080	395,-
100	50	80	32	8	XPET 1706..	5.0	A1	B1	260245 0100	509,-
125	63	90	40	9	XPET 1706..	5.0	A1	B1	260245 0125	589,-

2174



**Spare parts**





















Screw			TORX		
art.no.	€		art.no.	€	
A1 321099 0018	4,34		B1 703053 0200	1,93	
	3160			7114	

## Milling inserts XPET 1706.. LINEPRO 20290

Improved successor qualities

NEW





























### XPET-LP shoulder milling insert

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			XPET 170608 PDER-LP							PH 7740	10 285288 0148	16,40
				XPET 170616 PDER-LP							PHP 920	10 285288 0191
			XPET 170608 PDER-LP								PH 7740	10 285289 0148
				XPET 170616 PDER-LP							PH 7920	10 285289 0150

2170

ISO	PH 7740	PH 7920	PHP 920
ISO P steel	Vc = 100 - 220	Vc = 140 - 280	Vc = 140 - 250
ISO M stainless steel	Vc = 70 - 220		
ISO K cast iron	Vc = 100 - 260	Vc = 120 - 350	Vc = 120 - 270
ISO S superalloys	Vc = 30 - 65		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.35 ap = 0.05 - 17.0		







### XPET-MP shoulder milling insert

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€		
-	-	-	ISO designation											
			XPET 170608 PDSR-MP							PH 5705	10 285290 0128	16,40		
				XPET 170616 PDSR-MP							PH 5740	10 285290 0130	16,40	
					XPET 170608 PDSR-MP							PH 7740	10 285290 0148	16,40
						XPET 170616 PDSR-MP							PHP 920	10 285290 0191
			XPET 170608 PDSR-MP									PH 5705	10 285291 0128	16,40
				XPET 170616 PDSR-MP							PH 5740	10 285291 0130	16,40	
			XPET 170608 PDSR-MP								PH 7740	10 285291 0148	16,40	
				XPET 170616 PDSR-MP							PH 7920	10 285291 0150	16,40	
			XPET 170608 PDSR-MP								PHP 920	10 285291 0191	17,70	

2170

ISO	PH 5705	PH 5740	PH 7740	PH 7920	PHP 920
ISO P steel			Vc = 100 - 220	Vc = 140 - 280	Vc = 140 - 250
ISO M stainless steel			Vc = 70 - 220		
ISO K cast iron	Vc = 120 - 380	Vc = 120 - 300	Vc = 100 - 260	Vc = 120 - 350	Vc = 120 - 270
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.35 ap = 0.05 - 17.0				

### XPET-LN aluminium shoulder milling insert

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	-	-	ISO designation										
			XPET 170608 PDFR-LN							PH 0910	10 285292 0120	18,95	
				XPET 170620 PDFR-LN							PH 0910	10 285293 0120	18,95
					XPET 170632 PDFR-LN							PH 0910	10 285294 0120

2171

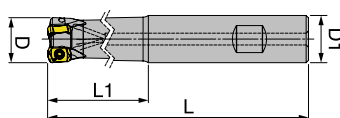
ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.35 ap = 0.05 - 17.0

## palbit End milling cutter 20° TETRAFEED

NEW



- for milling inserts XNKU 06
- easy cutting action due to the positive installation position of the indexable insert
- four cutting edges per insert
- tools deliver smooth milling performance
- internal coolant supply



D mm	D1 mm	L mm	L1 mm	Z	Tightening torque max. N·m	art.no.	€
20	20	160	90	3	1.20	260311 0020	228,-
25	25	180	100	4	1.20	260311 0025	250,-
32	32	200	120	5	1.20	260311 0032	291,-

2174

### Spare parts

Screw		TORX	
art.no.	€	art.no.	€
A1 321099 0006	4,07	B1 703053 0080	1,93

3160

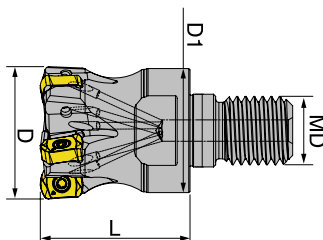
7114

palbit **Screw-in milling cutter 20° TETRAFEED**

**NEW**



- for milling inserts XN KU 06
- easy cutting action due to the positive installation position of the indexable insert
- **four cutting edges per insert**
- tools deliver smooth milling performance
- **internal coolant supply**



D mm	MD	D1 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
16	M8	13	25	2	1.20	A1	B1	<b>260312 0016</b>	<b>164,50</b>
20	M10	18	28	3	1.20	A1	B1	260312 0020	223,-
25	M12	18	30	4	1.20	A1	B1	260312 0025	244,-
32	M16	29	35	5	1.20	A1	B1	260312 0032	286,-
35	M16	29	35	6	1.20	A1	B1	260312 0035	297,-
40	M16	29	45	5	1.20	A1	B1	260312 0040	334,-
42	M16	29	35	7	1.20	A1	B1	260312 0042	339,-

2174

**Spare parts**

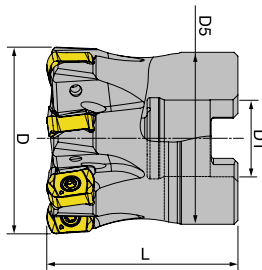
Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0006	4,07	B1	703053 0080	1,93
	3160			7114	

palbit **Shoulder milling cutter 20° TETRAFEED**

**NEW**



- for milling inserts XN KU 06
- easy cutting action due to the positive installation position of the indexable insert
- **four cutting edges per insert**
- tools deliver smooth milling performance
- **internal coolant supply**



D mm	D1 mm	D5 mm	L mm	Z	Tightening torque max. N-m			art.no.	€
40	16	36	40	7	1.20	A1	B1	<b>260313 0040</b>	<b>323,-</b>
50	22	42	40	8	1.20	A1	B1	260313 0050	380,-
52	22	40	40	8	1.20	A1	B1	260313 0052	390,-
63	22	40	40	9	1.20	A1	B1	260313 0063	430,-

2174

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0006	4,07	B1	703053 0080	1,93
	3160			7114	

**Milling inserts XN KU.. 06.. TETRAFEED**

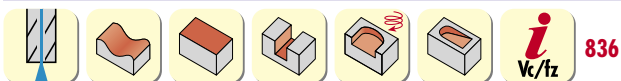
**NEW**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			XN KU 06T310-MP							PHH 930	10 285560 0167	12,75
										PHP 920	10 285560 0168	12,75
										PHS 740	10 285560 0174	12,75
										PHP 910	10 285560 0192	12,75

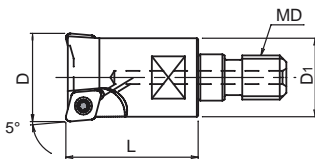
2170



ISO	PHH 930	PHP 910	PHP 920	PHS 740
ISO P steel		Vc = 140 - 250	Vc = 160 - 250	Vc = 140 - 230
ISO M stainless steel	Vc = 80 - 170			Vc = 70 - 180
ISO K cast iron			Vc = 100 - 320	Vc = 70 - 260
ISO S superalloys	Vc = 30 - 75			Vc = 30 - 70
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.5 - 1.4	fz = 0.5 - 1.5	ap = 1.0	fz = 0.5 - 1.3

**palbit**  **Screw-in milling cutter 95° LINEPRO 40095 / 41095**





- For milling inserts XD..0401.. / XD.. 0602..
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**



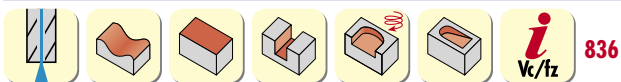
D mm	D1 mm	L mm	Z	MD	Tightening torque max. N-m	suitable indexable inserts			art.no.	€
10	9.8	20	2	6	0.3	XD..0401..	A1	B1	<b>260293 0010</b>	<b>152,50</b>
12	9.8	20	2	6	0.3	XD..0401..	A1	B1	260293 0012	<b>152,50</b>
16	13	23	2	8	1.2	XD..0602..	A2	B2	260293 0016	<b>152,50</b>
20	18	28	3	10	1.2	XD..0602..	A2	B2	260293 0020	<b>158,-</b>
25	21	30	3	12	1.2	XD..0602..	A2	B2	260293 0025	<b>170,50</b>
25	21	30	4	12	1.2	XD..0602..	A2	B2	260293 1025	<b>170,50</b>

2174

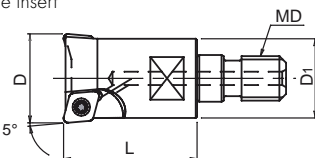
**Spare parts**



Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0003	<b>7,35</b>	B1	703053 0060	<b>1,93</b>
A2	321099 0005	<b>4,07</b>	B2	703053 0080	<b>1,93</b>
		3160			7114

**palbit**  **Screw-in milling cutter 95° LINEPRO 40595**





- For milling inserts XD..1003
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**



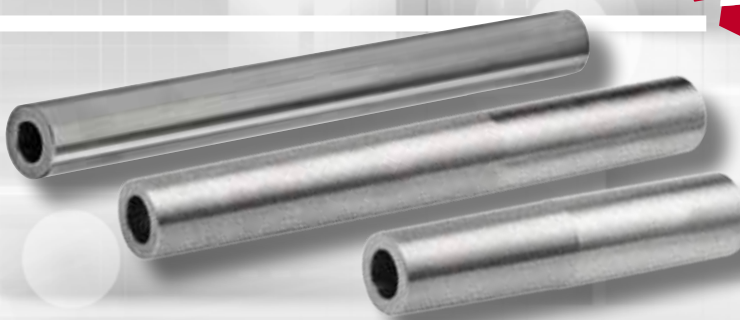
D mm	D1 mm	L mm	Z	MD	Tightening torque max. N-m	suitable indexable inserts			art.no.	€
25	21	35	2	12	3.0	XD..10T3..	A1	B1	<b>260294 0025</b>	<b>152,50</b>
35	29	43	3	16	3.0	XD..10T3..	A1	B1	260294 0035	<b>182,50</b>
42	29	43	4	16	3.0	XD..10T3..	A1	B1	260294 0042	<b>213,-</b>

2174

**Spare parts**


Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0009	<b>4,34</b>	B1	703053 0150	<b>1,93</b>
		3160			7114

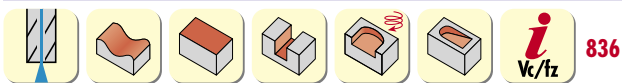
# Solid carbide extension



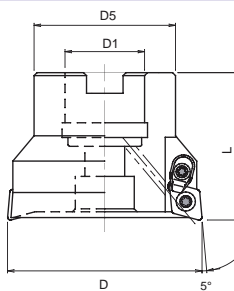
**Page 1162**






**palbit**  **Shoulder milling cutter 95° LINEPRO 40595**






- For milling inserts XP..10T3
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**



D mm	L mm	D5 mm	D1 mm	Z	Tightening torque max. N-m	suitable indexable inserts				art.no.	€
52	50	40	22	5	3.0	XD..10T3..	A1	B1	C1	<b>260295 0052</b>	<b>285,-</b>
66	50	48	27	6	3.0	XD..10T3..	A1	B1	C1	260295 0066	340,-
80	50	60	27	7	3.0	XD..10T3..	A1	B1	C1	260295 0080	425,-


2174

**Spare parts**

Clamping screw			Screw			TORX		
art.no.	€		art.no.	€		art.no.	€	
A1 321099 0008	4,07		B1 321099 0009	4,34		C1 703053 0150	1,93	
3160			3160			7114		

**Milling inserts XDHW LINEPRO 40095 / 40595 / 41095**

**XDHT shoulder milling inserts**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			XDHW 040105				●			PHD 103	10 285367 0162	40,-
			XDHW 040110	●		●			○	PH 6103	10 285367 0231	8,40
			XDHW 060210	●		●			○	PH 6125	10 285367 0232	8,40
		●						○	PH 6103	10 285367 0331	8,40	
		●							PH 6125	10 285367 0332	8,40	
		●							PH 6135	10 285367 0333	8,40	
			XDHW 10T310	●		●			○	PH 6910	10 285367 0341	8,40
		●							PH 6103	10 285367 0431	9,75	
		●				●			PH 6125	10 285367 0432	9,75	
		●				●			PH 6135	10 285367 0433	9,75	
				●		●				PH 6910	10 285367 0441	9,75

2170

ISO	PH 6103	PH 6125	PH 6135	PH 6910	PHD 103
ISO P steel	Vc = 180 - 300	Vc = 130 - 190	Vc = 120 - 180	Vc = 160 - 250	
ISO K cast iron		Vc = 80 - 290		Vc = 90 - 300	
ISO N Al/non-ferrous					Vc = 300 - 1000
ISO H hard	Vc = 120 - 260				
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.2 0.35		fz = 0.1 - 0.3	fz = 0.1 - 0.2 0.3	fz = 0.1 - 0.2 0.3
	ap = 0.05 - 0.8		ap = 0.05 - 1.0		ap = 0.05 - 0.8

**Over 200,000 tools available online!**

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages

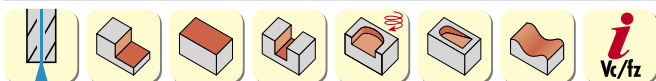


**Register online now!**

**www.saratools.com**





**palbit** End milling cutter 90° ALUPRO 76090



- For milling inserts XDGX 15M..
- Tools deliver smooth milling performance
- Internal coolant supply





**up to r = 3.2**

D mm	D1 mm	L mm	L1 mm	Z	suitable indexable inserts	Tightening torque max. N-m	 		art.no.	€
20	20	150	60	1	XDGX 15M5	3.0	A1	B1	260252 0020	277,-
25	25	180	90	2	XDGX 15M5	3.0	A1	B1	260252 0025	306,-
32	32	200	120	2	XDGX 15M5	3.0	A2	B1	260252 0032	333,-
40	32	250	65	3	XDGX 15M5	3.0	A2	B1	260252 0040	445,-



2174

**greater than r = 4.0**

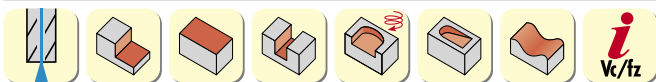
D mm	D1 mm	L mm	L1 mm	Z	Tightening torque max. N-m	suitable indexable inserts	 		art.no.	€
20	20	150	60	1	3.0	XDGX 15M5	A1	B1	260253 0020	278,-
25	25	180	90	2	3.0	XDGX 15M5	A1	B1	260253 0025	306,-
32	32	200	120	2	3.0	XDGX 15M5	A2	B1	260253 0032	333,-
40	32	250	65	3	3.0	XDGX 15M5	A2	B1	260253 0040	445,-

2174

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0012	4,07	B1	703053 0150	1,93
A2	321099 0014	4,07			
3160			7114		



**palbit** Shoulder milling cutter 90° ALUPRO 76090



- For milling inserts XDGX 15M..
- Tools deliver smooth milling performance
- Internal coolant supply





**up to r = 3.2**

D mm	L mm	D1 mm	D5 mm	Z	Tightening torque max. N-m	suitable indexable inserts	 		art.no.	€
40	50	16	32	3	3.0	XDGX 15M5	A1	B1	260250 0040	390,-
50	50	22	42	4	3.0	XDGX 15M5	A1	B1	260250 0050	445,-
63	50	22	48	5	3.0	XDGX 15M5	A1	B1	260250 0063	499,-
80	50	27	60	5	3.0	XDGX 15M5	A1	B1	260250 0080	529,-
100	63	32	73	6	3.0	XDGX 15M5	A1	B1	260250 0100	609,-



2174

**greater than r = 4.0**

D mm	L mm	D1 mm	D5 mm	Z	Tightening torque max. N-m	suitable indexable inserts	 		art.no.	€
40	50	16	32	3	3.0	XDGX 15M5	A1	B1	260251 0040	390,-
50	50	22	42	4	3.0	XDGX 15M5	A1	B1	260251 0050	445,-
63	50	22	48	5	3.0	XDGX 15M5	A1	B1	260251 0063	499,-
80	50	27	60	5	3.0	XDGX 15M5	A1	B1	260251 0080	529,-
100	63	32	73	6	3.0	XDGX 15M5	A1	B1	260251 0100	609,-

2174

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0014	4,07	B1	703053 0150	1,93
3160			7114		

## Milling inserts XDGX 15M5.. ALUPRO 76090

### XDGX 15M5..

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			XDGX 15M504 PDFR-LN				●			PH 0910	10 285301 0120	20,70
			XDGX 15M508 PDFR-LN				●			PH 0910	10 285301 0220	20,70
			XDGX 15M512 PDFR-LN				●			PH 0910	10 285301 0320	20,70
			XDGX 15M516 PDFR-LN				●			PH 0910	10 285301 0420	20,70
			XDGX 15M520 PDFR-LN				●			PH 0910	10 285301 0520	20,70
			XDGX 15M530 PDFR-LN				●			PH 0910	10 285301 0620	20,70
			XDGX 15M532 PDFR-LN				●			PH 0910	10 285301 0720	20,70
			XDGX 15M540 PDFR-LN				●			PH 0910	10 285301 0820	20,70
			XDGX 15M550 PDFR-LN				●			PH 0910	10 285301 0920	20,70

2171

ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min]	fz = 0.15 - 0.4
fz = [mm/Z]	ap = 0.05 - 14.0
ap = [mm]	

## ATORN® 90° indexable insert milling cutter for non-ferrous metals and plastics

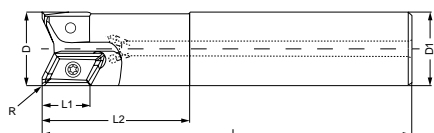
Z2 Z3 Z4 Z5 HPC 832

• For excavation and plunge milling without pilot holes

### Screw-in milling cutter

D mm	R mm	L1 mm	L2 mm	Z	d1 mm	Tightening torque max. N-m	Thread	suitable indexable inserts	art.no.	€
25	1.2	13.5	40	2	21	5.2	M 12	VPGT 160412-ALM	A1 B1	260400 2540 275,-
32	3.0	15	50	2	29	10	M 16	VCGT 220530-ALM	A2 B2	260400 3250 316,-
42	3.0	15	50	3	29	10	M 16	VCGT 220530-ALM	A2 B2	260400 4250 370,-

2125



### End milling cutters

D mm	R mm	L1 mm	L2 mm	D1 mm	L mm	Z	Tightening torque max. N-m	suitable indexable inserts	art.no.	€
25	1.2	13.5	40	20	200	2	5.2	VPGT 160412-ALM	A1 B1	260402 5200 274,-
32	3.0	15	50	25	220	2	10	VCGT 220530-ALM	A2 B2	260403 2220 315,-

2125



### Shell-type milling cutter

D mm	R mm	L1 mm	L mm	D1 mm	Z	Tightening torque max. N-m	suitable indexable inserts	art.no.	€
42	3.0	15	55	16	3	10	VCGT 220530-ALM	A2 B2	260400 4255 365,-
52	3.0	15	55	22	3	10	VCGT 220530-ALM	A2 B2	260400 5255 405,-
66	3.0	15	60	27	4	10	VCGT 220530-ALM	A2 B2	260400 6660 455,-
80	3.0	15	60	27	4	10	VCGT 220530-ALM	A2 B2	260400 8060 490,-
100	3.0	15	65	32	5	10	VCGT 220530-ALM	A2 B2	260401 0065 569,-

2125

### Spare parts

	Screw		TORX	
	art.no.	€	art.no.	€
A1	260400 0040	5,30	B1	703040 0080 4,63
A2	260400 0050	6,05	B2	703040 0150 4,84

### VCGT/VPGT ISO milling inserts

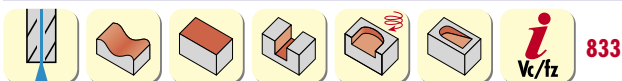
ISO designation	R mm	ISO N	Uncoated HW4410 art.no.	€	ISO N	Coated HC4410 art.no.	€
VPGT 1604012-ALM	1.2	10	270104 0161	16,90	10	270104 1661	17,70
VPGT 1604012-ALM	3.0	10	270104 1221	22,40	10	270104 0221	22,80

2126

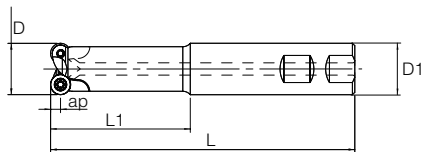
2126



**palbit** Copy milling cutter TOROMILL 24590 / 25090 / 25190



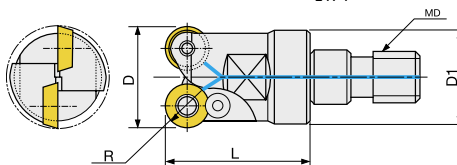
- For copy milling, radius cutting and contour milling in die and mould production
- Suitable for diagonal or axial plunge milling thanks to the clearance of the round indexable insert
- Internal coolant supply



**End milling cutter**

D mm	Z	suitable indexable inserts	L mm	L1 mm	ap max. mm	Tightening torque max. N-m	D1 mm			art.no.	€
15	2	RD..0702..	160	60	3.5	1.2	16	A1	C1	<b>260281 0001</b>	<b>161,50</b>
15	2	RD..0702..	220	120	3.5	1.2	25	A1	C1	260281 0002	198,-
20	2	RD..1003..	110	60	5.0	3.0	20	A2	C2	260281 0007	165,-
20	2	RD..1003..	160	60	5.0	3.0	20	A2	C2	260281 0003	171,50
20	2	RD..1003..	220	120	5.0	3.0	25	A2	C2	260281 0004	208,-
25	2	RD..12T3..	220	120	6.0	3.0	25	A2	C2	260281 0005	234,-
25	2	RD..12T3..	230	130	6.0	3.0	32	A2	C2	260281 0006	264,-

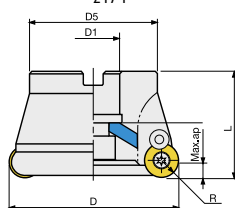
2174



**Screw-in milling cutter**

D mm	R mm	MD	Z	suitable indexable inserts	L mm	ap max. mm	Tightening torque max. N-m	D1 mm			art.no.	€
15	3.5	M8	3	RD..0702..	20	3.5	1.2	13	A1	C1	<b>260284 0001</b>	<b>152,50</b>
16	3.5	M8	2	RD..0702..	20	3.5	1.2	13	A1	C1	260284 0002	152,50
16	3.5	M8	3	RD..0702..	20	3.5	1.2	13	A1	C1	260284 0003	152,50
20	3.5	M10	4	RD..0702..	25	3.5	1.2	18	A1	C1	260284 0004	188,50
20	5.0	M10	2	RD..1003..	25	5	3.0	18	A2	C2	260284 0005	133,50
25	5.0	M12	3	RD..1003..	30	5	3.0	21	A2	C2	260284 0006	139,50
35	5.0	M16	5	RD..1003..	43	5	3.0	29	A2	C2	260284 0008	224,-
42	5.0	M16	5	RD..1003..	40	5	3.0	29	A2	C2	260284 0009	229,-
24	6.0	M16	2	RD..12T3..	32	6	3.0	21	A2	C2	260284 0010	139,50
35	6.0	M16	3	RD..12T3..	42	6	3.0	29	A2	C2	260284 0011	158,-
42	6.0	M16	4	RD..12T3..	42	6	3.0	29	A2	C2	260284 0012	219,-

2174



**Shell-type milling cutter**

D mm	R mm	D5 mm	γ	Z	suitable indexable inserts	L mm	ap max. mm	Tightening torque max. N-m	D1 mm			art.no.	€	
42	5	36	0	6	RD..1003..	44	5	3.0	16	A2	C2	<b>260287 0001</b>	<b>279,-</b>	
52	5	40	0	7	RD..1003..	50	5	3.0	22	A2	C2	260287 0002	321,-	
50	6	48	7	5	RD..12T3..	50	6	3.0	22	A2	B1	C2	260288 0001	249,-
52	6	40	0	5	RD..12T3..	50	6	3.0	22	A2	B1	C2	260287 0003	249,-
52	6	48	7	5	RD..12T3..	50	6	3.0	22	A2	B1	C2	260288 0002	249,-
66	6	40	0	6	RD..12T3..	50	6	3.0	27	A2	B1	C2	260287 0004	291,-
66	6	60	7	6	RD..12T3..	50	6	3.0	27	A2	B1	C2	260288 0003	291,-
80	6	40	0	7	RD..12T3..	50	6	3.0	27	A2	B1	C2	260287 0005	365,-
80	6	60	7	7	RD..12T3..	52.5	6	3.0	27	A2	B1	C2	260288 0004	365,-

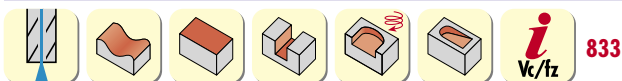
2174

**Spare parts**

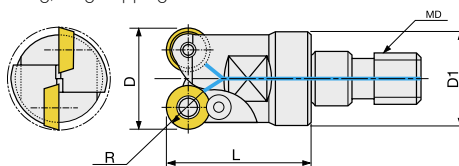
Screw			Clamping screw			TORX		
art.no.	€		art.no.	€		art.no.	€	
A1 321099 0005	4,07		B1 321099 0008	4,07		C1 703053 0080	1,93	
A2 321099 0009	4,34					C2 703053 0150	1,93	
3160			3160			7114		



palbit Copy milling cutter TOROMILL 25290 / 25390



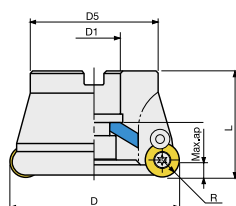
- For copy milling, radius cutting and contour milling in die and mould production
- Suitable for diagonal or axial plunge milling thanks to the clearance of the round indexable insert
- Internal coolant supply
- 7° positive setting angle for moderate and heavy machining, long-chipping materials with lower power consumption



Screw-in milling cutter

D mm	R mm	MD	Z	suitable indexable inserts	L mm	ap max. mm	Tightening torque max. N-m	D1 mm			art.no.	€
32	8	M16	2	RD..1604..	40	8	5.0	29	A1	C1	260289 0032	182,50

2174



Shell-type milling cutter

D mm	R mm	D5 mm	y	Z	suitable indexable inserts	L mm	ap max. mm	Tightening torque max. N-m	D1 mm			art.no.	€
52	8	40	0	4	RD..1604..	50	8	5.0	22	A1	B1	C1	260290 0001 243,-
52	8	48	7	4	RD..1604..	50	8	5.0	22	A1	B1	C1	260291 0001 243,-
66	8	40	0	5	RD..1604..	50	8	5.0	27	A1	B1	C1	260290 0002 285,-
66	8	60	7	5	RD..1604..	52	8	5.0	27	A1	B1	C1	260291 0002 285,-
80	8	48	0	6	RD..1604..	50	8	5.0	27	A1	B1	C1	260290 0003 360,-
80	8	60	7	6	RD..1604..	52	8	5.0	27	A1	B1	C1	260291 0003 360,-
125	8	90	7	8	RD..1604..	52	8	5.0	40	A1	B1	C1	260291 0004 609,-
160	8	120	7	9	RD..1604..	52	8	5.0	40	A1	B1	C1	260291 0005 859,-
80	10	60	7	5	RD..2006..	50	10	10.0	27	A2	B1	C1	260291 0006 445,-
100	10	70	7	6	RD..2006..	52	10	10.0	32	A2	B1	C1	260291 0007 475,-
125	10	90	7	7	RD..2006..	52	10	10.0	40	A2	B1	C1	260291 0008 579,-
160	10	120	7	8	RD..2006..	52	10	10.0	40	A2	B1	C1	260291 0009 839,-

2174

Spare parts

Screw			Washer			TORX		
	art.no.	€		art.no.	€		art.no.	€
A1	321099 0018	4,34	B1	321099 0241	4,07	C1	703053 0200	1,93
A2	321099 0429	8,70						
3160			3160			7114		



Milling inserts RD.. TOROMILL 24590 / 25090 / 25190 / 25290 / 25390

RDHT



F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	-	ISO designation									
			RDHT 1003 MOT	●						PH 6125	10 285351 0132	9,25
			RDHT 1003 MOE-LS		●			●		PHH 930	10 285351 0293	9,90
			RDHT 12T3 MOT	●						PH 6125	10 285356 0132	9,75
			RDHT 1604 MOT	●						PH 6135	10 285356 0133	9,75
			RDHT 12T3 MOS-MP	●		●				PH 6125	10 285355 0139	9,75
			RDHT 1604 MOS-MP	●	●	●		●	●	PH 6135	10 285355 0142	9,75
				●		●				PH 6740	10 285360 0139	10,55
				●	●	●		●	●	PH 6920	10 285360 0142	10,55

2170

ISO	PH 6125	PH 6135	PH 6740	PH 6920	PHH 930
ISO P steel	Vc = 130 - 190	Vc = 120 - 180	Vc = 100 - 160	Vc = 130 - 230	
ISO M stainless steel				Vc = 100 - 200	Vc = 80 - 130
ISO K cast iron			Vc = 80 - 250	Vc = 80 - 280	
ISO S superalloys				Vc = 20 - 30	Vc = 20 - 80
ISO H hard				Vc = 50 - 100	
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.45 ap = max. 5.0		fz = 0.20 - 0.45 ap = max. 6.0		fz = 0.15 - 0.45 ap = max. 5.0

Continued on next page >>>



**RDHW**

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€											
-	-	-	ISO designation																				
	RDHW 0702 MOT									PH 6103	10 285349 0131	9,25											
										PH 6910	10 285349 0141	9,25											
										PH 6920	10 285349 0142	9,25											
	RDHW 1003 MOT										PH 6103	10 285350 0131	9,25										
											PH 6135	10 285350 0133	9,25										
											PH 6910	10 285350 0141	9,25										
	RDHW 12T3 MOT										PH 6920	10 285350 0142	9,25										
											PH 6103	10 285354 0131	9,75										
											PH 6135	10 285354 0133	9,75										
	RDHW 1604 MOT										PH 6910	10 285354 0141	9,75										
											PH 6920	10 285354 0142	9,75										
											PH 6103	10 285359 0131	10,55										

2170

ISO	PH 6103	PH 6135	PH 6910	PH 6920
ISO P steel	Vc = 180 - 300	Vc = 130 - 190	Vc = 160 - 250	Vc = 130 - 230
ISO M stainless steel				Vc = 100 - 200
ISO K cast iron	Vc = 200 - 300		Vc = 90 - 300	Vc = 80 - 280
ISO S superalloys	Vc = 30 - 40			Vc = 20 - 30
ISO H hard	Vc = 120 - 240			Vc = 50 - 100
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.45 ap = max. 3.5   ap = max. 5.0   ap = max. 3.5			



**RDMT**

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	-	-	ISO designation										
	RDMT 1003 MOT									PH 6125	10 285352 0132	8,40	
										PH 6135	10 285352 0133	8,40	
	RDMT 12T3 MOT										PH 6125	10 285357 0132	9,25
											PH 6135	10 285357 0133	9,25
	RDMT 1604 MOT										PH 6125	10 285362 0132	9,75
											PH 6135	10 285362 0133	9,75
	RDMT 2006 MOT										PH 6125	10 285364 0132	15,90
											PH 6135	10 285364 0133	15,90

2170

ISO	PH 6125	PH 6135
ISO P steel	Vc = 130 - 190	Vc = 120 - 180
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.45 ap = max. 5.0	

**RDMW**

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	-	-	ISO designation										
	RDMW 1003 MOT									PH 6125	10 285353 0132	8,40	
										PH 6135	10 285353 0133	8,40	
										PH 6920	10 285353 0142	8,40	
	RDMW 12T3 MOT										PH 6125	10 285358 0132	9,25
											PH 6135	10 285358 0133	9,25
										PH 6920	10 285358 0142	9,25	
	RDMW 1604 MOT										PH 6125	10 285363 0132	9,75
											PH 6135	10 285363 0133	9,75
										PH 6920	10 285363 0142	9,75	
	RDMW 2006 MOT									PH 6125	10 285365 0132	15,90	

2170

ISO	PH 6125	PH 6135	PH 6920
ISO P steel	Vc = 130 - 190	Vc = 120 - 180	Vc = 130 - 230
ISO K cast iron			Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.45 ap = max. 5.0		



- **PFB: Radius accuracy  $\pm 6 \mu\text{m}$**
- **PFR: Surface tolerance  $+ 0 / - 20 \mu\text{m}$ , corner radius  $\pm 8 \mu\text{m}$**
- **Spiralled, stable and extremely sharp cutting edges**
- **Steel and solid carbide shanks**

**Advantages**

- Optimum surface finishes with short and long projection lengths
- Vibration reduction

### Plain ball cutter PHOENIX PFB

### Torus milling cutter PHOENIX PFR



Please contact us for more information, free of charge and without obligation.

## Ball-nose cutter PFB



837

- Radius accuracy  $\pm 6 \mu\text{m}$
- High performance
- Ball cutter for finishing
- 2 cutting edges
- **Spiralled, stable and extremely sharp cutting edges**
- Steel and solid carbide shanks
- Short, long and extra-long designs

### Advantages

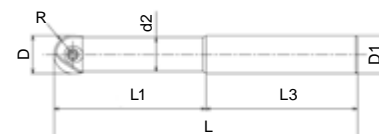
- Optimum surface finishes with short and long projecting lengths
- Vibration reduction



### Steel shank

Type	R mm	D mm	L1 mm	L3 mm	L mm	d2 mm	D1 mm	Tightening torque max. N·m			art.no.	€
PFB-R080SS08-S120	4	8	36	84	120	7	8	1.0	A2	C2	260530 0080	260,30
PFB-R100SS10-S130	5	10	45	85	130	9	10	1.2	A3	C3	260530 0100	262,50
PFB-R120SS12-S130	6	12	54	76	130	11	12	2.0	A4	C4	260530 0120	281,10
PFB-R160SS16-S140	8	16	64	76	140	14	16	3.0	A5	C5	260530 0160	285,80
PFB-R200SS20-S160	10	20	80	80	160	18	20	5.0	A6	C6	260530 0200	288,10
PFB-R250SS25-S160	12.5	25	75	85	160	22	25	5.0	A7	C6	260530 0250	332,10
PFB-R300SS32-S170	15	30	90	80	170	27	32	6.0	A8	B1	260530 0300	585,20
PFB-R320SS32-S180	16	32	96	84	180	29	32	6.0	A8	B1	260530 0320	640,70

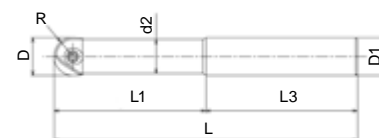
2132



### Solid carbide shank, short

Type	R mm	D mm	L1 mm	L3 mm	L mm	D1 mm	d2 mm	Tightening torque max. N·m			art.no.	€
PFB-R060SS06-S80CS	3	6	15	65	80	6	5.4	0.8	A1	C1	260531 0060	381,80
PFB-R080SS08-S100CS	4	8	20	80	100	8	7	1.0	A2	C2	260531 0080	360,-
PFB-R100SS10-S100CS	5	10	25	75	100	10	9	1.2	A3	C3	260531 0100	407,40
PFB-R120SS12-S110CS	6	12	30	80	110	12	11	2.0	A4	C4	260531 0120	427,90
PFB-R160SS16-S140CS	8	16	40	100	140	16	14	3.0	A5	C5	260531 0160	512,70
PFB-R200SS20-S160CS	10	20	50	110	160	20	18	5.0	A6	C6	260531 0200	746,90
PFB-R250SS25-S160CS	12.5	25	62.5	97.5	160	25	22	5.0	A7	C6	260531 0250	950,60
PFB-R300SS32-S170CS	15	30	75	95	170	32	27	6.0	A8	B1	260531 0300	1.184,70
PFB-R320SS32-S180CS	16	32	80	100	180	32	29	6.0	A8	B1	260531 0320	1.401,60

2132





### Solid carbide shank, long

Type	R mm	D mm	L1 mm	L3 mm	L mm	D1 mm	d2 mm	Tightening torque max. N·m			art.no.	€
PFB-R060SS06-L100CS	3	6	30	70	100	6	5.4	0.8	A1	C1	260532 0060	414,20
PFB-R080SS08-L120CS	4	8	40	80	120	8	7	1.0	A2	C2	260532 0080	432,50
PFB-R100SS10-L130CS	5	10	50	80	130	10	9	1.2	A3	C3	260532 0100	439,40
PFB-R120SS12-L140CS	6	12	60	80	140	12	11	2.0	A4	C4	260532 0120	513,40
PFB-R160SS16-L160CS	8	16	72	88	160	16	14	3.0	A5	C5	260532 0160	610,70
PFB-R200SS20-L180CS	10	20	90	90	180	20	18	5.0	A6	C6	260532 0200	902,10
PFB-R250SS25-L200CS	12.5	25	100	100	200	25	22	5.0	A7	C6	260532 0250	1.174,90
PFB-R300SS32-L220CS	15	30	120	100	220	32	27	6.0	A8	B1	260532 0300	1.575,-
PFB-R320SS32-L230CS	16	32	128	102	230	32	29	6.0	A8	B1	260532 0320	1.669,90

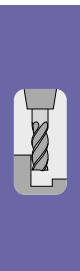
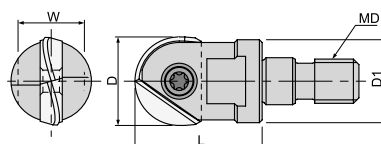
2132





## Solid carbide shank, extra-long

Type	R mm	D mm	L1 mm	L3 mm	L mm	d2 mm	D1 mm	Tightening torque max. N-m			art.no.	€
PFB-R060SS06-LL120CS	3	6	42	78	120	5.4	6	0.8	A1	C1	<b>260533 0060</b>	<b>437,20</b>
PFB-R080SS08-LL140CS	4	8	56	84	140	7	8	1.0	A2	C2	260533 0080	<b>457,40</b>
PFB-R100SS10-LL150CS	5	10	70	80	150	9	10	1.2	A3	C3	260533 0100	<b>464,20</b>
PFB-R120SS12-LL160CS	6	12	84	76	160	11	12	2.0	A4	C4	260533 0120	<b>582,80</b>
PFB-R160SS16-LL200CS	8	16	96	104	200	14	16	3.0	A5	C5	260533 0160	<b>645,40</b>
PFB-R200SS20-LL240CS	10	20	120	120	240	18	20	5.0	A6	C6	260533 0200	<b>972,70</b>
PFB-R250SS25-LL260CS	12.5	25	137.5	122.5	260	22	25	5.0	A7	C6	260533 0250	<b>1.376,50</b>
PFB-R300SS32-LL290CS	15	30	165	125	290	27	32	6.0	A8	B1	260533 0300	<b>1.972,70</b>
PFB-R320SS32-LL300CS	16	32	176	124	300	29	32	6.0	A8	B1	260533 0320	<b>2.067,80</b>

2132






## Screw-in milling cutter

Type	Tightening torque max. N-m	D mm	D1 mm	L mm	MD	W mm			art.no.	€
PFB-R100SF6	1.2	10	9	26	M6	7	A3	C3	<b>260534 0100</b>	<b>187,90</b>
PFB-R120SF6	2.0	12	11	26	M6	7	A4	C4	260534 0120	<b>194,80</b>
PFB-R160SF8	3.0	16	14.5	32	M8	10	A5	C5	260534 0160	<b>226,20</b>
PFB-R200SF10	5.0	20	18	38	M10	14	A6	C6	260534 0200	<b>251,90</b>
PFB-R250SF12	5.0	25	23	38	M12	17	A7	C6	260534 0250	<b>300,-</b>
PFB-R300SF16	6.0	30	28	43	M16	22	A8	B1	260534 0300	<b>391,40</b>

2132

## Spare parts

 TORX screw		 TORX		 TORX	
art.no.	€	art.no.	€	art.no.	€
A1 260561 9901	<b>22,20</b>	B1 703040 0300	<b>6,30</b>	C1 703053 0060	<b>1,93</b>
A2 260561 9902	<b>24,40</b>			C2 703053 0070	<b>1,93</b>
A3 260561 9903	<b>24,40</b>			C3 703053 0080	<b>1,93</b>
A4 260561 9904	<b>24,40</b>			C4 703053 0100	<b>1,93</b>
A5 260561 9905	<b>24,40</b>			C5 703053 0150	<b>1,93</b>
A6 260561 9906	<b>26,90</b>			C6 703053 0200	<b>1,93</b>
A7 260561 9907	<b>29,20</b>				
A8 260561 9908	<b>30,50</b>				

2132

7111

7114

Continued on next page &gt;&gt;&gt;

**Geometries**

**PFB-SP**

- Wide range of applications, from soft steel to superalloy
- Sharp but rigid cutting edge
- Outstanding wear resistance

**PFB-Q**

- 220° full radius
- Effective cutting edge insert
- No straight cutting edge on the outside
- Wall milling without rattling

**PFB-SH**

- Milling of cast iron and hardened steel
- Reinforced indexable cutting insert
- High-grade resistant carbide

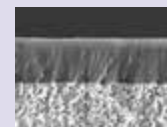
**PFB-D**

- Sharp cutting edges especially for milling graphite
- Diamond coatings for adhesive materials

**Qualities / Substrates**

**XP3320**

- for dry machining of steel and stainless steel, as well as cast iron
- for wet machining of heat-resistant superalloy



**XP3225**

- Stable milling of various materials
- Excellent lubrication and wear resistance
- For wet machining of steel and stainless steel



**XP3310**

- Ideal for dry machining of hardened steel and cast iron
- Excellent heat and wear resistance



**XC4505**

- Machining of non-ferrous materials
- Optimal diamond coating for milling graphite

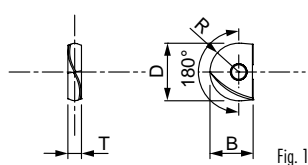
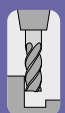
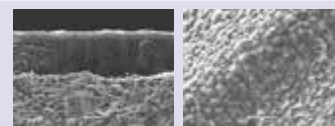


Fig. 1

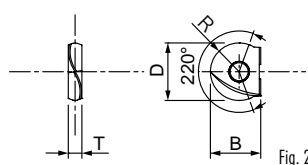


Fig. 2

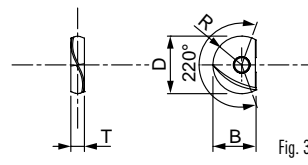


Fig. 3



**Type SP**

Type	D mm	R mm	T mm	B mm	Illustration	ISO <b>P M N S</b>		ISO <b>P M K S H</b>	
						art.no.	€	art.no.	€
PFB080-SP	8	4	2.4	7	1	<b>260600</b> 0080	<b>41,70</b>	<b>260601</b> 0080	<b>41,70</b>
PFB100-SP	10	5	2.6	8.5	1	260600 0100	<b>43,70</b>	260601 0100	<b>43,70</b>
PFB120-SP	12	6	3	10	1	260600 0120	<b>46,60</b>	260601 0120	<b>46,60</b>
PFB160-SP	16	8	4	12	1	260600 0160	<b>48,30</b>	260601 0160	<b>48,30</b>
PFB200-SP	20	10	5	15	1	260600 0200	<b>50,40</b>	260601 0200	<b>50,40</b>
PFB250-SP	25	12.5	6	18.5	1	260600 0250	<b>57,10</b>	260601 0250	<b>57,10</b>
PFB300-SP	30	15	7	22.5	1	260600 0300	<b>72,60</b>	260601 0300	<b>72,60</b>
						2133		2133	

**Type SH**

Type	D mm	R mm	T mm	B mm	Illustration	ISO <b>K H</b>	
						art.no.	€
PFB060-SH	6	3	2	5	2	<b>260602</b> 0060	<b>36,70</b>
PFB080-SH	8	4	2.4	7	1	260602 0080	<b>41,70</b>
PFB100-SH	10	5	2.6	8.5	1	260602 0100	<b>43,70</b>
PFB120-SH	12	6	3	10	1	260602 0120	<b>46,60</b>
PFB160-SH	16	8	4	12	1	260602 0160	<b>48,30</b>
PFB200-SH	20	10	5	15	1	260602 0200	<b>50,40</b>
PFB250-SH	25	12.5	6	18.5	1	260602 0250	<b>57,10</b>
PFB300-SH	30	15	7	22.5	1	260602 0300	<b>72,60</b>
PFB320-SH	32	16	7	23.5	1	260602 0320	<b>80,40</b>
						2133	

**Type D**

• **dijamantski obloženi**

Type	D mm	R mm	T mm	B mm	Illustration	ISO <b>N</b>	
						art.no.	€
PFB060-D	6	3	2	5	2	<b>260603</b> 0060	<b>108,20</b>
PFB070-D	7	3.5	2	5.5	2	260603 0070	<b>111,90</b>
PDF080-D	8	4	2.4	7	1	260603 0080	<b>121,40</b>
PFB100-D	10	5	2.6	8.5	1	260603 0100	<b>127,-</b>
PFB120-D	12	6	3	10	1	260603 0120	<b>135,80</b>
PFB160-D	16	8	4	12	1	260603 0160	<b>140,90</b>
PFB200-D	20	10	5	15	1	260603 0200	<b>146,60</b>
PFB250-D	25	12.5	6	18.5	1	260603 0250	<b>167,60</b>
PFB300-D	30	15	7	22.5	1	260603 0300	<b>212,60</b>
						2133	

**Type Q**

Type	D mm	R mm	T mm	B mm	Illustration	ISO <b>P M N S</b>	
						art.no.	€
PFB060-Q	6	3	2	5	2	<b>260604</b> 0060	<b>36,70</b>
PFB070-Q	7	3.5	2	5.5	2	260604 0070	<b>37,90</b>
PFB080-Q	8	4	2.4	7	2	260604 0080	<b>41,70</b>
PFB100-Q	10	5	2.6	8.5	2	260604 0100	<b>43,70</b>
PFB120-Q	12	6	3	10	2	260604 0120	<b>46,60</b>
PFB160-Q	16	8	4	12	3	260604 0160	<b>48,30</b>
PFB200-Q	20	10	5	15	3	260604 0200	<b>50,40</b>
PFB250-Q	25	12.5	6	18.5	3	260604 0250	<b>57,10</b>
PFB300-Q	30	15	7	22.5	3	260604 0300	<b>72,60</b>
						2133	

## Torus milling cutter PFR



839

### • Radius accuracy $\pm 8 \mu\text{m}$

- High performance
- High measurement accuracy
- 2 cutting edges
- Steel and solid carbide shanks
- Short, long and extra-long designs

### Advantages

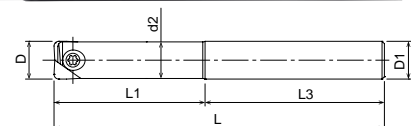
- Optimum surface finishes with short and long projecting lengths
- Vibration reduction



### Steel shank

Type	D mm	L1 mm	L3 mm	L mm	d2 mm	D1 mm	Tightening torque max. N·m			art.no.	€
PFR-R080SS08-S120	8	36	84	120	7.5	8	1.0	A1	C1	260540 0080	215,70
PFR-R100SS10-S130	10	45	85	130	9.5	10	1.2	A2	C2	260540 0100	217,80
PFR-R120SS12-S130	12	54	76	130	11.5	12	2.0	A3	C3	260540 0120	233,20
PFR-R160SS16-S140	16	64	76	140	15.5	16	3.0	A4	C4	260540 0160	237,-
PFR-R200SS20-S160	20	80	80	160	19.5	20	5.0	A5	C5	260540 0200	239,10
PFR-R250SS25-S160	25	75	85	160	24.5	25	5.0	A6	C5	260540 0250	275,60
PFR-R300SS32-S170	30	90	80	170	29.5	32	6.0	A7	B1	260540 0300	485,40
PFR-R320SS32-S180	32	96	84	180	31.5	32	6.0	A7	B1	260540 0320	533,70

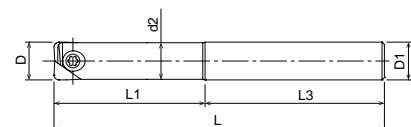
2132



### Solid carbide shank, short

Type	D mm	L1 mm	L3 mm	L mm	d2 mm	D1 mm	Tightening torque max. N·m			art.no.	€
PFR-R080SS08-S100CS	8	20	80	100	7.5	8	1.0	A1	C1	260541 0080	331,40
PFR-R100SS10-S100CS	10	25	75	100	9.5	10	1.2	A2	C2	260541 0100	337,20
PFR-R120SS12-S110CS	12	30	80	110	11.5	12	2.0	A3	C3	260541 0120	396,80
PFR-R160SS16-S140CS	16	40	100	140	15.5	16	3.0	A4	C4	260541 0160	474,10
PFR-R200SS20-S160CS	20	50	110	160	19.5	20	5.0	A5	C5	260541 0200	674,20
PFR-R250SS25-S160CS	25	62.5	97.5	160	24.5	25	5.0	A6	C5	260541 0250	878,50
PFR-R300SS32-S170CS	30	75	95	170	29.5	32	6.0	A7	B1	260541 0300	1.105,80
PFR-R320SS32-S180CS	32	80	100	180	31.5	32	6.0	A7	B1	260541 0320	1.167,50

2132



### Solid carbide shank, long

Type	D mm	L1 mm	L3 mm	L mm	d2 mm	D1 mm	Tightening torque max. N·m			art.no.	€
PFR-R080SS08-L120CS	8	40	80	120	7.5	8	1.0	A1	C1	260542 0080	355,-
PFR-R100SS10-L130CS	10	50	80	130	9.5	10	1.2	A2	C2	260542 0100	360,80
PFR-R120SS12-L140CS	12	60	80	140	11.5	12	2.0	A3	C3	260542 0120	421,50
PFR-R160SS16-L160CS	16	72	88	160	15.5	16	3.0	A4	C4	260542 0160	501,10
PFR-R200SS20-L180CS	20	90	90	180	19.5	20	5.0	A5	C5	260542 0200	740,30
PFR-R250SS25-L200CS	25	100	100	200	24.5	25	5.0	A6	C5	260542 0250	964,40
PFR-R300SS32-L220CS	30	120	100	220	29.5	32	6.0	A7	B1	260542 0300	1.300,30
PFR-R320SS32-L230CS	32	128	102	230	31.5	32	6.0	A7	B1	260542 0320	1.370,40

2132




### Solid carbide shank, extra-long

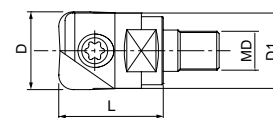
Type	D mm	L1 mm	L3 mm	L mm	d2 mm	D1 mm	Tightening torque max. N·m			art.no.	€
PFR-R080SS08-LL140CS	8	56	84	140	7.5	8	1.0	A1	C1	260543 0080	379,70
PFR-R100SS10-LL150CS	10	70	80	150	9.5	10	1.2	A2	C2	260543 0100	385,40
PFR-R120SS12-LL160CS	12	84	76	160	11.5	12	2.0	A3	C3	260543 0120	483,70
PFR-R160SS16-LL200CS	16	96	104	200	15.5	16	3.0	A4	C4	260543 0160	535,60
PFR-R200SS20-LL240CS	20	120	120	240	19.5	20	5.0	A5	C5	260543 0200	807,30
PFR-R250SS25-LL260CS	25	137.5	122.5	260	24.5	25	5.0	A6	C5	260543 0250	1.142,40
PFR-R300SS32-LL290CS	30	165	125	290	29.5	32	6.0	A7	B1	260543 0300	1.637,50
PFR-R320SS32-LL300CS	32	176	124	300	31.5	32	6.0	A7	B1	260543 0320	1.722,30

2132

Continued on next page &gt;&gt;&gt;

Screw-in milling cutter

Type	Tightening torque max. N·m	D mm	D1 mm	L mm	MD				art.no.	€
PFR-R100SF6	1.2	10	9	26	M6	A2		C2	260544 0100	158,10
PFR-R120SF6	2.0	12	11	26	M6	A3		C3	260544 0120	163,90
PFR-R160SF8	3.0	16	15	32	M8	A4		C4	260544 0160	190,50
PFR-R200SF10	5.0	20	19	38	M10	A5		C5	260544 0200	212,10
PFR-R250SF12	5.0	25	24	38	M12	A6		C5	260544 0250	252,40
PFR-R300SF16	6.0	30	29	43	M16	A7		B1	260544 0300	329,60
PFR-R320SF16	6.0	32	31	43	M16	A7		B1	260544 0320	366,20



2132

Spare parts

TORX screw		TORX		TORX	
art.no.	€	art.no.	€	art.no.	€
A1	260561 9902 24,40	B1	703040 0300 6,30	C1	703053 0070 1,93
A2	260561 9903 24,40			C2	703053 0080 1,93
A3	260561 9904 24,40			C3	703053 0100 1,93
A4	260561 9905 26,90			C4	703053 0150 1,93
A5	260561 9906 29,20			C5	703053 0200 1,93
A6	260561 9907 30,50				
A7	260561 9908 30,50				
2132		7111		7114	

Geometries

PFR-ST

- Wide range of applications from soft to hard steel
- Positive rake angle
- Excellent sharpness and hardness

PFR-SH

- For milling cast iron, ductile iron and hardened steel
- Ultra-rigid cutting edge with two-dimensional negative chamfer
- For stable machining
- Especially for milling graphite

PFR-D

- Sharp cutting edges especially for milling graphite
- Diamond coatings for adhesive materials

Qualities / Substrates

XP3225

- Stable milling of various materials
- Excellent lubrication and wear resistance
- For wet machining of steel and stainless steel



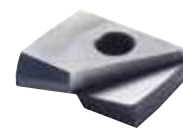
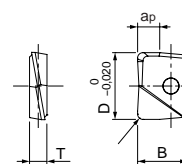
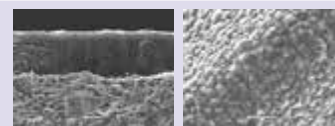
XP3310

- Ideal for dry machining of hardened steel and cast iron
- Excellent heat and wear resistance



XC4505

- Machining of non-ferrous materials
- Optimal diamond coating for milling graphite



Type ST

Type	R mm	D mm	B mm	T mm	ap mm	ISO P M K N S H	
						XP3225 art.no.	€
PFR080R03-ST	0.3	8	2.7	2.4	2.7	260650 0803	32,30
PFR080R05-ST	0.5	8	2.7	2.4	2.7	260650 0805	32,30
PFR080R10-ST	1	8	2.7	2.4	2.7	260650 0810	32,30
PFR080R20-ST	2	8	2.7	2.4	2.7	260650 0820	32,30
PFR100R03-ST	0.3	10	3.3	2.6	3.3	260650 1003	34,50
PFR100R05-ST	0.5	10	3.3	2.6	3.3	260650 1005	34,50
PFR100R10-ST	1	10	3.3	2.6	3.3	260650 1010	34,50
PFR100R20-ST	2	10	3.3	2.6	3.3	260650 1020	34,50
PFR120R03-ST	0.3	12	4	3	4	260650 1203	36,30
PFR120R05-ST	0.5	12	4	3	4	260650 1205	36,30
PFR120R10-ST	1	12	4	3	4	260650 1210	36,30
PFR120R20-ST	2	12	4	3	4	260650 1220	36,30
PFR120R30-ST	3	12	4	3	4	260650 1230	36,30
PFR160R03-ST	0.3	16	5.3	4	5.3	260650 1603	44,90
PFR160R05-ST	0.5	16	5.3	4	5.3	260650 1605	44,90

2133

Type SH

Type	R mm	D mm	B mm	T mm	ap mm	ISO P M K N S H	
						XP3310 art.no.	€
PFR080R03-SH	0.3	8	7	2.4	2.7	260651 0803	32,30
PFR080R05-SH	0.5	8	7	2.4	2.7	260651 0805	32,30
PFR080R10-SH	1	8	7	2.4	2.7	260651 0810	32,30
PFR080R20-SH	2	8	7	2.4	2.7	260651 0820	32,30
PFR100R03-SH	0.3	10	8.5	2.6	3.3	260651 1003	34,50
PFR100R05-SH	0.5	10	8.5	2.6	3.3	260651 1005	34,50
PFR100R10-SH	1	10	8.5	2.6	3.3	260651 1010	34,50
PFR100R20-SH	2	10	8.5	2.6	3.3	260651 1020	34,50
PFR120R03-SH	0.3	12	10	3	4	260651 1203	36,30
PFR120R05-SH	0.5	12	10	3	4	260651 1205	36,30
PFR120R10-SH	1	12	10	3	4	260651 1210	36,30
PFR120R20-SH	2	12	10	3	4	260651 1220	36,30
PFR120R30-SH	3	12	10	3	4	260651 1230	36,30
PFR160R03-SH	0.3	16	12	4	5.3	260651 1603	44,90
PFR160R05-SH	0.5	16	12	4	5.3	260651 1605	44,90

2133

ISO **P M K N S H**

Type	R mm	D mm	B mm	T mm	ap mm	XP3225	
						art.no.	€
PFR160R10-ST	1	16	5.3	4	5.3	260650 1610	44,90
PFR160R20-ST	2	16	5.3	4	5.3	260650 1620	44,90
PFR160R30-ST	3	16	5.3	4	5.3	260650 1630	44,90
PFR200R03-ST	0.3	20	6.7	5	6.7	260650 2003	47,10
PFR200R05-ST	0.5	20	6.7	5	6.7	260650 2005	47,10
PFR200R10-ST	1	20	6.7	5	6.7	260650 2010	47,10
PFR200R20-ST	2	20	6.7	5	6.7	260650 2020	47,10
PFR200R30-ST	3	20	6.7	5	6.7	260650 2030	47,10
PFR250R03-ST	0.3	25	8.3	6	8.3	260650 2503	55,50
PFR250R05-ST	0.5	25	8.3	6	8.3	260650 2505	55,50
PFR250R10-ST	1	25	8.3	6	8.3	260650 2510	55,50
PFR250R20-ST	2	25	8.3	6	8.3	260650 2520	55,50
PFR250R30-ST	3	25	8.3	6	8.3	260650 2530	55,50
PFR300R03-ST	0.3	30	10	7	10	260650 3003	86,90
PFR300R05-ST	0.5	30	10	7	10	260650 3005	86,90
PFR300R10-ST	1	30	10	7	10	260650 3010	86,90
PFR300R20-ST	2	30	10	7	10	260650 3020	86,90
PFR300R30-ST	3	30	10	7	10	260650 3030	86,90
PFR320R03-ST	0.3	32	10.3	7	10.3	260650 3203	93,60
PFR320R05-ST	0.5	32	10.3	7	10.3	260650 3205	93,60
PFR320R10-ST	1	32	10.3	7	10.3	260650 3210	93,60
PFR320R20-ST	2	32	10.3	7	10.3	260650 3220	93,60
PFR320R30-ST	3	32	10.3	7	10.3	260650 3230	93,60

2133

ISO **P M K N S H**

Type	R mm	D mm	B mm	T mm	ap mm	XP3310	
						art.no.	€
PFR160R10-SH	1	16	12	4	5.3	260651 1610	44,90
PFR160R20-SH	2	16	12	4	5.3	260651 1620	44,90
PFR160R30-SH	3	16	12	4	5.3	260651 1630	44,90
PFR200R03-SH	0.3	20	15	5	6.7	260651 2003	47,10
PFR200R05-SH	0.5	20	15	5	6.7	260651 2005	47,10
PFR200R10-SH	1	20	15	5	6.7	260651 2010	47,10
PFR200R20-SH	2	20	15	5	6.7	260651 2020	47,10
PFR200R30-SH	3	20	15	5	6.7	260651 2030	47,10
PFR250R03-SH	0.3	25	18.5	6	8.3	260651 2503	55,50
PFR250R05-SH	0.5	25	18.5	6	8.3	260651 2505	55,50
PFR250R10-SH	1	25	18.5	6	8.3	260651 2510	55,50
PFR250R20-SH	2	25	18.5	6	8.3	260651 2520	55,50
PFR250R30-SH	3	25	18.5	6	8.3	260651 2530	55,50
PFR300R03-SH	0.3	30	22.5	7	10	260651 3003	86,90
PFR300R05-SH	0.5	30	22.5	7	10	260651 3005	86,90
PFR300R10-SH	1	30	22.5	7	10	260651 3010	86,90
PFR300R20-SH	2	30	22.5	7	10	260651 3020	86,90
PFR300R30-SH	3	30	22.5	7	10	260651 3030	86,90
PFR320R03-SH	0.3	32	23.5	7	10.3	260651 3203	93,60
PFR320R05-SH	0.5	32	23.5	7	10.3	260651 3205	93,60
PFR320R10-SH	1	32	23.5	7	10.3	260651 3210	93,60
PFR320R20-SH	2	32	23.5	7	10.3	260651 3220	93,60
PFR320R30-SH	3	32	23.5	7	10.3	260651 3230	93,60

2133

## Type D diamond-coated

ISO **N**

Type	R mm	D mm	B mm	T mm	ap mm	XC4505	
						art.no.	€
PFR080R05-D	0.5	8	7	2.4	2.7	260652 0805	136,90
PFR080R10-D	1	8	7	2.4	2.7	260652 0810	136,90
PFR100R03-D	0.3	10	8.5	2.6	3.3	260652 1003	149,70
PFR100R05-D	0.5	10	8.5	2.6	3.3	260652 1005	149,70
PFR100R10-D	1	10	8.5	2.6	3.3	260652 1010	149,70
PFR120R03-D	0.3	12	10	3	4	260652 1203	164,50
PFR120R05-D	0.5	12	10	3	4	260652 1205	164,50

2133

ISO **N**

Type	R mm	D mm	B mm	T mm	ap mm	XC4505	
						art.no.	€
PFR120R10-D	1	12	10	3	4	260652 1210	164,50
PFR160R03-D	0.3	16	12	4	5.3	260652 1603	180,20
PFR160R05-D	0.5	16	12	4	5.3	260652 1605	180,20
PFR160R10-D	1	16	12	4	5.3	260652 1610	180,20
PFR200R03-D	0.3	20	15	5	6.7	260652 2003	189,70
PFR200R05-D	0.5	20	15	5	6.7	260652 2005	189,70
PFR200R10-D	1	20	15	5	6.7	260652 2010	189,70

2133

# DRILLING THREADING MILLING



OSG  
Catalogue VI  
1024 pages  
Art.no. 019900 0208

Overview of all free manufacturers' catalogues  
on page 16/17

## ATORN® Countersinking mill, adjustable

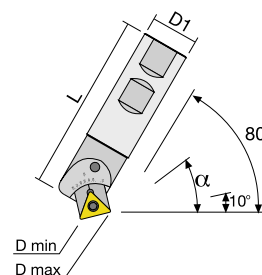
- **Adjustable from 10° to 80°**
- Universal indexable insert countersinking mill for chamfering, deburring and countersinking in fixed operating conditions. Cannot be used on drilling machines
- Stable, smooth operation
- Straight shank with driving planes in accordance with DIN 1835B in tolerance zone h6
- Scale tolerance  $\pm 2.5^\circ$ , please use a pre-setting device for precise adjustment
- Supplied with clamping screws and wrench



### For ISO indexable inserts, type TC.. 1102

- incl. cartridge

D1 mm	L mm	$\alpha$ °	D min. mm	D max. mm	Tightening torque max. N-m	suitable indexable inserts	art.no.	€
20	95	10°	5.0	26.0	1	TC..1102	A1 B1 C1 D1	260122 0020 255,-
		20°	8.0	27.0				
		30°	10.0	27.0				
		40°	13.0	27.0				
		45°	14.0	27.0				
		50°	15.0	27.0				
		60°	17.0	26.0				
		70°	19.0	25.0				
80°	20.0	24.0						



2124

### Spare parts

Cartridge			Screw			Screw for cartridge			TORX		
art.no.	€		art.no.	€		art.no.	€		art.no.	€	
A1	320901 2001	93,10	B1	320901 2002	9,75	C1	320901 2003	9,75	D1	703053 0080	1,93
3106			3106			3106			7114		

## ATORN® Countersinking mill with 2 cartridges, adjustable

- **Adjustable from 10° to 80°**
- Universal indexable insert countersinking mill for chamfering, deburring and countersinking in fixed operating conditions. Cannot be used on drilling machines. Stable, smooth operation
- Straight shank with driving planes in accordance with DIN 1835B in tolerance zone h6
- Scale tolerance  $\pm 2.5^\circ$ , please use a pre-setting device for precise adjustment
- Supplied with clamping screws and wrench



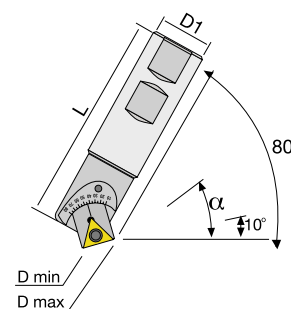
Cartridge for SC.. 1204..



Cartridge for TC.. 16T3..

### Including two cartridges, one cartridge each for TCMT 16T3.. and SCMT 1204..

D1 mm	L mm	$\alpha$ °	D min. mm	D max. mm	Tightening torque max. N-m	suitable indexable inserts	art.no.	€
25	95	10°	5.0	32.0	4.01	TC..16T3 / SC..1204	260123 0025	305,-
		20°	6.0	33.0				
		30°	7.0	34.0				
		40°	10.0	33.0				
		45°	11.0	33.0				
		50°	13.0	32.0				
		60°	16.0	31.0				
		70°	19.0	29.0				
80°	23.0	27.0						



2124

### Spare cartridges

Description	art.no.	€
Cartridge for SCMT1204..	A1	260124 0012 90,60
Cartridge for TCMT16T3..	A2	260124 0016 90,60



260124 0012


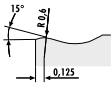
260124 0016

3106

### Spare parts

Screw			Screw for cartridge			TORX		
art.no.	€		art.no.	€		art.no.	€	
A1	260124 0002	9,50	B1	260124 0010	11,40	C1	703053 0150	1,93
A2	320901 2502	11,65				C2	703053 0200	1,93
3106			3106			7114		


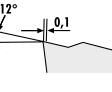
Chip breaker type MP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	☞	art.no.	€
-	●	-	ISO designation										
 <p>Medium machining</p> 			TCMT 16T304-MP	●		○				HC 7610	10	311501 3411	9,10
				●		○			HC 7620	10	311501 3412	9,10	
				●					HC 7630	10	311501 3413	9,10	
				●		○			HC 7610	10	311501 3511	9,10	
				●		○			HC 7620	10	311501 3512	9,10	
				●					HC 7630	10	311501 3513	9,10	

3147

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 110 - 250	Vc = 110 - 250	Vc = 110 - 250
ISO K cast iron	Vc = 140 - 240	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.4 - 3.0		


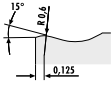
Chip breaker type MP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	☞	art.no.	€
-	●	-	ISO designation										
 <p>Medium machining</p> 			SCMT 120404-MP	●		○				HC 7620	10	311401 2612	10,80
			SCMT 120408-MP	●		○					HC 7620	10	311401 2712

3147

ISO	HC 7620
ISO P steel	Vc = 110 - 250
ISO K cast iron	Vc = 140 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.35 ap = 0.1 - 3.0


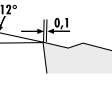
Chip breaker type MP, stainless steel

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	☞	art.no.	€
-	●	-	ISO designation										
 <p>Medium machining</p> 			TCMT 16T304-MP		●			○		HC 7520	10	310501 3425	9,10
			TCMT 16T308-MP		●			○		HC 7520	10	310501 3525	9,10
					●			○		HC 7530	10	310501 3526	9,10

3147

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 80 - 210	Vc = 90 - 160
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.4 - 3.0	

Chip breaker type MP, stainless steel

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	☞	art.no.	€
-	●	-	ISO designation										
 <p>Medium machining</p> 			SCMT 120408-MP		●			○		HC 7520	10	311401 2722	10,80

3147

ISO	HC 7520
ISO M stainless steel	Vc = 80 - 220
ISO S superalloys	Vc = 30 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.32 ap = 0.5 - 2.5

Continued on next page >>>



**Chip breaker FFP Cermet version**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ISO designation			ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
<p>Micro finishing</p>	TCGT 110202-FFP			●	○	○				ATU 10 T	10 366666 0140	12,95
	TCMT 110204-FFP			●	○	○					ATU 10 T	10 366666 0240
<b>ISO P</b>												

3135

ISO	ATU 10 T
<b>ISO P</b> steel	Vc = 160 - 300
<b>ISO M</b> stainless steel	Vc = 130 - 240
<b>ISO K</b> cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.65

**Chip breaker MP5**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ISO designation			ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
<p>Medium machining</p>	SCMT 120404-MP5			●	○	○				ACP 25 T	10 366649 0525	11,35
	SCMT 120408-MP5			●	○	○					ACP 25 T	10 366649 0625
<b>ISO P</b>												

3135

ISO	ACP 25 T
<b>ISO P</b> steel	Vc = 100 - 240
<b>ISO M</b> stainless steel	Vc = 70 - 210
<b>ISO K</b> cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5

**Chip breaker MM3, especially for stainless steel**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ISO designation			ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
<p>Medium machining</p>	SCMT 120404-MM3			○	●					APM 25 T	10 366650 0321	11,35
	SCMT 120408-MM3			○	●						APM 25 T	10 366650 0421
<b>ISO M</b>												

3135

ISO	APM 25 T
<b>ISO P</b> steel	Vc = 60 - 250
<b>ISO M</b> stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5

**Chip breaker MP5**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
ISO designation			ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€		
<p>Medium machining</p>	TCMT 16T304-MP5			●	○	○				ACP 25 T	10 366665 0625	9,55	
				●	○				ACP 35 T	10 366665 0735	9,55		
	TCMT 16T308-MP5			●	○	○					ACP 25 T	10 366665 0825	9,55
				●	○				ACP 35 T	10 366665 0935	9,55		

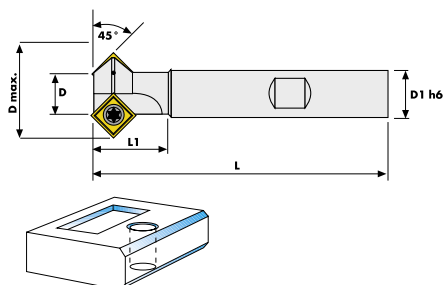
3135

ISO	ACP 25 T	ACP 35 T
<b>ISO P</b> steel	Vc = 100 - 240	Vc = 90 - 200
<b>ISO M</b> stainless steel	Vc = 70 - 210	Vc = 55 - 200
<b>ISO K</b> cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5	



## ATORN® 30°/45°/60° chamfer cutter, SCMT and TCMT



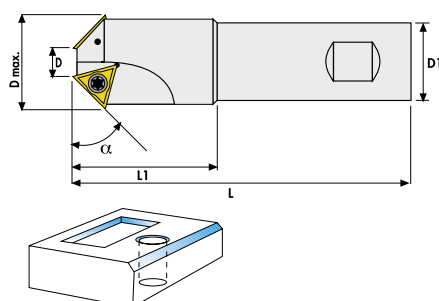
- With Weldon shank
- Suitable for bore diameters from Ø 12 mm
- Uses ISO indexable cutting inserts SCMT.. and TCMT..
- **Internal coolant supply**





### 45° SCMT.. with IC

D mm	D max. mm	L mm	L1 mm	D1 h6 mm	Z	Tightening torque max. N-m	suitable indexable inserts	suitable clamping screw	suitable TORX wrench			art.no.	€
4.0	12	80	28	12.0	1	1	SCMT 0602..	M 2.5 x 5.5	TX 8	A3	B1	<b>260121 0001</b>	<b>118,-</b>
11.0	20.0	80	32	12.0	2	1	SCMT 0602..	M 2.5 x 5.5	TX 8	A3	B1	260121 0002	175,-
12.0	23.7	100	37	20.0	1	4	SCMT 09T3..	M 4.0 x 8	TX 15	A2	B2	260121 0003	101,-
12.0	23.7	200	37	20.0	1	4	SCMT 09T3..	M 4.0 x 8	TX 15	A2	B2	260121 1001	119,-
16.0	28.8	100	32	16.0	2	4	SCMT 09T3..	M 4.0 x 8	TX 15	A2	B2	260121 0004	157,-
16.0	28.8	200	32	16.0	2	4	SCMT 09T3..	M 4.0 x 8	TX 15	A2	B2	260121 1002	179,-
30.0	42.3	100	32	20.0	3	4	SCMT 09T3..	M 4.0 x 8	TX 15	A2	B2	260121 0005	182,50
30.0	42.3	200	32	20	3	4	SCMT 09T3..	M 4.0 x 8	TX 15	A2	B2	260121 1003	206,-

2124





### 30° 45° 60° TCMT.. with internal cooling

D mm	D max. mm	L mm	L1 mm	D1 h6 mm	α °	Z	suitable indexable inserts	Tightening torque max. N-m	suitable clamping screw	suitable TORX wrench			art.no.	€
1.2	16.0	70	20	12.0	45°	1	TCMT 1102..	1	M 2.5 x 5.5	TX 8	A3	B1	<b>260125 4516</b>	<b>79,40</b>
5.4	16.0	70	20	12.0	60°	1	TCMT 1102..	1	M 2.5 x 5.5	TX 8	A3	B1	260125 6016	82,40
6.0	32.0	100	38	25.0	30°	2	TCMT 16T3..	4	M 4.0 x 8	TX 15	A2	B2	260125 3032	182,50
6.2	21.0	90	35	20.0	45°	2	TCMT 1102..	1	M 2.5 x 5.5	TX 8	A1	B1	260125 4521	108,-
10.4	32.5	100	42	25.0	45°	2	TCMT 16T3..	4	M 4.0 x 8	TX 15	A2	B2	260125 4532	178,-
15.8	26.0	90	35	20.0	60°	2	TCMT 1102..	1	M 2.5 x 5.5	TX 8	A1	B1	260125 6026	109,-
20.0	35.0	100	39	25.0	60°	2	TCMT 16T3..	4	M 4.0 x 8	TX 15	A2	B2	260125 6035	182,50

2124

### Spare parts


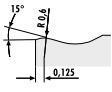
Screw			TORX		
	art.no.	€		art.no.	€
	A1 262551 0025	5,45		B1 703053 0080	1,93
	A2 320901 2502	11,65		B2 703053 0150	1,93
	A3 320901 2513	11,65			

3106

7114

Continued on next page &gt;&gt;&gt;

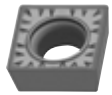
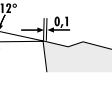
Chip breaker type MP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	•	-	ISO designation										
 <p>Medium machining</p> 	TCMT 110204-MP	●		○						HC 7610	10 311501 1511	7,10	
		●		○							HC 7620	10 311501 1512	7,10
		●									HC 7630	10 311501 1513	7,10
	TCMT 16T304-MP	●		○							HC 7610	10 311501 3411	9,10
		●		○							HC 7620	10 311501 3412	9,10
		●									HC 7630	10 311501 3413	9,10
	TCMT 16T308-MP	●		○							HC 7610	10 311501 3511	9,10
		●		○							HC 7620	10 311501 3512	9,10
		●									HC 7630	10 311501 3513	9,10

3147

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 110 - 250	Vc = 110 - 250	Vc = 110 - 250
ISO K cast iron	Vc = 140 - 240	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.4 - 3.0		


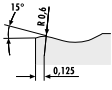
Chip breaker type MP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	•	-	ISO designation										
 <p>Medium machining</p> 	SCMT 09T304-MP	●		○						HC 7620	10 311401 1212	8,75	
		●									HC 7630	10 311401 1213	8,75
	SCMT 09T308-MP	●		○							HC 7620	10 311401 1312	8,75
		●									HC 7630	10 311401 1313	8,75
	SCMT 120404-MP	●		○							HC 7620	10 311401 2612	10,80
SCMT 120408-MP	●		○							HC 7620	10 311401 2712	10,80	

3147

ISO	HC 7620	HC 7630
ISO P steel	Vc = 110 - 250	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.35 ap = 0.1 - 3.0	


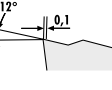
Chip breaker type MP, stainless steel

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	•	-	ISO designation										
 <p>Medium machining</p> 	TCMT 110204-MP		●					○		HC 7520	10 310501 1525	7,10	
		TCMT 16T304-MP		●						○		HC 7520	10 310501 3425
	TCMT 16T308-MP			●						○		HC 7520	10 310501 3525
				●						○		HC 7530	10 310501 3526

3147

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 80 - 210	Vc = 90 - 160
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.4 - 3.0	

Chip breaker type MP, stainless steel

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	•	-	ISO designation									
 <p>Medium machining</p> 	SCMT 09T308-MP		●					○		HC 7520	10 311401 1322	8,75
	SCMT 120408-MP		●					○		HC 7520	10 311401 2722	10,80

3147

ISO	HC 7520
ISO M stainless steel	Vc = 80 - 220
ISO S superalloys	Vc = 30 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.32 ap = 0.5 - 2.5

**Chip breaker FFP Cermet version**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
<p>Micro finishing</p>			TCGT 110202-FFP	●	○	○				ATU 10 T	10 366666 0140	12,95
			TCMT 110204-FFP	●	○	○				ATU 10 T	10 366666 0240	7,45
<b>ISO P</b>												

3135

ISO	ATU 10 T
<b>ISO P</b> steel	Vc = 160 - 300
<b>ISO M</b> stainless steel	Vc = 130 - 240
<b>ISO K</b> cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.65

**Chip breaker MP5**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
<p>Medium machining</p>		○	SCMT 09T304-MP5	●	○	○				ACP 25 T	10 366649 0125	9,25
		●	SCMT 09T308-MP5	●	○	○				ACP 25 T	10 366649 0225	9,25
		○	SCMT 120404-MP5	●	○	○				ACP 25 T	10 366649 0525	11,35
		○	SCMT 120408-MP5	●	○	○				ACP 25 T	10 366649 0625	11,35
	<b>ISO P</b>											

3135

ISO	ACP 25 T	ACP 35 T
<b>ISO P</b> steel	Vc = 100 - 240	Vc = 90 - 190
<b>ISO M</b> stainless steel	Vc = 70 - 210	Vc = 55 - 200
<b>ISO K</b> cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5	

**Chip breaker MM3, especially for stainless steel**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
<p>Medium machining</p>		○	SCMT 09T304-MM3	○	●					APM 25 T	10 366650 0121	9,25
		○	SCMT 09T308-MM3	○	●					APM 25 T	10 366650 0221	9,25
		○	SCMT 120404-MM3	○	●					APM 25 T	10 366650 0321	11,35
		○	SCMT 120408-MM3	○	●					APM 25 T	10 366650 0421	11,35
<b>ISO M</b>												

3135

ISO	APM 25 T
<b>ISO P</b> steel	Vc = 60 - 250
<b>ISO M</b> stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5

**Chip breaker MP5**


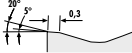
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
<p>Medium machining</p>		○	TCMT 110204-MP5	●	○	○				ACP 25 T	10 366665 0225	7,45
		●		●	○	○				ACP 35 T	10 366665 0325	7,45
		○	TCMT 16T304-MP5	●	○	○				ACP 25 T	10 366665 0625	9,55
		○		●	○	○			ACP 35 T	10 366665 0735	9,55	
		○	TCMT 16T308-MP5	●	○	○				ACP 25 T	10 366665 0825	9,55
		○		●	○	○			ACP 35 T	10 366665 0935	9,55	

3135

ISO	ACP 25 T	ACP 35 T
<b>ISO P</b> steel	Vc = 100 - 240	Vc = 90 - 200
<b>ISO M</b> stainless steel	Vc = 70 - 210	Vc = 55 - 200
<b>ISO K</b> cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5	

Continued on next page >>>

SCMT

<b>F</b> finishing ●	<b>M</b> medium ●	<b>R</b> roughing -	<b>ATORN®</b> ISO designation	<b>ISO P</b>	<b>ISO M</b>	<b>ISO K</b>	<b>ISO N</b>	<b>ISO S</b>	<b>ISO H</b>	<b>Quality</b>	art.no.	€
 <b>Finishing/medium machining</b> 			SCMT 060204	●						<b>HC 4635</b>	10 <b>327410</b> 1510	<b>19,65</b>

<b>ISO</b>	<b>HC 4635</b>
<b>ISO P</b> steel	Vc = 60 - 160
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.4 ap = max. 0.7 x cutting edge length

2129

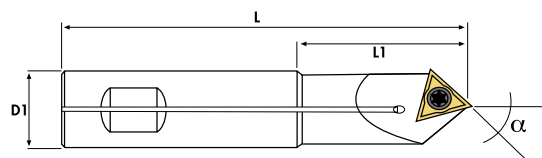
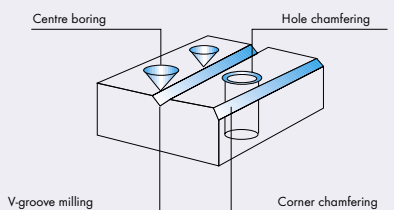
**ATORN® 45° chamfer and centring cutter**



- **Internal coolant supply**
- NC spot drilling, engraving, chamfering, centring, V-groove milling
- **When used for chamfering only, an ISO turning insert of type TCMX 16T3.. can be utilised instead**



Suitable for use as standing tool on turning machines for facing




D1 h6 mm	L mm	L1 mm	α °	Z	D min. mm	D max. mm	suitable indexable inserts	Tightening torque max. N-m			art.no.	€
20	115	40	45°	1	0.4	20.0	TCMX 16T3ZR..	4	A1	B1	<b>260126</b> 4540	<b>179,-</b>
20	150	60	45°	1	0.4	20.0	TCMX 16T3ZR..	4	A1	B1	260126 4560	<b>207,-</b>
20	200	80	45°	1	0.4	20.0	TCMX 16T3ZR..	4	A1	B1	260126 4580	<b>237,-</b>

2124

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	320901 2502	<b>11,65</b>	B1	703053 0150	<b>1,93</b>
	3106			7114	

Turning insert for centring

<b>F</b> finishing ●	<b>M</b> medium ●	<b>R</b> roughing ●	<b>ATORN®</b> ISO designation	<b>ISO P</b>	<b>ISO M</b>	<b>ISO K</b>	<b>ISO N</b>	<b>ISO S</b>	<b>ISO H</b>	<b>Quality</b>	art.no.	€
 <b>Universal application</b>			TCMX 16T3ZR	●	●	●				<b>HC 4625</b>	10 <b>260127</b> 1603	<b>16,80</b>
				●	●	●				<b>HC 4630</b>	10 260127 1613	<b>17,80</b>

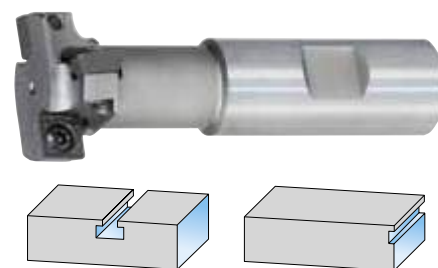
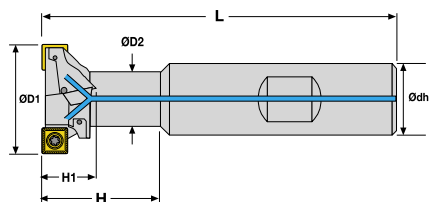
<b>ISO</b>	<b>HC 4625</b>	<b>HC 4630</b>
<b>ISO P</b> steel	Vc = 30 - 70	Vc = 30 - 70
<b>ISO M</b> stainless steel	Vc = 30 - 50	Vc = 30 - 50
<b>ISO K</b> cast iron	Vc = 50 - 90	Vc = 50 - 90
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.02 - 0.04 per cutting edge ap = 0.5 - 1.5	

2129

# ATORN® T-slot milling cutter



- For T-slots in accordance with **DIN 650-UNI 4788-ISO 299**
- Straight shank with driving plane
- For ISO milling inserts, type SPMT...
- Supplied with clamping screws and wrench



D1 mm	D2 mm	L mm	H mm	H1 mm	D h6 mm	Z	Tightening torque max. N-m	suitable indexable inserts	art.no.	€
21	11	76	26	9	16	2	1.0	SPMT 060304	A1 B1	263007 0021 303,-
25	13	82	31	11	16	4	1.0	SPMT 060304	A1 B1	263007 0025 360,-
32	17	88	38	14	20	4	2.68	SPMT 09T308	A2 B2	263007 0032 390,-
40	21	108	50	17	25	4	2.68	SPMT 09T308	A2 B2	263007 0040 415,-
50	27	120	56	22	32	4	7.93	SPMT 120408	A3 B3	263007 0050 475,-

2124

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
	A1 262551 0025	5,45		B1 703053 0080	1,93
	A2 262551 0035	7,95		B2 703053 0150	1,93
	A3 321701 0108	9,75		B3 703053 0200	1,93
	3106			7114	

### SPMT

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	ISO designation							HC 4635	10		
<p>Finishing/medium machining</p>			SPMT 060304	●	●	○				HC 4635	10	263008 0006 11,40	
			SPMT 09T308	●	●	○					HC 4635	10	263008 0009 12,30
			SPMT 120408	●	●	○					HC 4635	10	263008 0012 13,55

2131

ISO	HC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.15 ap = 0.5 - 4.0

### SPGT ALU

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	ISO designation							HW 4415	10		
<p>Universal application</p>			SPGT 060304 ALU				●			HW 4415	10	263009 0006 13,45	
			SPGT 09T308 ALU				●				HW 4415	10	263009 0009 14,45
			SPGT 120408 ALU				●					HW 4415	10

2131

ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.20 ap = 0.5 - 2.0

## Milling insert geometries

INFO

ISO designation codes  
in the INFO section

AP...

from page  
727

SP...

from page  
733

SC...

from page  
731

LN...

from page  
734

SE...

from page  
732

WHEN  
**ADDITIVE**  
IS A FAMILIAR WORD IN  
**MANUFACTURING.**

THAT'S POWER TO PRODUCE



**SARATOOLS.com**


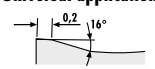
**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE




ISO milling inserts APKT / APMX / APMT / ADKT / APKR / APHX

APKT

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <p><b>Universal application</b></p> 			APKT 060204 PDTR-K	●	●	●				HC 4635	10 281518 0609	9,15


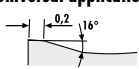
2129

APMX

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
			APMX 0602	●	●	●				HC 4635	10 281525 0602	14,75
				●						HC 4410	10 281525 0605	14,75
				●	●					HC 4535	10 281525 0607	14,75


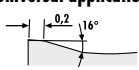
2129

APMT 10

F finishing	M medium	R roughing	<b>SARA®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <p><b>Universal application</b></p> 			APMT 1003 PDER-M	●	●	●				SC 4635	10 281516 3009	6,65


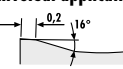
2167

APMT 16

F finishing	M medium	R roughing	<b>SARA®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <p><b>Universal application</b></p> 			APMT 1604 PDER-M	●	●	●				SC 4635	10 281517 3009	8,10

2167

APKT

F finishing	M medium	R roughing	<b>Duracarb®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <p><b>Universal application</b></p> 			APKT 1003 PDSR	●	●	●				DC 9235	10 281513 1049	12,95

2167

ISO	HC 4635
ISO P steel	Vc = 70 - 130
ISO M stainless steel	Vc = 60 - 100
ISO K cast iron	Vc = 120 - 200
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.03 - 0.25 per cutting edge ap = 0.1 - 3.0

ISO	HC 4410	HC 4535	HC 4635
ISO K cast iron			Vc = 120 - 330
ISO M stainless steel		Vc = 120 - 180	Vc = 100 - 160
ISO P steel	Vc = 160 - 250	Vc = 140 - 230	Vc = 160 - 220
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.4 - 0.6 ap = 0.3		



ISO	SC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 per cutting edge ap = max. 0.7 x cutting edge length

ISO	SC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 per cutting edge ap = max. 0.7 x cutting edge length

ISO	DC 9235
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

Continued on next page >>>

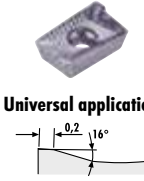

**APKT**

F finishing	M medium	R roughing	<b>ATORN®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
 <p>Universal application</p>										HC 4615	10	281514 3005	9,95
										HC 4535	10	281514 3007	9,95
										HC 4635	10	281514 3009	9,95
										HC 4615	10	281514 3205	11,30
										HC 4535	10	281514 3207	11,30
										HC 4635	10	281514 3209	11,30

2129

ISO	HC 4535	HC 4615	HC 4635
ISO P steel	Vc = 100 - 170	Vc = 180 - 280	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130		Vc = 90 - 160
ISO K cast iron		Vc = 160 - 270	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]		fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length	



**APKT**

F finishing	M medium	R roughing	<b>SARA®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
 <p>Universal application</p>										SP 35 PM	10	281519 1010	9,15
										SP 35 MM	10	281519 1020	9,15
										SP 35 SM	10	281519 1030	9,15
										SP 35 PM	10	281519 1610	10,70
										SP 35 MM	10	281519 1620	10,70
										SP 35 SM	10	281519 1630	10,70

2167

ISO	SP 35 MM	SP 35 PM	SP 35 SM
ISO P steel		Vc = 60 - 220	
ISO M stainless steel	Vc = 60 - 200		
ISO S superalloys			Vc = 25 - 75
Vc = [m/min] fz = [mm/Z] ap = [mm]		fz = 0.08 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	



**APKT Radius**

F finishing	M medium	R roughing	<b>ATORN®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
 <p>Universal application</p>										HC 4540	10	281514 4011	12,95
										HC 4540	10	281514 4012	12,95
										HC 4540	10	281514 4013	12,95

2129

ISO	HC 4540
ISO P steel	Vc = 70 - 130
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	
fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length	



**APKT Radius**

F finishing	M medium	R roughing	<b>SARA®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
 <p>Universal application</p>										SP 35 P	10	281522 1610	14,50
										SP 35 P	10	281522 2410	14,50
										SP 35 P	10	281522 3210	14,50
										SP 35 P	10	281522 4810	14,50

2167

ISO	SP 35 P
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] f = [mm/U] ap = [mm]	
fz = 0.1 - 0.4 ap = max. 0.7 x cutting edge length	


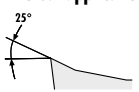
**APKR specially for non-ferrous metals**

F finishing	M medium	R roughing	<b>ATORN®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
 <p>Universal application</p>										HW 4415	10	281715 0025	16,-
										HW 4415	10	281715 0030	17,60

2129

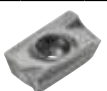
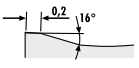
ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	
fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length	

**APHX specially for non-ferrous metals**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <b>Universal application</b> 			APHX 100304 FR-ALU				●			<b>HW 4415</b>	10 <b>281517 2003</b>	<b>15,80</b>
			APHX 160404 FR-ALU				●				<b>HW 4415</b>	10 281517 2203
<b>Polished design!</b>												

2129

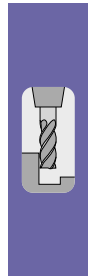
**ADKT**

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <b>Universal application</b> 			ADKT 1505 PDR	●	●					<b>PH 6920</b>	10 <b>285338 0142</b>	<b>11,10</b>

2170


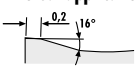
ISO	HW 4415
<b>ISO N</b> Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

ISO	PH 6920
<b>ISO P</b> steel	Vc = 90 - 160
<b>ISO M</b> stainless steel	Vc = 80 - 140
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 per cutting edge ap = max. 0.7 x cutting edge length



**palbit APKT / APHT ISO indexable milling inserts**

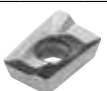
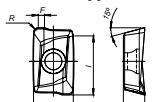
**APKT 10 PDS-R**

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <b>Universal application</b> 			APKT 1003-PDS-R	●	●	●				<b>PH 7930</b>	10 <b>281514 1051</b>	<b>10,95</b>
			<b>Universal insert</b>									

2170

ISO	PH 7930
<b>ISO P</b> steel	Vc = 120 - 180
<b>ISO M</b> stainless steel	Vc = 70 - 150
<b>ISO K</b> cast iron	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length

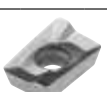
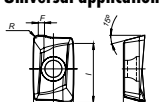
**APKT 10 PDER-X1**

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <b>Universal application</b> 			APKT 100305 PDER-X1	●		●				<b>PH 6920</b>	10 <b>285320 0242</b>	<b>8,40</b>
				○	○							<b>PH 6930</b>

2170

ISO	PH 6920	PH 6930
<b>ISO P</b> steel	Vc = 130 - 230	Vc = 120 - 180
<b>ISO M</b> stainless steel		Vc = 70 - 150
<b>ISO K</b> cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length	

**APKT 10 PDSR-X1**

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	<b>ISO designation</b>									
 <b>Universal application</b> 			APKT 100305 PDSR-X1	●		●				<b>PH 6920</b>	10 <b>285321 0342</b>	<b>8,40</b>
				○	○							<b>PH 6930</b>

2170

ISO	PH 6920	PH 6930
<b>ISO P</b> steel	Vc = 130 - 230	Vc = 120 - 180
<b>ISO K</b> cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	

Continued on next page >>>

**APKT 10 PDER-X**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	•	•	•	•	•	•	PH 6920	10 285322 0442	8,40
<p>Universal application</p>			APKT 100308 PDER-X							PH 6930	10 285322 0443	8,40
			•	•	•	•	•	•	•	•	PH 6920	10 285322 0442

2170

ISO	PH 6920	PH 6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO M stainless steel		Vc = 70 - 150
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length	

**APKT 10 PDSR-X**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	•	•	•	•	•	•	PH 6920	10 285323 0542	8,40
<p>Universal application</p>			APKT 100308 PDSR-X							PH 6920	10 285323 0542	8,40
			•	•	•	•	•	•	•	•	PH 6920	10 285323 0542

2170

ISO	PH 6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length

**APKT 10 PDTR-X**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	•	•	•	•	•	•	PH 6920	10 285324 0642	8,40
<p>Universal application</p>			APKT 100308 PDTR-X							PH 6920	10 285324 0642	8,40
			•	•	•	•	•	•	•	•	PH 6920	10 285324 0642

2170

ISO	PH 6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length

**APKT 1604-PDR**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	•	•	•	•	•	•	PH 7930	10 285440 0151	14,20
<p>Universal application</p>			APKT 1604 PDR							PH 7930	10 285440 0151	14,20
			<b>Universal insert</b>									

2170

ISO	PH 7930
ISO P steel	Vc = 120 - 180
ISO M stainless steel	Vc = 70 - 150
ISO K cast iron	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length




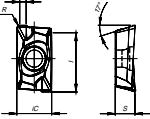
**APKT 1604-PDER-X1**

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation	•	•	•	•	•	•	PH 6920	10 285328 0142	11,10
<p>Universal application</p>			APKT 160408 PDER-X1							PH 6920	10 285328 0142	11,10
			•	•	•	•	•	•	•	•	PH 6920	10 285328 0142

2170




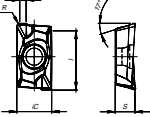
ISO	PH 6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length

1604-PDER-X2

F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
•	•	•		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
 Universal application 			APKT 160408 PDER-X2	•		•				PH 7920	10 285329 0250	11,10
				○	•	○				PH 7930	10 285329 0251	11,10




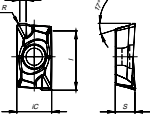
2170

APKT 1604-PDSR-X1

F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
•	•	•		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
 Universal application 			APKT 160408 PDSR-X1	•		•				PH 6920	10 285330 0342	11,10
				○		○				PH 6930	10 285330 0343	11,10




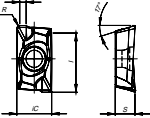
2170

APKT 1604-PDSR-X2

F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
•	•	•		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
 Universal application 			APKT 160408 PDSR-X2	•		•				PH 7920	10 285331 0450	11,10
				○		○				PH 7930	10 285331 0451	11,10

2170

APKT 1604-PDSR-X

F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
•	•	•		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
 Universal application 			APKT 160416 PDSR-X	•		•				PH 6920	10 285333 0642	11,10

2170

ISO	PH 7920	PH 7930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO M stainless steel		Vc = 70 - 150
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
$V_c = [m/min]$ $f_z = [mm/Z]$ $a_p = [mm]$		$f_z = 0.07 - 0.15$ per cutting edge $a_p = \max. 0.7 \times$ cutting edge length




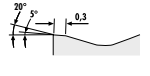
ISO	PH 6920	PH 6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
$V_c = [m/min]$ $f_z = [mm/Z]$ $a_p = [mm]$		$f_z = 0.10 - 0.25$ per cutting edge $a_p = \max. 0.7 \times$ cutting edge length

ISO	PH 7920	PH 7930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
$V_c = [m/min]$ $f_z = [mm/Z]$ $a_p = [mm]$		$f_z = 0.10 - 0.25$ per cutting edge $a_p = \max. 0.7 \times$ cutting edge length

ISO	PH 6920	
ISO P steel	Vc = 130 - 230	
ISO K cast iron	Vc = 80 - 280	
$V_c = [m/min]$ $f_z = [mm/Z]$ $a_p = [mm]$		$f_z = 0.10 - 0.25$ per cutting edge $a_p = \max. 0.7 \times$ cutting edge length

SCMT ISO milling inserts

SCMT


F finishing	M medium	R roughing	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
•	•	-		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
 Finishing/medium machining 			SCMT 060204	•						HC 4635	10 327410 1510	19,65

2129

ISO	HC 4635	
ISO P steel	Vc = 60 - 160	
$V_c = [m/min]$ $f_z = [mm/Z]$ $a_p = [mm]$		$f_z = 0.1 - 0.4$ $a_p = \max. 0.7 \times$ cutting edge length

## SEEN ISO milling inserts

### SEEN


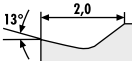
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
•	•	•	ISO designation										
 <b>Universal application</b>										HC 4620	10 284215 2905	11,40	
											SEEN 1203 AF-FN	HC 4540	10 284215 2907
										SEEN 1203 AF-SN			HC 4620
											SEEN 1203 AF-SN	HC 4620	
										SEEN 1203 AF-SN			HC 4540

2129

ISO	HC 4540	HC 4620	HW 4640
ISO P steel	Vc = 180 - 230	Vc = 120 - 210	Vc = 90 - 190
ISO M stainless steel	Vc = 105 - 135	Vc = 110 - 155	
ISO K cast iron	Vc = 170 - 215		
Vc = [m/min] fz = [mm/Z] ap = [mm]		fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

## SEET ISO milling inserts

### SEET


F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
•	•	•	ISO designation										
 <b>Universal application</b> 										HW 4410	10 284225 3001	9,60	
											SEET 1204 AFSN	HC 4620	10 284225 3005
										SEET 1204 AF-SN	HC 4540	10 284225 3007	11,50

2129

ISO	HC 4540	HC 4620	HW 4410
ISO P steel	Vc = 200 - 255	Vc = 205 - 280	
ISO M stainless steel	Vc = 120 - 150	Vc = 120 - 165	
ISO K cast iron	Vc = 190 - 240	Vc = 190 - 265	Vc = 125 - 145
ISO N Al/non-ferrous			Vc = 125 - 680
Vc = [m/min] fz = [mm/Z] ap = [mm]		fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

## SEKN ISO milling inserts

### SEKN


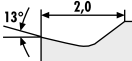
F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation									
 <b>Universal application</b>										PH 6920	10 285448 0142	8,95
											SEKN 1203 AFSN	

2170

ISO	PH 6920
ISO P steel	Vc = 120 - 250
ISO M stainless steel	Vc = 100 - 200
ISO K cast iron	Vc = 120 - 220
Vc = [m/min] fz = [mm/Z] ap = [mm]	
fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

## SEHT ISO milling inserts

### SEHT


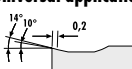
F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	ISO designation									
 <b>Universal application</b> 										PH 6740	10 285229 0139	10,55
											SEHT 1204 AFEN	

2170

ISO	PH 6740
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	
fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

## SEKR ISO milling inserts

## SEKR


F finishing	M medium	R roughing	<b>palbit</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	SEKR 1204 AFEN	●	●	●				PH 6135	10 285455 0133	8,95
 <p>Universal application</p> 												

2170

ISO	PH 6135
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 6.0

## SPKN ISO milling inserts

## SPKN


F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	SPKN 1203 EDSR	●	●	●				HC 4620	10 285720 5605	8,95
 <p>Universal application</p>												
				●	●	●				HC 4540	10 285720 5607	8,95

2129

ISO	HC 4540	HC 4620
ISO P steel	Vc = 200 - 270	Vc = 205 - 280
ISO M stainless steel	Vc = 120 - 160	Vc = 120 - 165
ISO K cast iron	Vc = 190 - 255	Vc = 190 - 265
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 6.0	

## ISO milling inserts SPMT / SPGT


## SPMT

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	○	○	SPMT 060304	●	○	○				HC 4635	10 263008 0006	11,40
 <p>Finishing/medium machining</p>												
				●	○	○				HC 4635	10 263008 0009	12,30
				●	○	○				HC 4635	10 263008 0012	13,55

2131

ISO	HC 4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.15 ap = 0.5 - 4.0

## SPGT ALU

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	○	SPGT 060304 ALU				●			HW 4415	10 263009 0006	13,45
 <p>Universal application</p>												
							●			HW 4415	10 263009 0009	14,45
							●			HW 4415	10 263009 0012	15,50


2131

ISO	HW 4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.20 ap = 0.5 - 2.0



## SPUN ISO milling inserts

### SPUN

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	SPUN 120308	●						HW 4640	10 286020 0203	5,95
 <p>Universal application</p>												


ISO	HW 4640
ISO P steel	Vc = 75 - 120
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 per cutting edge ap = max. 6.0

2129

## 4-10 Power/4-15 Power ISO milling inserts

- Cutting edges are marked with dots; please always use cutting edges with the same dots
- Quality grade HC 4535, ideal for stainless steel
- MM universal milling
- HW 4310 for aluminium, uncoated K10
- **PVD TiAlN/TiN**: coated carbide metal types


### LNM(E)X 10

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	LNM 100605 PNR-MM	●	●	●				HC 4630	10 295811 0001	15,40
 <p>Universal application</p>												
					●					HC 4535	10 295813 0001	15,40
							●			HW 4310	10 295815 0002	14,35

ISO	HC 4535	HC 4630	HW 4310
ISO P steel		Vc = 110 - 220	
ISO M stainless steel	Vc = 120 - 180	Vc = 90 - 160	
ISO K cast iron		Vc = 120 - 230	
ISO N Al/non-ferrous			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length		

2129

### LNM(E)X 15

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	•	LNM 151008 PNR-MM	●	●	●				HC 4630	10 295821 0001	18,95
 <p>Universal application</p>												
					●					HC 4535	10 295825 0001	18,95
							●			HW 4310	10 295826 0002	18,45

ISO	HC 4535	HC 4630	HW 4310
ISO P steel		Vc = 110 - 220	
ISO M stainless steel	Vc = 120 - 180	Vc = 90 - 160	
ISO K cast iron		Vc = 120 - 230	
ISO N Al/non-ferrous			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length		

2129



Ground sharp ...

... optimal chip control.

**ATORN®**  
Performance demands quality

## ATORN® Disc milling cutters





- Three cutting edges
- Fixed width
- Generates a slight roof shape at the base of the groove
- Screw-in indexable inserts
- For slotting, cutting and groove milling
- Supplied with clamping screws





Axial angle -3°, radial angle -12°



D mm	D1 mm	ap mm	A mm	B mm	Z	Z eff.	Cutting depth ae max. mm	suitable indexable inserts	suitable clamping screw	suitable TORX wrench			art.no.	€
63.0	22.0	4	8	34	8	4	14	SNHX 1102T	VTX 3503	TX 9	A1	B1	<b>262600 6304</b>	509,-
63.0	22.0	5	8	34	8	4	14	SNHX 1103T	VTX 3504	TX 9	A2	B1	262600 6305	509,-
63.0	22.0	6	8	34	6	3	14	SNHX 1203T	VTX 405	TX 15	A3	B2	262600 6306	509,-
80.0	22.0	4	8	34	10	5	22	SNHX 1102T	VTX 3503	TX 9	A1	B1	262600 8004	599,-
80.0	22.0	5	8	34	10	5	22	SNHX 1103T	VTX 3504	TX 9	A2	B1	262600 8005	599,-
80.0	22.0	6	8	34	8	4	22	SNHX 1203T	VTX 405	TX 15	A3	B2	262600 8006	599,-
100.0	27.0	4	12	45	12	6	25	SNHX 1102T	VTX 3503	TX 9	A1	B1	262600 1004	729,-
100.0	27.0	5	12	45	12	6	25	SNHX 1103T	VTX 3504	TX 9	A2	B1	262600 1005	729,-
100.0	27.0	6	12	45	10	5	25	SNHX 1203T	VTX 405	TX 15	A3	B2	262600 1006	729,-
100.0	27.0	10	12	45	10	5	25	SNHX 1205T	VTX 408	TX 15	A4	B2	262600 1010	769,-
125.0	40.0	4	12	58	12	6	31	SNHX 1102T	VTX 3503	TX 9	A1	B1	262600 1204	849,-
125.0	40.0	5	12	58	12	6	31	SNHX 1103T	VTX 3504	TX 9	A2	B1	262600 1205	849,-
125.0	40.0	6	12	58	12	6	31	SNHX 1203T	VTX 405	TX 15	A3	B2	262600 1206	849,-
125.0	40.0	10	12	58	12	6	31	SNHX 1205T	VTX 408	TX 15	A4	B2	262600 1210	889,-
160.0	40.0	4	12	68	18	9	44	SNHX 1102T	VTX 3503	TX 9	A1	B1	262600 1604	999,-
160.0	40.0	5	12	68	18	9	44	SNHX 1103T	VTX 3504	TX 9	A2	B1	262600 1605	999,-
160.0	40.0	6	12	68	16	8	44	SNHX 1203T	VTX 405	TX 15	A3	B2	262600 1606	999,-
160.0	40.0	10	12	68	16	8	44	SNHX 1205T	VTX 408	TX 15	A4	B2	262600 1610	1.049,-
160.0	40.0	14	14	68	15	5	44	SNHX 1205T	VTX 408	TX 15	A4	B2	262600 1614	1.069,-
200.0	50.0	4	12	72	18	9	62	SNHX 1102T	VTX 3503	TX 9	A1	B1	262600 2004	1.369,-
200.0	50.0	5	12	72	18	9	62	SNHX 1103T	VTX 3504	TX 9	A2	B1	262600 2005	1.369,-
200.0	50.0	6	12	72	18	9	62	SNHX 1203T	VTX 405	TX 15	A3	B2	262600 2006	1.369,-
200.0	50.0	10	12	72	18	9	62	SNHX 1205T	VTX 408	TX 15	A4	B2	262600 2010	1.389,-
200.0	50.0	14	14	72	18	6	62	SNHX 1205T	VTX 408	TX 15	A4	B2	262600 2014	1.389,-
250.0	50.0	10	12	72	24	12	87	SNHX 1205T	VTX 408	TX 15	A4	B2	262600 2510	1.639,-

2125

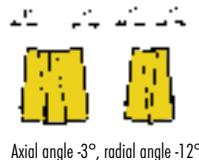
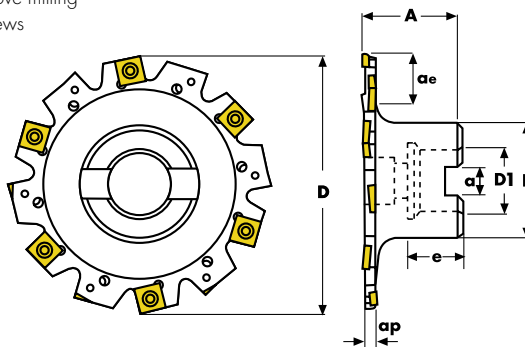
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
	A1 285799 3530	8,-		B1 703053 0090	1,93
	A2 285799 3540	8,-		B2 703053 0150	1,93
	A3 285799 4050	8,-			
	A4 285799 4080	8,-			
	3106			7114	

## ATORN® Disc milling cutter with collar



- Three cutting edges
- Fixed width
- Generates a slight roof shape at the base of the groove
- Screw-in indexable inserts
- For slotting, cutting and groove milling
- Supplied with clamping screws



D mm	D1 mm	ap mm	A mm	B mm	Z	Z eff.	Cutting depth mm	ae max. mm	a mm	e mm	suitable indexable inserts	suitable clamping screw	suitable TORX wrench	art.no.	€
50	16	4	50	32	4	2	8.5	8.5	18.5		SNHX 1102T	VTX3503	TX09	A1 B1	262610 5004 599,-
50	16	5	50	32	4	2	8.5	8.5	18.5		SNHX 1103T	VTX3504	TX09	A1 B1	262610 5005 599,-
50	16	6	50	32	4	2	8.5	8.5	18.5		SNHX 1203T	VTX405	TX15	A1 B1	262610 5006 599,-
50	16	10	50	32	4	2	8.5	8.5	18.5		SNHX 1205T	VTX408	TX15	A1 B1	262610 5010 609,-
63.0	22	4	50	40	8	4	10.5	10.4	21		SNHX 1102T	VTX 3503	TX 9	A1 B1	262610 6304 579,-
63.0	22	5	50	40	8	4	10.5	10.4	21		SNHX 1103T	VTX 3504	TX 9	A2 B1	262610 6305 579,-
63.0	22	6	50	40	6	3	10.5	10.4	21		SNHX 1203T	VTX 405	TX 15	A3 B2	262610 6306 569,-
80.0	22	4	50	40	10	5	20.0	10.4	21		SNHX 1102T	VTX 3503	TX 9	A1 B1	262610 8004 689,-
80.0	22	5	50	40	10	5	20.0	10.4	21		SNHX 1103T	VTX 3504	TX 9	A2 B1	262610 8005 689,-
80.0	22	6	50	40	8	4	20.0	10.4	21		SNHX 1203T	VTX 405	TX 15	A3 B2	262610 8006 689,-
100.0	27	4	50	48	12	6	24.2	12.4	23		SNHX 1102T	VTX 3503	TX 9	A1 B1	262610 1004 839,-
100.0	27	5	50	48	12	6	24.2	12.4	23		SNHX 1103T	VTX 3504	TX 9	A2 B1	262610 1005 849,-
100.0	27	6	50	48	10	5	24.2	12.4	23		SNHX 1203T	VTX 405	TX 15	A3 B2	262610 1006 849,-
100.0	27	10	50	48	10	5	24.2	12.4	23		SNHX 1205T	VTX 408	TX 15	A4 B2	262610 1010 849,-
125.0	40	6	50	70	12	6	23.7	16.4	30		SNHX 1203T	VTX 405	TX 15	A3 B2	262610 1206 929,-
125.0	40	10	50	70	12	6	23.7	16.4	30		SNHX 1205T	VTX 408	TX 15	A4 B2	262610 1210 929,-
160.0	40	6	50	70	16	8	41.2	16.4	30		SNHX 1203T	VTX 405	TX 15	A3 B2	262610 1606 1.069,-
160.0	40	10	50	70	16	8	41.2	16.4	30		SNHX 1205T	VTX 408	TX 15	A4 B2	262610 1610 1.069,-

2125

### Spare parts

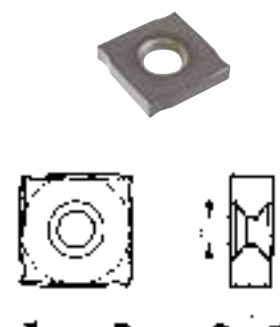
Screw			TORX		
art.no.	€		art.no.	€	
A1 285799 3530	8,-		B1 703053 0090	1,93	
A2 285799 3540	8,-		B2 703053 0150	1,93	
A3 285799 4050	8,-				
A4 285799 4080	8,-				
3106			7114		

## ATORN® SNHX milling inserts

Type	l mm	s mm	d mm	ISO $\square$ M $\square$ K		ISO $\square$ N $\square$ K	
				HC4630 TiAlN	HW4415 uncoated		
				art.no.	€	art.no.	€
SNHX 1102T	11.0	2.3	4.4	10	285705 0107 17,95	10	285707 0107 19,85
SNHX 1103T	11.0	2.7	4.4	10	285705 0207 18,15	10	285707 0207 19,95
SNHX 1203T	12.7	3.2	5.0	10	285705 0307 18,25	10	285707 0307 20,10
SNHX 1205T	12.7	5.4	5.0	10	285705 0507 21,10	10	285707 0507 23,20

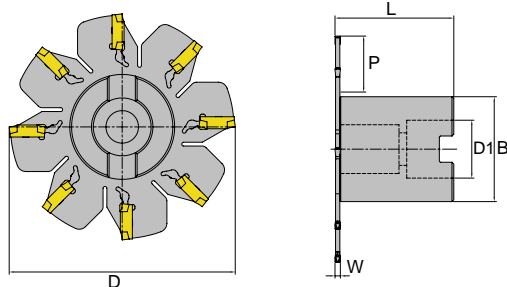
2129

2129



## SARA® Disc milling cutters with long inserts

- Slot disc milling cutter with indexable inserts
- **for slot and burr cutting**
- single-sided and double-sided recessing inserts
- **Supplied with: without assembly key and recessing inserts**



D mm	L mm	W mm	P mm	B mm	D1 mm	Z mm	suitable cutting inserts	art.no.	€
80	39.9	2.0	25	29	M16	4	GELCG.. 1920002	A1	<b>262630 2080</b> 709,-
100	51.9	2.0	28	40	22	6	GELCG.. 1920002	A1	262630 2100 819,-
125	51.9	2.0	36	48	27	8	GELCG.. 1920002	A1	262630 2125 879,-
160	64.9	2.0	39	80	40	10	GELCG.. 1920002	A1	262630 2160 1.049,-
80	40.7	3.0	25	29	M16	4	GELCG.. 1920002	A1	262630 3080 719,-
100	52.7	3.0	28	40	22	6	GELCG.. 1930002	A1	262630 3100 829,-
125	52.7	3.0	36	48	27	8	GELCG.. 1930002	A1	262630 3125 899,-
160	65.7	3.0	39	80	40	10	GELCG.. 1930002	A1	262630 3160 1.059,-
125	53.5	4.0	37.5	48	27	6	GELCG.. 1940002	A1	262630 4125 869,-
160	66.5	4.0	39	80	40	8	GELCG.. 1940002	A1	262630 4160 979,-

2177

### Spare parts

Chuck key	
art.no.	€
A1 262631 9901	9,10

2177

## SARA® Cutting insert GELCG...

### Cutting insert, one-sided

ISO designation	Width mm	r mm	ISO						Quality	art.no.	€
			ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
GELCGS 192002	2	0.2				●			<b>SWN 15 G</b>	10 285711 2015	10,20
	2	0.2	●		●				<b>SCU 30 G</b>	10 285711 2030	10,20
	2	0.2		●					<b>SCM 30 G</b>	10 285711 2035	10,20
GELCGS 193002	3	0.2				●			<b>SWN 15 G</b>	10 285711 3015	10,70
	3	0.2	●		●				<b>SCU 30 G</b>	10 285711 3030	10,70
	3	0.2		●					<b>SCM 30 G</b>	10 285711 3035	10,70
GELCGS 234002	4	0.2				●			<b>SWN 15 G</b>	10 285711 4015	11,50
	4	0.2	●		●				<b>SCU 30 G</b>	10 285711 4030	11,50
	4	0.2		●					<b>SCM 30 G</b>	10 285711 4035	11,50

2177

ISO	SCM 30 G	SCU 30 G	SWN 15 G
<b>ISO P</b> steel		Vc = 120 - 220	
<b>ISO M</b> stainless steel	Vc = 130 - 150		
<b>ISO K</b> cast iron		Vc = 180 - 200	
<b>ISO N</b> Al/non-ferrous			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z]	fz = 0.04 - 0.18	fz = 0.04 - 0.26	

### Cutting insert, double-sided

ISO designation	Width mm	r mm	ISO						Quality	art.no.	€
			ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
GELCGD 192002	2	0.2				●			<b>SWN 15 G</b>	10 285712 2015	12,05
	2	0.2	●		●				<b>SCU 30 G</b>	10 285712 2030	12,05
	2	0.2		●					<b>SCM 30 G</b>	10 285712 2035	12,05
GELCGD 193002	3	0.2				●			<b>SWN 15 G</b>	10 285712 3015	12,85
	3	0.2	●		●				<b>SCU 30 G</b>	10 285712 3030	12,85
	3	0.2		●					<b>SCM 30 G</b>	10 285712 3035	12,85
GELCGD 234002	4	0.2				●			<b>SWN 15 G</b>	10 285712 4015	13,35
	4	0.2	●		●				<b>SCU 30 G</b>	10 285712 4030	13,35
	4	0.2		●					<b>SCM 30 G</b>	10 285712 4035	13,35

2177

ISO	SCM 30 G	SCU 30 G	SWN 15 G
<b>ISO P</b> steel		Vc = 120 - 220	
<b>ISO M</b> stainless steel	Vc = 130 - 150		
<b>ISO K</b> cast iron		Vc = 180 - 200	
<b>ISO N</b> Al/non-ferrous			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z]	fz = 0.04 - 0.18		fz = 0.04 - 0.26

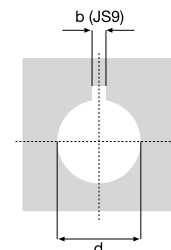
## Push broaches (keyway broaches)

- For manufacturing true-to-size and precisely centred keyways in accordance with DIN 6885
- Can be used on normal workshop presses (hand press or hydraulic press); no special machinery required
- Low tooling time
- Good surface finish on machined workpieces
- Manufacturing time for one keyway only approx. 1 minute
- Broaches supplied with inserts for achieving the cutting depth
- Special alloy HSS steel for machining any materials with a hardness of up to 34 HRC
- Broaches with other rake angles are available on request for machining solid or very soft materials.
- Square and multi-purpose four square broaches are available on request.

### From size 32 x 102, guide bush without collar

#### Use:

1. Slide guide bush into workpiece bore and insert broach until the first tooth on the workpiece is standing upright
2. Lubricate broach
3. Push broach in approx. 1/3
4. Briefly release plunger and push broach in fully
5. Clean broach and fit insert for the second pass
6. Repeat broaching operation



#### Broaches

Groove in workpiece b (JS9) x depth mm	Broach length mm	Broaching length min./max. mm	Number of faces	art.no.	€
2 x 1.0	133	6 - 30	1	<b>234001 0020</b>	<b>138,50</b>
3 x 1.4	133	6 - 30	2	234001 0030	138,50
4 x 1.8	178	8 - 43	2	234001 0040	162,-
5 x 2.3	178	8 - 43	2	234001 0050	162,-
6 x 2.8	302	10 - 64	2	234001 0060	196,50
8 x 3.3	302	10 - 64	2	234001 0080	196,50
10 x 3.3	352	20 - 150	3	234001 0100	285,-
12 x 3.3	352	20 - 150	3	234001 0120	285,-
14 x 3.8	352	20 - 150	3	234001 0140	285,-
16 x 4.3	387	20 - 150	4	234001 0160	495,-
18 x 4.4	387	20 - 150	4	234001 0180	495,-

2114



#### Guide bushes

d h9 mm	L mm	Guide bushes for broaches mm	art.no.	€
6	32	2-3	<b>234005 0632</b>	<b>29,30</b>
7	32	2-3	234005 0732	29,30
8	32	2-3	234005 0832	29,30
9	32	2-3	234005 0932	29,30
10	32	2-3	234005 1032	29,30
11	46	4-5	234005 1146	31,80
12	46	4-5	234005 1246	31,80
14	46	4-5	234005 1446	31,80
15	46	4-5	234005 1546	31,80
16	46	4-5	234005 1646	31,80
17	46	4-5	234005 1746	31,80
17	65	6-8	234005 1765	34,90
18	65	6-8	234005 1865	34,90
19	65	6-8	234005 1965	34,90
20	65	6-8	234005 2065	34,90
22	65	6-8	234005 2265	34,90
24	65	6-8	234005 2465	34,90
25	65	6-8	234005 2565	34,90
26	65	6-8	234005 2665	34,90

2114

d h9 mm	L mm	Guide bushes for broaches mm	art.no.	€
28	65	6-8	234005 2865	41,80
30	65	6-8	234005 3065	41,80
32	102	10-14	234005 3210	54,50
34	102	10-14	234005 3410	54,50
35	102	10-14	234005 3510	54,50
36	102	10-14	234005 3610	54,50
38	102	10-14	234005 3810	54,50
40	102	10-14	234005 4010	64,60
42	102	10-14	234005 4210	64,60
44	102	10-14	234005 4410	64,60
45	127	10-14	234005 4512	64,60
46	127	10-14	234005 4612	64,60
48	127	10-14	234005 4812	64,60
50	127	10-14	234005 5012	64,60
52	127	16-18	234005 5212	144,50
54	127	16-18	234005 5412	144,50
55	127	16-18	234005 5512	144,50
56	127	16-18	234005 5612	144,50
58	127	16-18	234005 5812	146,50

2114

d h9 mm	L mm	Guide bushes for broaches mm	art.no.	€
60	154	16-18	234005 6015	146,50
62	154	16-18	234005 6215	146,50
64	154	16-18	234005 6415	146,50
65	154	16-18	234005 6515	156,-
66	154	16-18	234005 6615	156,-
68	154	16-18	234005 6815	156,-
70	154	16-18	234005 7015	163,-

2114

#### Sets

Contents	art.no.	€
1 broach for each keyway width, 2/3/4/5/6/8 mm, incl. inserts. 1 guide bush in each size, 8/10/12/14/15/16/18/20/22/24/25/28/30	<b>234010 0208</b>	<b>1.529,-</b>
1 broach for each keyway width, 4/5/6/8 mm, incl. inserts. 1 guide bush in each size, 12/14/15/16/18/20/22/24/25	234010 0408	989,-

2114





# MILLING TOOLS

# TECHNICAL

CUTTING DATA

USAGE RECOMMENDATIONS

MACHINING NOTES

TYPE DESCRIPTIONS

SYSTEMS OVERVIEWS

PROGRAMMING NOTES



# ISO designation system for indexable cutting inserts according to ISO 1832

## Example of indexable milling inserts



### 1 Insert form

<b>A</b>	<b>M</b>
<b>B</b>	<b>O</b>
<b>C</b>	<b>P</b>
<b>D</b>	<b>R</b>
<b>E</b>	<b>S</b>
<b>H</b>	<b>T</b>
<b>K</b>	<b>V</b>
<b>L</b>	<b>W</b>

### 2 Clearance angle

<b>A</b>	<b>F</b>
<b>B</b>	<b>G</b>
<b>C</b>	<b>N</b>
<b>D</b>	<b>P</b>
<b>E</b>	<b>O</b> Other clearance angle

### 3 Tolerances

	d	m	s
A	± 0.025	± 0.005	± 0.025
C	± 0.025	± 0.013	± 0.025
E	± 0.025	± 0.025	± 0.025
F	± 0.013	± 0.005	± 0.025
G	± 0.025	± 0.025	± 0.05-0.13
H	± 0.013	± 0.013	± 0.025
J <sup>1)</sup>	± 0.05-0.15 <sup>2)</sup>	± 0.005	± 0.025
K <sup>1)</sup>	± 0.05-0.15 <sup>2)</sup>	± 0.013	± 0.025
L <sup>1)</sup>	± 0.05-0.15 <sup>2)</sup>	± 0.013	± 0.025 <sup>1)</sup>
M	± 0.05-0.15 <sup>2)</sup>	± 0.08-0.20 <sup>2)</sup>	± 0.013
M	± 0.05-0.15 <sup>2)</sup>	± 0.08-0.20 <sup>2)</sup>	± 0.025
N	± 0.05-0.25 <sup>2)</sup>	± 0.13-0.38 <sup>2)</sup>	± 0.05-0.13

<sup>1)</sup> Inserts with ground face-edge cutters  
<sup>2)</sup> Each according to insert size (see ISO standard 1832)  
 The tolerances m and d are not dependent on the insert form.

### 6 Insert thickness

	s (mm)
01	1.59
T1	1.98
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

### 7 Corner rounding

	r (mm)
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
24	2.4

**R** for diameter in inches converted into mm  
**M0** for diameter in metric dimensions

Tool cutting edge angle	Clearance angle on the face plate
A	45°
D	60°
E	75°
F	85°
P	90°
Z	Other

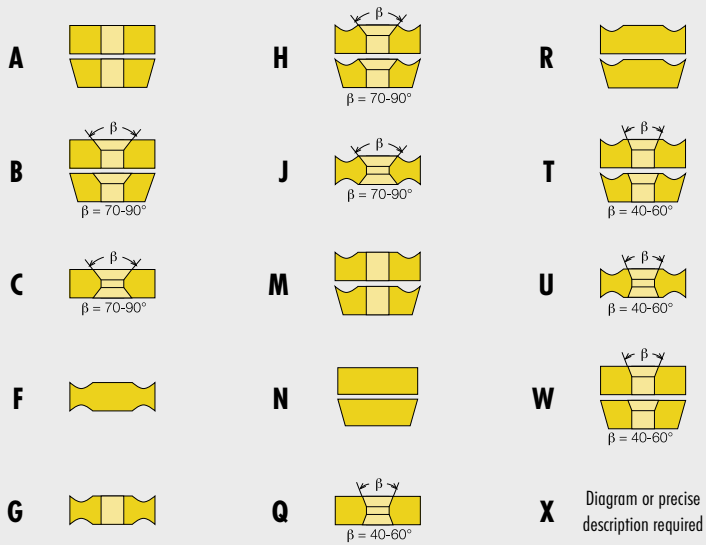
### 8 Cutting edge formation

<b>E</b> rounded	
<b>F</b> sharp-edged	
<b>T</b> chamfered	
<b>S</b> chamfered and rounded	

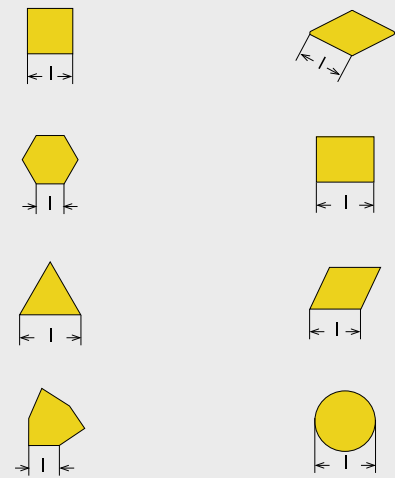
### 9 Cutting direction



## 4 Cutting and fixing qualities



## 5 Cutting edge length



## 10 Manufacturer information

The ISO code comprises 9 symbols, whereby symbols 8 and/or 9 are used only where necessary. The manufacturer can affix further symbols to the ISO code with a hyphen e.g. to indicate the chip breaker form).



### ATORN® Cutting material table Carbide qualities, coated



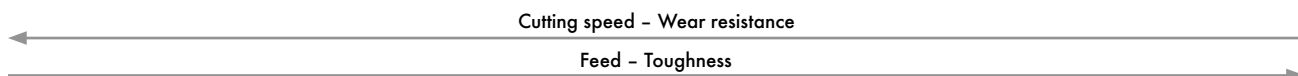
	ISO P					ISO M					ISO K					ISO N					ISO S					ISO H																												
	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45
<b>Recess milling</b>																																																						
HC3635	[Shaded]										[Shaded]										[Shaded]																																	
<b>Milling</b>																																																						
HC4535	[Shaded]										[Shaded]										[Shaded]																																	
HC4635	[Shaded]										[Shaded]										[Shaded]																																	
HC4535	[Shaded]										[Shaded]										[Shaded]																																	
HC4540	[Shaded]										[Shaded]										[Shaded]																																	
HC4615	[Shaded]										[Shaded]										[Shaded]																																	
HC4620	[Shaded]										[Shaded]										[Shaded]																																	
HC4630	[Shaded]										[Shaded]										[Shaded]																																	
HC4635	[Shaded]										[Shaded]										[Shaded]																																	
HC4636	[Shaded]										[Shaded]										[Shaded]																																	
HC7630	[Shaded]										[Shaded]										[Shaded]																																	
<b>Thread milling</b>																																																						
AMT7	[Shaded]										[Shaded]										[Shaded]																																	
AMT8	[Shaded]										[Shaded]										[Shaded]																																	
AMT9	[Shaded]										[Shaded]										[Shaded]																																	

### ATORN® Cutting material table Carbide qualities, uncoated



	ISO P					ISO M					ISO K					ISO N					ISO S					ISO H																												
	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45
<b>Recess milling</b>																																																						
HW3410	[Shaded]										[Shaded]										[Shaded]																																	
<b>Milling</b>																																																						
HW4640	[Shaded]										[Shaded]										[Shaded]																																	
HW4410	[Shaded]										[Shaded]										[Shaded]																																	
HW4415	[Shaded]										[Shaded]										[Shaded]																																	

### ATORN® Cutting material table CBN / PKD



	ISO P					ISO M					ISO K					ISO N					ISO S					ISO H																												
	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45
<b>Milling</b>																																																						
ABC10	[Shaded]										[Shaded]										[Shaded]																																	
ABC25	[Shaded]										[Shaded]										[Shaded]																																	

### Cutting material table Carbide qualities



	ISO P					ISO M					ISO K					ISO N					ISO S					ISO H																												
	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45	50	1	5	10	15	20	25	30	35	40	45
DH 103	[Shaded]										[Shaded]										[Shaded]																																	
JC 605W	[Shaded]										[Shaded]										[Shaded]																																	
JC 5040	[Shaded]										[Shaded]										[Shaded]																																	
JC 8015	[Shaded]										[Shaded]										[Shaded]																																	
JC 8050	[Shaded]										[Shaded]										[Shaded]																																	
JC 5118	[Shaded]										[Shaded]										[Shaded]																																	



## Designations and formulae (milling)

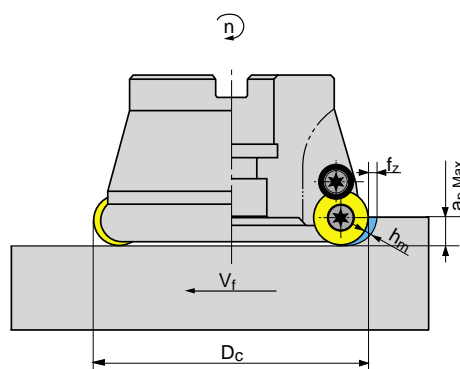
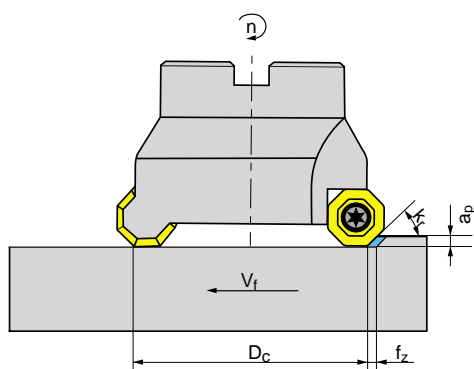
INFO

<b>D<sub>c</sub></b>	Cutting diameter	mm
<b>a<sub>e</sub></b>	Radial cutting width	mm
<b>a<sub>p</sub></b>	Axial cutting depth	mm
<b>f</b>	Feed per revolution	mm/rev
<b>f<sub>z</sub></b>	Feed per tooth	mm/rev
<b>D<sub>e</sub></b>	Effective cutting diameter	mm
<b>V<sub>c</sub></b>	Cutting speed	m/min.
<b>Q</b>	Material removal rate	cm <sup>3</sup> /min.
<b>l</b>	Working length	mm
<b>V<sub>f</sub></b>	Feed rate	m/min.
<b>D<sub>ap</sub></b>	Max. cutting diameter for specified cutting depth	mm
<b>z<sub>n</sub></b>	Number of cutting corners in the tool	

<b>z<sub>c</sub></b>	Effective number of cutting edges	
<b>hex</b>	Maximum chip thickness	mm
<b>h<sub>m</sub></b>	Average chip thickness	mm
<b>k<sub>c1</sub></b>	Specific cutting force (hex = 1 mm)	N/mm <sup>2</sup>
<b>P<sub>a</sub></b>	Drive power	kW
<b>kr</b>	Tool cutting edge angle	° (degree)
<b>V<sub>co</sub></b>	Cutting speed (constant)	
<b>C<sub>vc</sub></b>	Cutting speed correction factor	
<b>n</b>	Rotational speed	rpm
<b>η<sub>mt</sub></b>	Efficiency	%
<b>mc</b>	Increasing the specific cutting force through the chip thickness	

<b>Cutting speed</b>	$V_c = \frac{\pi \times D_c \times n}{1000} = \text{m/min.}$
<b>Feed</b>	$V_f = f_z \times n \times z_n = \text{mm/min.}$
<b>Feed per revolution</b>	$f_n = \frac{V_f}{n} = \text{mm/U}$
<b>Specif. cutting force</b>	$k_c = k_{c1} \times h_{nm}^{-mc} = \text{N/mm}^2$
<b>Average chip thickness</b> (face and shoulder milling) $a_e / D_c \leq 0.1$	$h_m = f_z \sqrt{\frac{a_e}{D_c}} = \text{mm}$
<b>Average chip thickness</b> $a_e / D_c \geq 0.1$	$h_m = \frac{\sin k_r \times 180 \times a_e \times f_z}{\pi \times D_c \times \arcsin\left(\frac{a_e}{D_c}\right)} = \text{mm}$

<b>Rotational speed</b>	$n = \frac{V_c \times 1000}{\pi \times D_c} = \text{U/min.}$
<b>Feed per tooth</b>	$f_z = \frac{V_f}{n \times z_n} = \text{mm/U}$
<b>Material removal rate</b>	$Q = \frac{a_p \times a_e \times V_f}{1000} = \text{cm}^3/\text{min.}$
<b>Effective cutting edge diameter</b>	$D_e = 2 \times \sqrt{a_p \times (D_c - a_p)} = \text{mm}$
<b>Drive power</b>	$P_a = \frac{a_p \times a_e \times V_f \times k_c}{60 \times 10^6 \times \eta_{mt}} = \text{kW}$
<b>Machining time</b>	$T_c = \frac{l}{V_f} = \text{min.}$



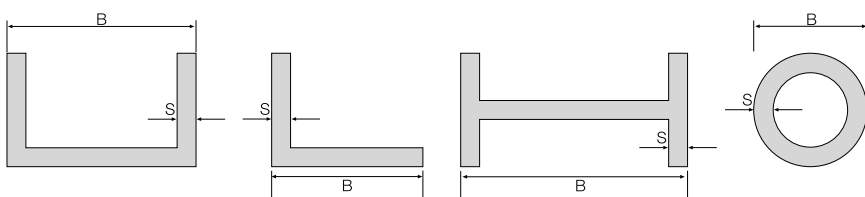
## Recommendations for toothing and tooth shapes

INFO

### Sawing solid material

Standard toothing		Combination toothing	
Material cross-section	Tooth pitch with tooth shape	Material cross-section	Tooth pitch with tooth shape
<b>&lt; 12 mm</b>	<b>14 TPI.N</b>	<b>&lt; 25 mm</b>	<b>10/14 standard</b>
<b>12 - 30 mm</b>	<b>10 TPI.N</b>	<b>20 - 40 mm</b>	<b>8/12 standard</b>
<b>30 - 50 mm</b>	<b>8 TPI.N</b>	<b>25 - 70 mm</b>	<b>6/10 standard</b>
<b>50 - 80 mm</b>	<b>6 TPI.N</b>	<b>35 - 90 mm</b>	<b>5/8 ZpZ. standard</b>
80 - 100 mm	4 TPI.small	50 - 100 mm	4/6 TPI.plus
110 - 200 mm	3 TPI.small	80 - 150 mm	3/4 TPI.plus
200 - 350 mm	2 TPI.small	120 - 350 mm	2/3 TPI.plus
300 - 700 mm	1,25 small	300 - 500 mm	1,33/2 TPI.plus
> 700 mm	0,75 small	> 500 mm	0,75 - 1,25 TPI.plus

in bold = catalogue version



### Correct toothing

Selecting the correct tooth pitch is essential to achieve the best possible cutting results:

- The tooth pitch is calculated from the working length of the saw band.
- Selecting too low a pitch can cause deviations in cutting, as chips may block the cutting teeth and force the saw band off its cutting line.
- Selecting too high a pitch can cause teeth to become bent, as the cutting pressure on individual teeth is too large.
- At least three teeth should be engaged to achieve cost-effective results.



### Sawing pipes and profile sections

Wall thickness S mm	Teeth per inch											
	diam. B											
	20	40	60	80	100	120	150	200	300	500	750	1000
2	32	24	18	18	<b>14</b>	<b>14</b>	<b>10/14</b>	<b>10/14</b>	<b>8/12</b>	<b>6/10</b>	<b>5/8</b>	<b>5/8</b>
3	24	18	<b>14</b>	<b>14</b>	<b>10/14</b>	<b>10/14</b>	<b>8/12</b>	<b>8/12</b>	<b>6/10</b>	<b>5/8</b>	<b>4/6 0°</b>	<b>4/6 0°</b>
4	<b>18</b>	<b>10/14</b>	<b>10/14</b>	<b>10/14</b>	<b>8/12</b>	<b>8/12</b>	<b>6/10</b>	<b>6/10</b>	<b>5/8</b>	<b>4/6 0°</b>	<b>4/6 0°</b>	<b>4/6 0°</b>
5	<b>18</b>	<b>10/14</b>	<b>10/14</b>	<b>8/12</b>	<b>6/10</b>	<b>6/10</b>	<b>6/10</b>	<b>5/8</b>	<b>4/6 0°</b>	<b>4/6 0°</b>	<b>4/6 0°</b>	<b>3/4 0°</b>
6	<b>14</b>	<b>8/12</b>	<b>8/12</b>	<b>8/12</b>	<b>6/10</b>	<b>6/10</b>	<b>5/8</b>	<b>5/8</b>	<b>4/6 0°</b>	<b>4/6 0°</b>	<b>3/4 0°</b>	<b>3/4 0°</b>
8		<b>6/10</b>	<b>6/10</b>	<b>6/10</b>	<b>5/8</b>	<b>5/8</b>	<b>5/8</b>	<b>4/6 0°</b>	<b>4/6 0°</b>	<b>3/4 0°</b>	<b>3/4 0°</b>	<b>3/4 0°</b>
10		<b>6/10</b>	<b>6/10</b>	<b>5/8</b>	<b>5/8</b>	<b>5/8</b>	<b>4/6 0°</b>	<b>4/6 0°</b>	<b>4/6 0°</b>	<b>3/4 0°</b>	<b>3/4 0°</b>	<b>3/4 0°</b>
12		<b>5/8</b>	<b>5/8</b>	<b>5/8</b>	4/6 pos	4/6 pos	4/6 pos	4/6 pos	3/4 pos	3/4 pos	2/3 pos	2/3 pos
15			<b>5/8</b>	4/6 pos	4/6 pos	4/6 pos	4/6 pos	3/4 pos	3/4 pos	2/3 pos	2/3 pos	2/3 pos
20			4/6 pos	4/6 pos	4/6 pos	3/4 pos	3/4 pos	3/4 pos	2/3 pos	2/3 pos	2/3 pos	2/3 pos
30			3/4 pos	3/4 pos	3/4 pos	3/4 pos	2/3 pos	2/3 pos	2/3 pos	2/3 pos	1,33/2 pos	1,33/2 pos
50						3/4 pos	2/3 pos	2/3 pos	2/3 pos	1,33/2 pos	1,33/2 pos	1,33/2 pos
75								2/3 pos	1,33/2 pos	1,33/2 pos	1,33/2 pos	0,75/1,25 pos
100									1,33/2 pos	0,75/1,25 pos	0,75/1,25 pos	0,75/1,25 pos
150										0,75/1,25 pos	0,75/1,25 pos	0,75/1,25 pos
200										0,75/1,25 pos	0,75/1,25 pos	0,75/1,25 pos

in bold = catalogue version

If two or more pipes need to be cut alongside one another, take into consideration the doubled wall thickness when using the table.

Critical factors in choosing the correct tooth pitch:

- Sawing pipes and profile sections in layers and bundles
- Sawing pipes and profile sections individually

## Summary of icons used for metal saws

INFO

Pipes	 
Supports	 
Bundles	  
Solid material	

# SARA® Metal circular saw blade

200101.... 200105....  
200110....

Vc = Cutting speed (m/min)  
n = Rotational speed (rpm), mean value  
f = The feed per revolution must be calculated depending on the material cross-section and stability, saw blade toothing, as well as the mechanical circumstances.

ISO	Cutting speed Vc m/min	Rotational speed min. - max. rpm										Coolant / lubricant	
		Ø 32 mm	Ø 40 mm	Ø 50 mm	Ø 63 mm	Ø 80 mm	Ø 100 mm	Ø 125 mm	Ø 160 mm	Ø 200 mm	Ø 250 mm		
P	Steel up to 500 N/mm <sup>2</sup>	25 - 50	250 - 500	200-400	160 - 320	125 - 250	100 - 200	80-100	63 - 130	50 - 100	40 - 80	31 - 62	High-performance cooling lubricant concentrate with water 1:20
	Steel up to 800 N/mm <sup>2</sup>	15 - 30	120 - 300	120 - 240	95 - 190	75 - 150	60 - 120	47 - 95	38 - 76	30 - 60	24 - 47	19 - 38	
	Steel up to 1100 N/mm <sup>2</sup>	10 - 20	100 - 200	79 - 160	63 - 125	50 - 100	40 - 80	31 - 63	25 - 50	20 - 40	16 - 32	12.7 - 25	
M	Stainless steel (V2A, V4A)	7 - 15	75 - 150	55 - 120	45 - 95	35 - 75	28 - 60	22 - 47	18 - 38	14 - 30	11 - 24	9 - 19	High-performance cooling lubricant concentrate with water 1:12
K	Grey cast iron up to GG18	25 - 45	250 - 450	200 - 350	160 - 290	125 - 225	100 - 180	80 - 145	63 - 115	50 - 90	40 - 70	31 - 57	Dry or compressed air
	Grey cast iron above GG18	25 - 30	250 - 300	200 - 240	160 - 190	125 - 150	100 - 120	80 - 95	63 - 76	50 - 60	40 - 47	31 - 38	Dry or compressed air
S	Bronze, Cu alloys	120 - 200	1,200 - 2,000	955 - 1,600	760 - 1,300	610 - 1,000	480 - 800	380 - 630	300 - 500	240 - 400	190 - 320	152 - 250	High-performance cooling lubricant concentrate with water 1:30
	Copper, brass, aluminium	400 - 1,000	4,000 - 10,000	3,200 - 8,000	2,500 - 6,300	2,000 - 5,050	1,600 - 4,000	1,300 - 3,200	1,000 - 2,500	800 - 2,000	650 - 1,600	510 - 1,270	High-performance cooling lubricant concentrate with water 1:50
	Lightweight metal profiles*	1,000 - 2,400	10,000 - 24,000	8,000 - 19,100	6,300 - 15,300	5,050 - 12,120	4,000 - 9,560	3,200 - 7,650	2,500 - 6,120	2,000 - 4,780	1,600 - 3,820	1,270 - 3,050	Lubrication pin
	Plastics*	1,500 - 2,400	15,000 - 24,000	12,000 - 19,100	9,500 - 15,300	7,500 - 12,120	6,000 - 9,560	5,000 - 7,650	3,800 - 4,780	3,000 - 4,780	2,400 - 3,820	1,900 - 3,050	Dry

\* = for high cutting speeds (from 1000 m/min) always use extra-tough saw blades!  
When ordering, please indicate: machine speed or cutting speed and material to be cut.

All blades are laterally bevel-ground (hollow grinding).  
All sizes from Ø 200 mm and very slim blades have a borehole collar for extra stability.  
Accuracy, tooth form and lateral bevel grinding correspond to DIN 1840.



### DIN 1837 A fine-toothed with Type A double helical tooth

- Straight teeth with relatively small tooth pockets
- For thin-walled workpieces and smaller cutting depths
- Ideal for machining brittle, short-chipping materials

### DIN 1838 B coarse-toothed with Type B curved tooth

- Curved teeth with relatively large tooth pockets
- More universal than DIN 1837 A thanks to improved chip formation and increased chip space
- For stronger material and greater cutting depths

### DIN 1838 C coarse-toothed with Type C curved tooth

- High-performance toothing (HZ) with taper tap and regroover
- The taper tap is 0.15-0.3 mm higher than the regroover and is tapered on both tooth corners.
- Thus both teeth share the task of machining.
- Ideal for separating workpieces with low to medium strength
- Excellent chip management is achieved by the chip-separating tooth form.

## Manufacturing accuracy according to DIN and ISO for HSS metal circular saw blades

**Diameter tolerance according to ISO**

Nominal dimension range mm	Nominal dimension range mm					
	30 - 50	50 - 80	80-120	120-180	180-250	250 - 315
Tolerance field in accordance with js 15 (µm)	± 500	± 600	± 700	± 800	± 925	± 1050

**Thickness tolerance according to ISO**

Nominal dimension range mm	Nominal dimension range mm		
	≤ 1	1 - 3	3 - 6
Tolerance field in accordance with js 11 (µm)	± 20	± 30	± 38

**Bore tolerance according to ISO**

Nominal dimension range mm	Nominal dimension range mm					
	3 - 6	6 - 10	10 - 18	18 - 30	30 - 50	50 - 80
Tolerance field in accordance with js 15 (µm)	+ 12 - 0	+ 15 - 0	+ 18 - 0	+ 21 - 0	+ 25 - 0	+ 30 - 0

**Radial run-out according to DIN 1840**

External Ø mm	Perm. deviation mm
≤ 100	0.10
> 100	0.16

**Front run-out (lateral run-out) according to DIN 1840**

External Ø mm	Perm. deviation mm
≤ 40	0.10
> 40-100	0.16
> 100-200	0.25
> 200-315	0.40

**SARA® Solid carbide circular saw blade****• Tooth type A**

- For small cutting depths and short-chipping material
- Please adjust these guideline values according to clamping operation and machine set-up!

202001....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz mm/tooth	Coolant / lubricant
P	Steel	Up to 700	St-52	1.0052	150	0.010 - 0.03	Emulsion 1:20
	Steel	Up to 1000	16 MnCr 5	1.7131	120	0.005 - 0.02	Emulsion 1:10
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.005 - 0.015	Emulsion 1:10
K	Grey cast iron	100 - 400	GG 25	0.6025	100	0.005 - 0.010	Dry
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	60	0.003 - 0.005	Cutting oil
N	Copper alloys				300	0.02 - 0.040	Emulsion
	Brass alloys				500	0.010 - 0.040	Emulsion
	Aluminium				1,000 - 2,000	0.010 - 0.040	Emulsion

**SARA® Solid carbide circular saw blade****• Tooth type B**

- For solid materials, large cutting depths and long-chipping material
- Please adjust these guideline values according to clamping operation and machine set-up!

202002....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz mm/tooth	Coolant / lubricant
P	Steel	Up to 700	St-52	1.0052	150	0.010 - 0.03	Emulsion 1:20
	Steel	Up to 1000	16 MnCr 5	1.7131	120	0.005 - 0.02	Emulsion 1:10
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.005 - 0.015	Emulsion 1:10
K	Grey cast iron	100 - 400	GG 25	0.6025	100	0.005 - 0.010	Dry
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	60	0.003 - 0.005	Cutting oil
N	Copper alloys				300	0.02 - 0.040	Emulsion
	Brass alloys				500	0.010 - 0.040	Emulsion
	Aluminium				1,000 - 2,000	0.010 - 0.040	Emulsion



YOUR DRILL  
**GIVES UP.** • WHAT DO YOU DO? YOU REACH  
**FOR A NEW ONE**

AND SIMPLY CARRY ON:  
**SARA® GO TOOL DISPENSING SYSTEM.**

THAT'S POWER TO PRODUCE

**SARATOOLS.com**  
**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE



## SARA® Metal circular saw blade, precision version

200150....

200151....

- Choose the correct tooth pitch in relation to the materials to be cut
- Feed, in relation to the materials to be cut and the selected tooth pitch
- Rotational speed, in relation to the materials to be cut and the saw blade diameter
- The data relates to the circular saw blades with standard surface. Surface coatings can increase the feed and revolution values.
- When cutting ensure the saw blade is correctly tensioned, as well as sufficient cooling, correct machine operation and optimum condition of the saw blade.
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Tooth pitch											
			Pipes / profiles, wall thickness mm					Solid material, cross section mm						
			< 1	1 - 1.5	1.5 - 2	2 - 3	> 3	10 - 20	20 - 40	40 - 60	60 - 90	90 - 110	110 - 130	130 - 150
P	Steel	Up to 500	3	4	4	5	≥ 6	5	8	10	12	14	16	18
	Steel	Up to 600	3	4	4	5	≥ 6	5	6	1	12	14	16	16
	Steel	Up to 1200	3	3	4	4	≥ 5	4	6	8	10	12	14	14
M	Stainless steel, austenitic		3	4	4	5	≥ 6	4	6	8	11	14	16	16
K	Grey cast iron							5	6	8	11	14	16	16
N	Bronze and copper		4	5	6	7	≥ 8	6	8	10	12 - 14	14 - 16	16 - 18	18 - 20
	Aluminium alloys		4	5	6	7	≥ 8	6	8	12	16	18	20	20
	Brass alloys		4	4	5	5	≥ 8	6	8	10	12	16	18	18

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Feed mm/min.																	
			Pipes / profiles, for tooth pitch								Solid material, for tooth pitch									
			3	4	5	6	8	10	12	14	16	3	4	5	6	8	10	12	14	16
P	Steel	Up to 500	450	400	350	300	250	200	150	130	120	350	300	250	200	150	100	80	70	50
	Steel	Up to 600	350	300	250	180	130	100	90	80	70	250	200	150	100	80	70	65	60	55
	Steel	Up to 1200	160	140	130	120	90	80	65	50	40	90	80	70	60	45	40	35	25	15
M	Stainless steel, austenitic		150	130	110	90	75	60	55	50	35	70	60	55	50	40	35	30	20	15
K	Grey cast iron		550	440	350	300	220	180	150	125	110	350	280	210	180	140	120	90	75	65
N	Bronze and copper					2.000	1.600	1.200	850	700	600				1.400	1.000	700	550	500	400
	Aluminium alloys						8.500	6.000	5.000	4.600	3.700					4.500	3.800	3.000	2.800	3.700
	Brass alloys					4.000	3.200	2.500	1.800	1.400	1.000				2.000	1.500	1.000	800	700	600

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Rotational speed rpm																	
			Pipes / profiles, for saw blade Ø mm									Solid material, for saw blade Ø mm								
			200	225	250	275	300	315	350	370	400	200	225	250	275	300	315	350	370	400
P	Steel	Up to 500	80	70	65	60	55	50	45	45	5	45	45	40	35	30	30	25	25	5
	Steel	Up to 600	65	60	50	45	45	40	35	35	40	30	30	25	25	20	20	20	15	20
	Steel	Up to 1200	40	35	30	30	25	25	25	20	30	25	20	20	15	15	15	15	15	15
M	Stainless steel, austenitic		35	30	25	25	20	20	20	15	20	15	15	15	10	10	10	10	10	10
K	Grey cast iron		80	70	65	60	55	50	45	45	40	45	45	40	35	30	30	25	25	20
N	Bronze and copper		480	430	380	350	350	300	270	260	240	320	300	250	230	210	200	180	170	160
	Aluminium alloys		1500	1250	1100	1050	950	900	820	770	720	950	850	750	700	650	600	550	520	470
	Brass alloys		950	850	770	700	640	600	550	520	480	650	550	500	450	430	400	350	350	300

### SOLID CARBIDE MILLING CUTTERS

# AT THEIR BEST

VAN HOORN <sup>3</sup>CARBIDE



**VAN HOORN**  
End milling cutters  
189 pages  
Art.no. 019900 0079

Overview of all free manufacturers' catalogues on page 16/17

## Calculation of HSS-E milling cutter

### Note:

- Please use the tables on pages 20-14 to 20-17 to assign the materials to be machined.
- All milling specifications apply to a rigid setup, including clamping, sufficient machine output and applications of coolant.
- Please adjust these guideline values according to clamping operation and machine set-up!
- The feed (Vf) should be halved for milling in long version.

### 1. Table

Please see Table 1 for the cutting speed of the respective material.

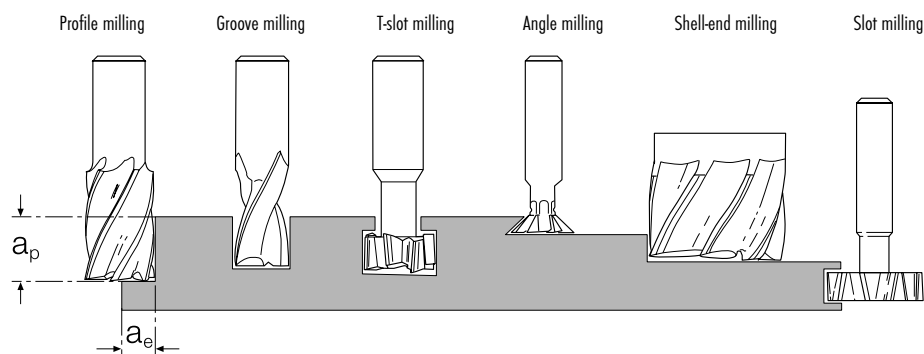
ISO	Material	Hardness HB	Tensile strength N/mm <sup>2</sup>	Cutting speed Vc m/min.
P	magnetic, soft steel	< 120	< 400	40
	Structural steel, steel for case hardening	< 200	< 700	32
	Carbon steel, unalloyed	< 250	< 850	25
	Alloyed steel	< 250	< 850	25
	Alloyed steel, hardened and tempered	250-350	850-1.200	20
	Alloyed steel, hardened and tempered	> 350	> 1200	12
M	Good machinability	< 250	< 850	20
	austenitic	< 250	< 850	16
	ferritic, austenitic	< 300	< 1000	12
K	with lamellar graphite	< 150	< 500	32
	with lamellar graphite	150-300	500-1.000	25
	with spheroidal graphite, malleable cast iron	< 200	< 700	32
	with spheroidal graphite, malleable cast iron	200-300	700-1.000	20
S	Titanium, unalloyed	< 200	< 700	16
	Titanium, alloyed	< 270	< 900	12
	Titanium, alloyed	270-350	900-1.250	10
	Nickel, unalloyed	< 150	< 500	8
	Nickel, alloyed	> 270	< 900	8
	Nickel, alloyed	270-350	900-1.200	6
N	Copper	< 100	< 350	80
	Brass, bronze	< 200	< 700	40
	Brass	< 200	< 700	50
	High-strength bronze	< 470	< 1500	16
	Aluminium, magnesium, non-alloyed	< 100	< 350	100
	Aluminium alloyed, Si < 5%	< 150	< 500	80
	Aluminium alloyed, Si 5-10%	< 120	< 400	60
	Aluminium alloyed, Si > 10%			
	Whisker-reinforced Aluminium and aluminium alloy	< 120	< 400	50
	Thermoplastics	-	-	80
	Thermoset plastics	-	-	60
Fibre-reinforced plastics	-	-	60	

### 2. Table

Using the cutting speed (Vc) from Table 1, you obtain the rotational speed depending on the diameter of the tool use.

∅ mm	Cutting speed Vc m/min.															
	6	8	10	12	16	20	25	32	40	50	60	80	100	125	160	200
	Rotational speed rev/min.															
2	955	1.273	1.592	1.910	2.546	3.183	3.979	5.093	6.366	7.958	9.549	12.732	15.915	19.894	25.465	31.831
2.5	764	1.019	1.273	1.528	2.037	2.546	3.183	4.074	5.093	6.366	7.639	10.186	12.732	15.915	20.372	25.465
3	637	849	1.061	1.273	1.698	2.122	2.653	3.395	4.244	5.305	6.366	8.488	10.610	13.263	16.977	21.221
4	477	637	796	955	1.273	1.592	1.989	2.546	3.183	3.979	4.775	6.366	7.958	9.947	12.732	15.915
5	382	509	637	764	1.019	1.273	1.592	2.037	2.546	3.183	3.820	5.093	6.366	7.958	10.186	12.732
6	318	424	531	637	849	1.061	1.326	1.698	2.122	2.653	3.183	4.244	5.305	6.631	8.488	10.610
8	239	318	398	477	637	796	995	1.273	1.592	1.989	2.387	3.183	3.979	4.974	6.366	7.958
10	191	255	318	382	509	637	796	1.019	1.273	1.592	1.910	2.546	3.183	3.979	5.093	6.366
12	159	212	265	318	424	531	663	849	1.061	1.326	1.592	2.122	2.653	3.316	4.244	5.305
16	119	159	199	239	318	398	497	637	796	995	1.194	1.592	1.989	2.487	3.183	3.979
20	95	127	159	191	255	318	398	509	637	796	955	1.273	1.592	1.989	2.546	3.183
25	76	102	127	153	204	255	318	407	509	637	764	1.019	1.273	1.592	2.037	2.546
32	60	80	99	119	159	199	249	318	398	497	597	796	995	1.243	1.592	1.989
40	48	64	80	95	127	159	199	255	318	398	477	637	796	995	1.273	1.592
50	38	51	64	76	102	127	159	204	255	318	382	509	637	796	1.019	1.273
63	30	40	51	61	81	101	126	162	202	253	303	404	505	632	808	1.011
80	24	32	40	48	64	80	99	127	159	199	239	318	398	497	637	796
100	19	25	32	38	51	64	80	102	127	159	191	255	318	398	509	637
125	15	20	25	31	41	51	64	81	102	127	153	204	255	318	407	509
160	12	16	20	24	32	40	50	64	80	99	119	159	199	249	318	398

### Calculation of HSS-E milling cutter Continued



**3. Table**

The cross section to be machined can be selected here. This also indicates the recommended tool type and the feed code letter.

	Tool application																							
	Profile milling												Groove milling				Special							
	0.125 XD			0.25 XD			0.5 XD			0.75 XD			1 XD		0.5 XD	0.25 XD	0.75 XD							
Radial cutting width ae	1.25 XD	1.5 XD	2 XD	1.25 XD	1.5 XD	2 XD	1.25 XD	1.5 XD	2 XD	1.25 XD	1.5 XD	2 XD	0.5 XD	1 XD	1.5 XD	2 XD	0.5 XD	0.5 XD	3 mm	6 mm	10 mm	6 mm	12 mm	20 mm
Disposable milling cutter	-	-	-	-	-	-	J	I	H	G	E	C	L	F	-	-	-	-	-	-	-	-	-	-
2-flute cutter	-	-	-	-	-	-	-	-	-	-	-	-	J	E	-	-	-	-	-	-	-	-	-	-
3-flute cutter	-	-	-	-	-	-	I	H	G	F	D	B	J	E	-	-	-	-	-	-	-	-	-	-
3-flute cutter, aluminium	-	-	-	-	-	-	M	L	J	I	G	F	N	H	E	-	-	-	-	-	-	-	-	-
Multi-flute cutter	P	P	M	N	L	I	K	I	G	-	-	-	L	J	F	C	-	-	-	-	-	-	-	-
Roughing cutter	-	-	-	-	-	-	L	L	L	J	H	F	L	J	F	C	-	-	-	-	-	-	-	-
Roughing cutter (fine)	-	-	-	-	-	-	M	M	M	M	K	I	M	M	I	E	-	-	-	-	-	-	-	-
T-slot milling cutter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	J	-	-	-	-	-	-	-
Slotting cutter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-
Angle milling cutter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G	-	-	-	-	-	-
Shell-end milling cutter (finishing)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	J	J	H	-	-	-
Shell-end milling cutter (roughing)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	J	J	H

**4. Table**

The cutting speed from Table 1 and the feed code letter from Table 3 produce the feed (Vf) in Table 4.

Feed code letter	Cutting speed Vc m/min.															
	6	8	10	12	16	20	25	32	40	50	60	80	100	125	160	200
	Feed (Vf) mm/min.															
A	6	8	10	12	16	20	25	32	40	50	60	80	100	120	160	200
B	7	9	11	14	18	22	28	35	45	55	70	90	110	140	180	220
C	8	10	12	16	20	25	32	40	50	60	80	100	120	160	200	250
D	9	11	14	18	22	28	35	45	55	70	90	110	140	180	220	280
E	10	12	16	20	25	32	40	50	60	80	100	120	160	200	250	320
F	11	14	18	22	28	35	45	55	70	90	110	140	180	220	280	350
G	12	16	20	25	32	40	50	60	80	100	120	160	200	250	320	400
H	14	18	22	28	35	45	55	70	90	110	140	180	220	280	350	450
I	16	20	25	32	40	50	60	80	100	120	160	200	250	320	400	500
J	18	22	28	35	45	55	70	90	110	140	180	220	280	350	450	560
K	20	25	32	40	50	60	80	100	120	160	200	250	320	400	500	600
L	22	28	35	45	55	70	90	110	140	180	220	280	350	450	560	700
M	25	32	40	50	60	80	100	120	160	200	250	320	400	500	600	800
N	28	35	45	55	70	90	110	140	180	220	280	350	450	560	700	900
O	32	40	50	60	80	100	120	160	200	250	320	400	500	600	800	1000
P	35	45	55	70	90	110	140	180	220	280	350	450	560	700	900	1100

## ATORN® HSS-E-PM-milling cutter

## Groove milling

- Please adjust these guideline values according to clamping operation and machine set-up!
- The guide values apply for the TiAlN-coating version; for uncoated tools the cutting speeds must be reduced by 20-30%.



226215....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4 - 5	6 - 7	8 - 9	10	12 - 14	16 - 18	20	25 - 28
P	Machining steel	Up to 700	9 SMn 28	1.0715	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Unalloyed structural steel	Up to 700	St-52	1.0052	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Structural steel	700 - 950	Ck45	1.1191	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Cast steel	Up to 950	GS 40	1.0416	30 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	45 - 65	0.02	0.03	0.035	0.058	0.06	0.115	0.115	0.115
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	35 - 65	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Ductile iron	Up to 280 HB	GGG 60	0.7060	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	25 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 64 HRC		100Cr6	1.2067	10 - 20	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075

ae	ap	Correction factor
2-flute cutter 1 x D	0.5 x D	1
3-flute cutter 1 x D	0.5 x D	0.7

## ATORN® HSS-E-PM milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

226225....

226235....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4 - 5	6 - 7	8 - 9	10	12 - 14	16 - 18	20	25 - 28
P	Machining steel	Up to 700	9 SMn 28	1.0715	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Unalloyed structural steel	Up to 700	St-52	1.0052	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Structural steel	700 - 950	Ck45	1.1191	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Cast steel	Up to 950	GS 40	1.0416	30 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	45 - 65	0.02	0.03	0.035	0.058	0.06	0.115	0.115	0.115
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	35 - 65	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Ductile iron	Up to 280 HB	GGG 60	0.7060	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	25 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 64 HRC		100Cr6	1.2067	10 - 20	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075

ae	ap	Correction factor
0.10 x D	1.5 x D	1
0.25 x D	1.5 x D	0.7
0.50 x D	1.5 x D	0.4

## ATORN® HSS-E-PM milling cutter

• Please adjust these guideline values according to clamping operation and machine set-up!

226245....  
226265....  
226255....  
226275....  
226247....



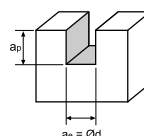
ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4 - 5	6 - 7	8 - 9	10	12 - 14	16 - 18	20	25 - 28
P	Machining steel	Up to 700	9 SMn 28	1.0715	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Unalloyed structural steel	Up to 700	St-52	1.0052	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Structural steel	700 - 950	Ck45	1.1191	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Cast steel	Up to 950	GS 40	1.0416	30 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	45 - 65	0.02	0.03	0.035	0.058	0.06	0.115	0.115	0.115
M	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
K	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Grey cast iron	Up to 260 HB	GG 25	0.6025	35 - 65	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Ductile iron	Up to 280 HB	GGG 60	0.7060	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
H	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	25 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Hardened materials up to 55 HRC		X40Cr14	1.2083	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 64 HRC		100Cr6	1.2067	10 - 20	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075

ae	ap	Correction factor
0.10 x D	1.5 x D	1
0.25 x D	1.5 x D	0.7
1 x D	1 x D	0.4

## ATORN® Mini end milling cutter, Mini torus milling cutter RockTec 52

• The lower Vc values apply respectively for long clearances and the smaller diameter range; the higher Vc values for short clearance lengths and the larger diameter range.  
This also applies for the specified ap max. values.

• Please adjust these guideline values according to clamping operation and machine set-up.



257001....

257009....

257023....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Diameter range ≤ 0.5 mm		Diameter range 0.6 - 1 mm		Diameter range > 1 mm		Feed fz in mm/tooth in relation to milling cutter diameter in mm		
					Vc m/min	ap max.	Vc m/min	ap max.	Vc m/min	ap max.	0.1 - 0.3	0.4-0.8	0.9 - 1.5
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 80	0.003 - 0.025	70 - 90	0.004 - 0.05	80-100	0.02 - 0.4	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 80	0.003 - 0.025	70 - 90	0.004 - 0.05	80-100	0.02 - 0.4	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 80	0.002 - 0.02	70 - 90	0.003 - 0.045	80-100	0.015 - 0.35	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 80	0.002 - 0.02	70 - 90	0.003 - 0.045	80-100	0.015 - 0.35	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
	Ductile iron	Up to 280 HB	GGG 60	0.7060	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	50 - 70	0.002 - 0.02	60 - 80	0.003 - 0.045	70 - 90	0.015 - 0.35	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	40 - 60	0.002 - 0.02	50 - 70	0.003 - 0.04	60 - 80	0.015 - 0.3	0.002 - 0.005	0.003 - 0.007	0.008 - 0.014
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	30 - 50	0.002 - 0.02	40 - 60	0.003 - 0.04	50 - 70	0.015 - 0.15	0.002 - 0.004	0.002 - 0.007	0.006 - 0.012

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Diameter range ≤ 0.5 mm		Diameter range 0.6 - 1 mm		Diameter range > 1 mm		Feed fz in mm/tooth in relation to milling cutter diameter in mm	
					Vc m/min	ap max.	Vc m/min	ap max.	Vc m/min	ap max.	1.6 - 2	2.5 - 3
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 80	0.003 - 0.025	70 - 90	0.004 - 0.05	80-100	0.02 - 0.4	0.014 - 0.025	0.018 - 0.035
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 80	0.003 - 0.025	70 - 90	0.004 - 0.05	80-100	0.02 - 0.4	0.014 - 0.025	0.018 - 0.035
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 80	0.002 - 0.02	70 - 90	0.003 - 0.045	80-100	0.015 - 0.35	0.014 - 0.025	0.018 - 0.035
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 80	0.002 - 0.02	70 - 90	0.003 - 0.045	80-100	0.015 - 0.35	0.014 - 0.025	0.018 - 0.035
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.014 - 0.025	0.018 - 0.035
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.014 - 0.025	0.018 - 0.035
	Ductile iron	Up to 280 HB	GGG 60	0.7060	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.014 - 0.025	0.018 - 0.035
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.014 - 0.025	0.018 - 0.035
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50 - 70	0.003 - 0.025	60 - 80	0.004 - 0.05	70 - 90	0.02 - 0.4	0.014 - 0.025	0.018 - 0.035
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	50 - 70	0.002 - 0.02	60 - 80	0.003 - 0.045	70 - 90	0.015 - 0.35	0.014 - 0.025	0.018 - 0.035
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	40 - 60	0.002 - 0.02	50 - 70	0.003 - 0.04	60 - 80	0.015 - 0.3	0.012 - 0.023	0.018 - 0.035
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	30 - 50	0.002 - 0.02	40 - 60	0.003 - 0.04	50 - 70	0.015 - 0.15	0.011 - 0.018	0.016 - 0.022

## Calculation: solid carbide end milling cutter

### Note:

- Please use the tables on pages 20-34 to 20-35 to assign the materials to be machined.
- All milling specifications apply to a rigid setup, including clamping, sufficient machine output and applications of coolant.
- Please adjust these guideline values according to clamping operation and machine set-up!
- The feed (Vf) should be halved for milling in long version.

### 1. Table

Please see Table 1 for the cutting speed of the respective material.

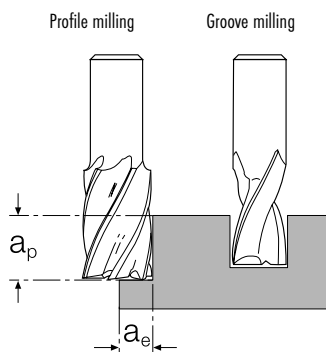
ISO	Material	Hardness HB	Tensile strength N/mm <sup>2</sup>	Cutting speed Vc m/min.
P	magnetic, soft steel	< 120	< 400	150
	Structural steel, steel for case hardening	< 200	< 700	120
	Carbon steel, unalloyed	< 250	< 850	96
	Alloyed steel	< 250	< 850	96
	Alloyed steel, hardened and tempered	250-350	850-1.200	72
	Alloyed steel, hardened and tempered	> 350	> 1200	48
M	Good machinability	< 250	< 850	96
	austenitic	< 250	< 850	72
	ferritic, austenitic	< 300	< 1000	60
K	with lamellar graphite	< 150	< 500	120
	with lamellar graphite	150-300	500-1.000	96
	with spheroidal graphite, malleable cast iron	< 200	< 700	120
	with spheroidal graphite, malleable cast iron	200-300	700-1.000	60
S	Titanium, unalloyed	< 200	< 700	72
	Titanium, alloyed	< 270	< 900	60
	Titanium, alloyed	270-350	900-1.250	38
	Nickel, unalloyed	< 150	< 500	72
	Nickel, alloyed	> 270	< 900	38
	Nickel, alloyed	270-350	900-1.200	24
N	Copper	< 100	< 350	300
	Brass, bronze	< 200	< 700	150
	Brass	< 200	< 700	192
	High-strength bronze	< 470	< 1500	60
	Aluminium, magnesium, non-alloyed	< 100	< 350	384
	Aluminium alloyed, Si < 5%	< 150	< 500	300
	Aluminium alloyed, Si 5-10%	< 120	< 400	192
	Aluminium alloyed, Si > 10% Whisker-reinforced	< 120	< 400	120
	Aluminium and aluminium alloy			
	Thermoplastics	-	-	300
Thermoset plastics	-	-	240	
Fibre-reinforced plastics	-	-	240	

### 2. Table

Using the cutting speed (Vc) from Table 1, you obtain the rotational speed depending on the diameter of the tool use.

Ø mm	Cutting speed Vc m/min.															
	14	19	24	30	38	48	60	72	96	120	150	192	240	300	384	480
	Rotational speed rev/min.															
2	2.292	3.055	3.820	4.775	6.112	7.639	9.550	11.459	15.278	19.098	23.873	30.558	38.197	47.747	61.116	76.394
2.5	1.834	2.444	3.055	3.820	4.889	6.112	7.639	9.167	12.223	15.278	19.098	24.446	30.558	38.197	48.893	61.116
3	1.528	2.038	2.546	3.184	4.074	5.093	6.366	7.639	10.186	12.732	15.916	20.372	25.465	31.831	40.744	50.929
4	1.146	1.528	1.910	2.387	3.055	3.820	4.775	5.730	7.639	9.550	11.936	15.278	19.098	23.873	30.558	38.197
5	917	1.223	1.528	1.910	2.444	3.055	3.820	4.584	6.112	7.639	9.550	12.223	15.278	19.098	24.446	30.558
6	764	1.019	1.273	1.591	2.038	2.546	3.184	3.820	5.093	6.366	7.957	10.186	12.732	15.916	20.372	25.465
8	572	764	955	1.194	1.528	1.910	2.387	2.864	3.820	4.775	5.969	7.639	9.550	11.936	15.278	19.098
10	458	611	764	955	1.223	1.528	1.910	2.292	3.055	3.820	4.775	6.112	7.639	9.550	12.223	15.278
12	382	509	637	796	1.019	1.273	1.591	1.910	2.546	3.184	3.979	5.093	6.366	7.957	10.186	12.732
16	287	382	478	596	764	955	1.194	1.433	1.910	2.387	2.984	3.820	4.775	5.969	7.639	9.550
20	229	306	382	478	611	764	955	1.146	1.528	1.910	2.387	3.055	3.820	4.775	6.112	7.639
25	184	245	306	382	488	611	764	917	1.223	1.528	1.910	2.444	3.055	3.820	4.889	6.112

### Calculation: solid carbide end milling cutterContinued



#### 3. Table

The cross section to be machined can be selected here. This also indicates the recommended tool type and the feed code letter.

	Tool application															
	Profile milling												Groove milling			
	0.125 X D			0.25 X D			0.5 X D			0.75 X D			1 X D			
Axial cut depth ap	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	0.5 X D	1 X D	1.5 X D	2 X D
2-flute cutter	-	-	-	-	-	-	-	-	-	-	-	-	J	E	-	-
3-flute cutter	-	-	-	-	-	-	I	H	G	F	D	B	J	E	-	-
4-flute cutter	P	P	M	N	L	I	K	I	G	-	-	-	-	-	-	-
60° milling cutter	N	N	K	O	J	G	I	G	E	-	-	-	-	-	-	-
2-flute cutter, aluminium	-	-	-	-	-	-	L	K	I	H	F	E	M	G	D	-
Roughing cutter	-	-	-	-	-	-	L	L	L	J	H	F	L	J	F	C
Roughing cutter (fine)	-	-	-	-	-	-	M	M	M	M	K	I	M	M	I	E

#### 4. Table

The cutting speed from Table 1 and the feed code letter from Table 3 produce the feed (Vf) in Table 4.

Feed code letter	Cutting speed Vc m/min.															
	14	19	24	30	38	48	60	72	96	120	150	192	240	300	384	480
	Feed (Vf) mm/min.															
A	12	14	19	24	30	38	48	60	72	96	120	144	192	240	300	384
B	13	17	22	26	34	42	54	66	84	108	132	168	216	264	336	420
C	14	19	24	30	38	48	60	72	96	120	144	192	240	300	384	480
D	17	22	26	34	42	54	66	84	108	132	168	216	264	336	420	540
E	19	24	30	38	48	60	72	96	120	144	192	240	300	384	480	600
F	22	26	34	42	54	66	84	108	132	168	216	264	336	420	540	672
G	24	30	38	48	60	72	96	120	144	192	240	300	384	480	600	720
H	26	34	42	54	66	84	108	132	168	216	264	336	420	540	672	840
I	30	38	48	60	72	96	120	144	192	240	300	384	480	600	720	960
J	34	42	54	66	84	108	132	168	216	264	336	420	540	672	840	1.080
K	38	48	60	72	96	120	144	192	240	300	384	480	600	720	960	1.200
L	42	54	66	84	108	132	168	216	264	336	420	540	672	840	1.080	1.320
M	48	60	72	96	120	144	192	240	300	384	480	600	720	960	1.200	1.440
N	54	66	84	108	132	168	216	264	336	420	540	672	840	1.080	1.320	1.680
O	60	72	96	120	144	192	240	300	384	480	600	720	960	1.200	1.440	1.920
P	66	84	108	132	168	216	264	336	420	540	672	840	1.080	1.320	1.680	2.160



## SARA® Solid carbide end milling cutter

- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						≤ Ø 2	≤ Ø 4	≤ Ø 8	≤ Ø 12	≤ Ø 16	≤ Ø 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	110 - 160	0.01	0.02	0.04	0.05	0.06	0.07
	Unalloyed structural steel	Up to 700	St-52	1.0052	90 - 160	0.01 - 0.015	0.02 - 0.03	0.04 - 0.05	0.05	0.06 - 0.07	0.07 - 0.08
	Cast steel	Up to 950	GS 40	1.0416	90 - 150	0.015	0.03	0.05	0.05	0.07	0.08
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	90 - 140	0.007 - 0.01	0.015 - 0.02	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.07
	Tempering steel	950 - 1300	43CrMo4	1.3563	80 - 120	0.007	0.015	0.03	0.04	0.05	0.06
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 110	0.007	0.015	0.03	0.04	0.05	0.06
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	70 - 84	0.005	0.01	0.02	0.03	0.04	0.05
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	70	0.005	0.01	0.02	0.03	0.04	0.05
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	90 - 156	0.007 - 0.018	0.015 - 0.035	0.03 - 0.06	0.04 - 0.07	0.05 - 0.09	0.06 - 0.12
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	104 - 156	0.005 - 0.015	0.01 - 0.03	0.02 - 0.05	0.03 - 0.05	0.04 - 0.07	0.05 - 0.08
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130 - 156	0.018	0.035	0.06	0.07	0.09	0.12
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	100	0.01	0.02	0.04	0.06	0.08	0.12
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	120	0.01	0.02	0.04	0.06	0.08	0.12
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	120	0.01	0.02	0.04	0.06	0.08	0.12
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	140	0.01	0.02	0.04	0.06	0.08	0.12
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	150	0.01	0.02	0.04	0.06	0.08	0.12
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	200	0.01	0.02	0.04	0.06	0.08	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 50	0.01	0.01	0.02	0.03	0.04	0.05
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0.01	0.01	0.02	0.03	0.04	0.05

### Cutting speed and feed correction factors

ae	10%	20%	50%	100%
Factor for Vc	1.3	1.1	1	0.85
Factor for fz	1.5	1.3	1	0.8

## Solid carbide high-performance end milling cutter



### Note:

The recommended cutting data are guide values for conventional roughing and assume stable machine conditions, low-vibration workpiece clamping and the application of suitable cooling lubricant. The cutting speed Vc can be increased by 20% for finishing. For full slot milling we recommend reducing the cutting speed Vc by approx. 15% and the feed Vf mm/min by 30%.

251033....

ISO	Grooving ap: 1.00 x D/ ae: 1.00 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter range in mm				
						3-4	5 - 6	8-10	12 - 16	18 - 25
P	Unalloyed structural steel	Up to 700	St-52	1.0052	156	0.01	0.029	0.038	0.063	0.101
	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.01	0.029	0.038	0.063	0.101
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	127	0.01	0.029	0.038	0.063	0.101
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	99	0.008	0.021	0.027	0.044	0.071
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	85	0.008	0.021	0.027	0.044	0.071
	Cast steel	Up to 950	GS 40	1.0416	105	0.01	0.029	0.038	0.063	0.101
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	156	0.01	0.029	0.038	0.063	0.101
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	53	0.008	0.021	0.027	0.044	0.071
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	53	0.008	0.021	0.027	0.044	0.071
K	Grey cast iron	100 - 400	GG 25	0.6025	127	0.01	0.029	0.038	0.063	0.101
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	99	0.01	0.029	0.038	0.063	0.101
	Ductile iron	400 - 800	GGG 60	0.7060	99	0.01	0.029	0.038	0.063	0.101
	Malleable cast iron	350 - 700	GTS 55	0.8155	99	0.01	0.029	0.038	0.063	0.101
S	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	25	0.006	0.013	0.021	0.027	0.059
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	25	0.006	0.013	0.021	0.027	0.059

ISO	Finishing / Edge-banding ap: 1.00 x D/ ae: 0.50 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter range in mm				
						3-4	5 - 6	8-10	12 - 16	18 - 25
P	Unalloyed structural steel	Up to 700	St-52	1.0052	156	0.012	0.035	0.045	0.075	0.12
	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.012	0.035	0.045	0.075	0.12
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	127	0.012	0.035	0.045	0.075	0.12
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	99	0.009	0.025	0.032	0.052	0.084
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	85	0.009	0.025	0.032	0.052	0.084
	Cast steel	Up to 950	GS 40	1.0416	105	0.012	0.035	0.045	0.075	0.12
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	156	0.012	0.035	0.045	0.075	0.12
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	53	0.009	0.025	0.032	0.052	0.084
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	53	0.009	0.025	0.032	0.052	0.084
K	Grey cast iron	100 - 400	GG 25	0.6025	127	0.012	0.035	0.045	0.075	0.12
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	99	0.012	0.035	0.045	0.075	0.12
	Ductile iron	400 - 800	GGG 60	0.7060	99	0.012	0.035	0.045	0.075	0.12
	Malleable cast iron	350 - 700	GTS 55	0.8155	99	0.012	0.035	0.045	0.075	0.12
S	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	25	0.007	0.015	0.025	0.032	0.07
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	25	0.007	0.015	0.025	0.032	0.07

**VAN HOORN CARBIDE End milling cutter VHSW Z4**



• Please adjust these guideline values according to clamping operation and machine set-up!

255100 ...

ISO	Roughing / Grooving fz for ae = 1.0 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						3	4	5	6	8	10	12	14	16	20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Structural steel	700 - 950	Ck45	1.1191	200	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Cast steel	Up to 950	GS 40	1.0416	130	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	180	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	90	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	100	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	160	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	100	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110

ISO	Finishing / Edge-banding fz for ae = 0.5 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						3	4	5	6	8	10	12	14	16	20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Unalloyed structural steel	Up to 700	St-52	1.0052	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Structural steel	700 - 950	Ck45	1.1191	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Cast steel	Up to 950	GS 40	1.0416	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	130	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125

## ATORN® End milling cutter VHRSW Z5



• Please adjust these guideline values according to clamping operation and machine set-up!

255101 ....

ISO	Finishing / Edge-banding fz for ae = 0.5 x D and ap = 1.0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						3	4	5	6	8	10	12	14	16	20	25
	Materials group															
P	Machining steel	Up to 700	9 SMn 28	1.0715	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Unalloyed structural steel	Up to 700	St52	1.0052	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Structural steel	700 - 950	Ck45	1.1191	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Cast steel	Up to 950	GS 40	1.0416	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
K	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	130	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	180	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
S	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
H	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Hardened materials up to 55 HRC		X40Cr14	1.2083	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125



## Solid carbide milling cutter VHVFFW3 and VHRFFW3/4

• Please adjust these guideline values according to clamping operation and machine set-up!

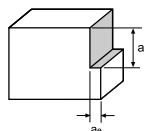
254015....

ISO	Roughing / Grooving fz for ae = 1.0 x D and ap = 1.0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						3	4	5	6	8	10	12	14	16	20
	Materials group														
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Unalloyed structural steel	Up to 700	St52	1.0052	200	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Structural steel	700 - 950	Ck45	1.1191	200	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Cast steel	Up to 950	GS 40	1.0416	180	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	130	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
K	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	80	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Grey cast iron	Up to 260 HB	GG 25	0.6025	140	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	90	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06

ISO	Finishing / Edge-banding fz for ae = 0.5 x D and ap = 1.0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						3	4	5	6	8	10	12	14	16	20
	Materials group														
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Unalloyed structural steel	Up to 700	St52	1.0052	200	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Structural steel	700 - 950	Ck45	1.1191	200	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Cast steel	Up to 950	GS 40	1.0416	180	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	130	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
K	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	80	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Grey cast iron	Up to 260 HB	GG 25	0.6025	140	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	90	0.015	0.02	0.025	0.03	0.035	0.045	0.055	0.06	0.065	0.08

## ATORN® End milling cutter, multi-flute milling cutter, torus cutter RockTec 52

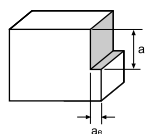
- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae max.	ap max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	0.2 x D	1.5 x D	140 - 160	0.02	0.04	0.06	0.09	0.12	0.15
	Tempering steel	500 - 950	42 CrMo4	1.7225	0.2 x D	1.5 x D	130 - 150	0.02	0.03	0.05	0.07	0.1	0.12
	Tempering steel	950 - 1300	43CrMo4	1.3563	0.2 x D	1.5 x D	120 - 140	0.02	0.03	0.04	0.06	0.08	0.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	120 - 140	0.02	0.03	0.04	0.06	0.08	0.1
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	0.2 x D	1.5 x D	100 - 120	0.02	0.03	0.05	0.06	0.08	0.1
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0.2 x D	1.5 x D	100 - 120	0.02	0.03	0.04	0.06	0.08	0.1
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0.2 x D	1.5 x D	100 - 120	0.02	0.03	0.04	0.06	0.08	0.1
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0.2 x D	1.5 x D	100 - 120	0.02	0.03	0.04	0.06	0.08	0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	80-100	0.02	0.03	0.04	0.06	0.08	0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	80-100	0.02	0.03	0.04	0.06	0.08	0.1
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.2 x D	1.5 x D	70 - 90	0.02	0.03	0.04	0.06	0.08	0.1
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.05 x D	1 x D	60 - 80	0.01	0.02	0.03	0.04	0.06	0.07

## ATORN® End milling cutter, torus milling cutter RockTec 52

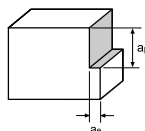
- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae max.	ap max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	0.2 x D	1.5 x D	120 - 140	0.02	0.04	0.06	0.09	0.12	0.15
	Tempering steel	500 - 950	42 CrMo4	1.7225	0.2 x D	1.5 x D	110 - 130	0.02	0.03	0.05	0.07	0.1	0.12
	Tempering steel	950 - 1300	43CrMo4	1.3563	0.2 x D	1.5 x D	100 - 120	0.02	0.03	0.04	0.06	0.08	0.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	100 - 120	0.02	0.03	0.04	0.06	0.08	0.1
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	0.2 x D	1.5 x D	90 - 110	0.02	0.03	0.05	0.06	0.08	0.1
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0.2 x D	1.5 x D	90 - 110	0.02	0.03	0.04	0.06	0.08	0.1
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0.2 x D	1.5 x D	90 - 110	0.02	0.03	0.04	0.06	0.08	0.1
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0.2 x D	1.5 x D	90 - 110	0.02	0.03	0.04	0.06	0.08	0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	70 - 90	0.02	0.03	0.04	0.06	0.08	0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	70 - 90	0.02	0.03	0.04	0.06	0.08	0.1
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.2 x D	1.5 x D	60 - 80	0.02	0.03	0.04	0.06	0.08	0.1
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.05 x D	1 x D	50 - 70	0.01	0.02	0.03	0.04	0.06	0.07

## ATORN® End milling cutter, torus milling cutter RockTec 52

- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae max.	ap max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Tempering steel	950 - 1300	43CrMo4	1.3563	0.2 x D	1.5 x D	120 - 140	0.02	0.04	0.08	0.1	0.11	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	120 - 140	0.02	0.04	0.08	0.1	0.11	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	130 - 170	0.02	0.04	0.08	0.1	0.1	0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	130 - 170	0.02	0.04	0.08	0.1	0.1	0.1
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.05 x D	1 x D	80 - 110	0.02	0.03	0.06	0.08	0.09	0.1
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.03-0.05 x D	1 x D	50 - 80	0.015	0.025	0.05	0.06	0.07	0.08

## SARA® End milling cutter Steel



• Please adjust these guideline values according to clamping operation and machine set-up!

254111 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
Materials group															
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0,012	0,016	0,019	0,026	0,033	0,041	0,047	0,053	0,059	0,065
	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0,012	0,016	0,019	0,026	0,033	0,041	0,047	0,053	0,059	0,065
	Structural steel	700 - 950	Ck45	1.1191	160	0,012	0,016	0,019	0,026	0,034	0,041	0,047	0,053	0,058	0,064
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0,013	0,016	0,020	0,028	0,036	0,043	0,049	0,055	0,061	0,067
	Cast steel	Up to 950	GS 40	1.0416	140	0,013	0,017	0,021	0,029	0,038	0,046	0,052	0,058	0,065	0,071
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	130	0,014	0,018	0,022	0,031	0,040	0,049	0,055	0,062	0,069	0,075
	Tempering steel	950 - 1300	43CrMo4	1.3563	120	0,015	0,020	0,024	0,033	0,043	0,052	0,059	0,066	0,073	0,080
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	120	0,014	0,018	0,022	0,030	0,039	0,047	0,054	0,061	0,067	0,073
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	120	0,014	0,018	0,022	0,030	0,039	0,047	0,054	0,061	0,067	0,073
	M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	80	0,016	0,020	0,025	0,034	0,043	0,054	0,062	0,069	0,076
Stainless steel, austenitic		500 - 950	X5 CrNi 18 10	1.4301	110	0,013	0,016	0,020	0,027	0,035	0,043	0,049	0,055	0,061	0,066
K	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	80	0,016	0,020	0,025	0,034	0,043	0,054	0,062	0,069	0,076	0,083
	Grey cast iron	Up to 260 HB	GG 25	0.6025	170	0,012	0,015	0,019	0,026	0,034	0,042	0,048	0,054	0,060	0,065
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	130	0,014	0,018	0,022	0,030	0,039	0,049	0,055	0,061	0,067	0,074
N	Ductile iron	Up to 280 HB	GGG 60	0.7060	130	0,014	0,017	0,021	0,029	0,038	0,047	0,053	0,059	0,065	0,071
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	130	0,013	0,017	0,021	0,029	0,037	0,046	0,052	0,057	0,063	0,069
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	330	0,016	0,021	0,026	0,037	0,048	0,060	0,068	0,075	0,083	0,090
S	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	300	0,015	0,020	0,026	0,036	0,048	0,061	0,070	0,078	0,084	0,089
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	220	0,013	0,017	0,021	0,029	0,038	0,048	0,054	0,062	0,069	0,074
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	240	0,014	0,018	0,023	0,032	0,043	0,053	0,061	0,069	0,075	0,081
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	260	0,015	0,019	0,025	0,035	0,046	0,058	0,066	0,075	0,081	0,087
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	280	0,015	0,020	0,026	0,037	0,049	0,062	0,071	0,080	0,086	0,092
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0,018	0,024	0,029	0,040	0,051	0,063	0,072	0,080	0,087	0,095
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0,019	0,025	0,033	0,048	0,063	0,078	0,088	0,096	0,104	0,104

ISO	Finishing / Edge-banding fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
Materials group															
P	Machining steel	Up to 700	9 SMn 28	1.0715	280	0,017	0,022	0,027	0,037	0,047	0,057	0,065	0,072	0,079	0,085
	Unalloyed structural steel	Up to 700	St-52	1.0052	280	0,017	0,022	0,027	0,037	0,047	0,057	0,065	0,072	0,079	0,085
	Structural steel	700 - 950	Ck45	1.1191	230	0,014	0,018	0,023	0,032	0,042	0,052	0,059	0,065	0,069	0,073
	Tempering steel	500 - 950	42 CrMo4	1.7225	220	0,013	0,017	0,022	0,031	0,040	0,050	0,056	0,062	0,067	0,070
	Cast steel	Up to 950	GS 40	1.0416	210	0,012	0,017	0,021	0,029	0,038	0,048	0,053	0,059	0,064	0,067
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	200	0,012	0,016	0,020	0,027	0,035	0,045	0,050	0,056	0,061	0,063
	Tempering steel	950 - 1300	43CrMo4	1.3563	190	0,011	0,015	0,018	0,024	0,033	0,042	0,046	0,052	0,057	0,059
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	160	0,010	0,013	0,016	0,022	0,028	0,035	0,039	0,043	0,046	0,050
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	160	0,010	0,013	0,016	0,022	0,028	0,035	0,039	0,043	0,046	0,050
	M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	100	0,010	0,013	0,017	0,023	0,029	0,037	0,041	0,044	0,045
Stainless steel, austenitic		500 - 950	X5 CrNi 18 10	1.4301	140	0,010	0,013	0,016	0,022	0,028	0,036	0,039	0,043	0,046	0,048
K	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	100	0,010	0,013	0,017	0,023	0,029	0,037	0,041	0,044	0,045	0,049
	Grey cast iron	Up to 260 HB	GG 25	0.6025	250	0,017	0,022	0,027	0,037	0,047	0,057	0,065	0,071	0,077	0,084
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	190	0,010	0,012	0,016	0,021	0,028	0,035	0,040	0,045	0,049	0,052
N	Ductile iron	Up to 280 HB	GGG 60	0.7060	180	0,010	0,012	0,016	0,022	0,028	0,035	0,040	0,045	0,048	0,051
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	170	0,010	0,012	0,016	0,022	0,028	0,035	0,039	0,044	0,047	0,051
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400	0,020	0,027	0,034	0,047	0,061	0,076	0,087	0,097	0,106	0,115
S	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	380	0,020	0,027	0,034	0,048	0,062	0,077	0,086	0,095	0,102	0,110
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	300	0,018	0,023	0,029	0,040	0,051	0,063	0,071	0,079	0,086	0,091
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	320	0,019	0,025	0,031	0,043	0,055	0,069	0,077	0,084	0,091	0,097
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	340	0,019	0,026	0,033	0,046	0,059	0,073	0,082	0,089	0,096	0,102
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	360	0,020	0,027	0,034	0,048	0,062	0,077	0,086	0,094	0,100	0,106
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	70	0,009	0,011	0,014	0,020	0,026	0,032	0,036	0,040	0,044	0,047
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0,007	0,010	0,013	0,019	0,024	0,033	0,033	0,038	0,039	0,039

## SARA® End milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254130....  
254131....

ISO	<b>Roughing</b> ap: 1.00 x d1   ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	141	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Unalloyed structural steel	Up to 700	St-52	1.0052	134	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Structural steel	700 - 950	Ck45	1.1191	127	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Tempering steel	500 - 950	42 CrMo4	1.7225	113	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Tempering steel	950 - 1300	43CrMo4	1.3563	85	0.005	0.013	0.015	0.015	0.027	0.027	0.027	0.044
M	Nitriding steel	950 - 1300	31CrMoV9	1.8519	57 - 120	0.008 - 0.01	0.013 - 0.017	0.021 - 0.029	0.021 - 0.029	0.027 - 0.038	0.027 - 0.038	0.027 - 0.038	0.044 - 0.063
	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	57	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	141	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Ductile iron	Up to 280 HB	GGG 60	0.7060	106	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	106	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063

ISO	<b>Roughing</b> ap: 1.00 x d1   ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	141	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Unalloyed structural steel	Up to 700	St-52	1.0052	134	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Structural steel	700 - 950	Ck45	1.1191	127	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Tempering steel	500 - 950	42 CrMo4	1.7225	113	0.044	0.044	0.044	0.059	0.059	0.071	0.071	0.077
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	57 - 120	0.044 - 0.063	0.044 - 0.063	0.044 - 0.063	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101	0.071 - 0.101	0.071 - 0.101
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	57	0.044	0.044	0.044	0.059	0.059	0.071	0.071	0.077
	Grey cast iron	Up to 260 HB	GG 25	0.6025	141	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	106	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	106	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109

ISO	<b>Finishing / Edge-banding</b> ap: 1.00 x d1   ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Structural steel	700 - 950	Ck45	1.1191	180	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Tempering steel	500 - 950	42 CrMo4	1.7225	160	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Tempering steel	950 - 1300	43CrMo4	1.3563	120	0.006	0.015	0.018	0.018	0.032	0.032	0.032	0.052
M	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 170	0.009 - 0.012	0.015 - 0.02	0.025 - 0.035	0.032 - 0.045	0.032 - 0.045	0.032 - 0.045	0.032 - 0.045	0.052 - 0.075
	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	150	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075

ISO	<b>Finishing / Edge-banding</b> ap: 1.00 x d1   ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Structural steel	700 - 950	Ck45	1.1191	180	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Tempering steel	500 - 950	42 CrMo4	1.7225	160	0.052	0.052	0.052	0.07	0.07	0.084	0.084	0.091
	Tempering steel	950 - 1300	43CrMo4	1.3563	120	0.052	0.052	0.052	0.07	0.07	0.084	0.084	0.091
M	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 170	0.052 - 0.075	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12	0.084 - 0.12	0.091 - 0.13
	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80	0.052	0.052	0.052	0.07	0.07	0.084	0.084	0.091
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	150	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13



## SARA® End milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254132....  
254140....  
254139....

ISO	Roughing ap: 1.00 x d1   ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1	D1	D1	D1	D1	D1	D1	D1
						5 fz	6 fz	8 fz	10 fz	12 fz	14 fz	16 fz	20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	113	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Unalloyed structural steel	Up to 700	St52	1.0052	106	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Structural steel	700 - 950	Ck45	1.1191	99	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Tempering steel	500 - 950	42 CrMo4	1.7225	85	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Tempering steel	950 - 1300	43CrMo4	1.3563	57	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	42 - 92	0.021 - 0.029	0.021 - 0.029	0.027 - -0.038	0.044 - 0.063	0.059 - -0.084	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	64	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Ductile iron	Up to 280 HB	GGG 60	0.7060	85	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	85	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
ISO	Finishing / Edge-banding ap: 1.00 x d1   ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1	D1	D1	D1	D1	D1	D1	D1
						5 fz	6 fz	8 fz	10 fz	12 fz	14 fz	16 fz	20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	160	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Unalloyed structural steel	Up to 700	St52	1.0052	150	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Structural steel	700 - 950	Ck45	1.1191	140	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	120	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Tempering steel	950 - 1300	43CrMo4	1.3563	80	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 130	0.025 - 0.035	0.025 - 0.035	0.032 - 0.045	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	90	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	170	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12



254133....

ISO	Roughing ap: 1.00 x d1   ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1	D1	D1	D1	D1	D1	D1	D1
						3 fz	4 fz	5 fz	6 fz	7 fz	8 fz	9 fz	10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	134	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Unalloyed structural steel	Up to 700	St52	1.0052	127	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Structural steel	700 - 950	Ck45	1.1191	120	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Tempering steel	500 - 950	42 CrMo4	1.7225	106	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Tempering steel	950 - 1300	43CrMo4	1.3563	78	0.005	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	57 - 113	0.008 - 0.01	0.013 - 0.017	0.021	0.021	0.027 - 0.038	0.027 - 0.038	0.044 - 0.063	0.059 - 0.084
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	53	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	25	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	134	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Ductile iron	Up to 280 HB	GGG 60	0.7060	99	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	99	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063

ISO	Roughing ap: 1.00 x d1   ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1	D1	D1	D1	D1	D1	D1	D1
						11 fz	12 fz	13 fz	14 fz	16 fz	18 fz	20 fz	25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	134	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Unalloyed structural steel	Up to 700	St52	1.0052	127	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Structural steel	700 - 950	Ck45	1.1191	120	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Tempering steel	500 - 950	42 CrMo4	1.7225	106	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Tempering steel	950 - 1300	43CrMo4	1.3563	78	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	57 - 113	0.044 - 0.063	0.044 - 0.063	0.059 - 0.084	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101	0.071 - 0.101	0.077 - 0.109
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	53	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	25	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	134	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Ductile iron	Up to 280 HB	GGG 60	0.7060	99	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	99	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109





254133....

ISO	Finishing / Edge-banding ap: 1.00 x d1   ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	190	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Unalloyed structural steel	Up to 700	St-52	1.0052	180	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Structural steel	700 - 950	Ck45	1.1191	170	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Tempering steel	950 - 1300	43CrMo4	1.3563	110	0.006	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 160	0.009 - 0.012	0.015 - 0.02	0.025	0.025	0.032 - 0.045	0.032 - 0.045	0.032 - 0.045	0.052 - 0.075
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	75	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	35	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	190	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075

ISO	Finishing / Edge-banding ap: 1.00 x d1   ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	190	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Unalloyed structural steel	Up to 700	St-52	1.0052	180	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Structural steel	700 - 950	Ck45	1.1191	170	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
	Tempering steel	950 - 1300	43CrMo4	1.3563	110	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 160	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12	0.084 - 0.12	0.091 - 0.13
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	75	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	35	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	190	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13

## SARA® Torus milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254019....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm	
						6 - 8	10 - 12
P	Machining steel	Up to 700	9 SMn 28	1.0715	80	590 - 615	590
	Unalloyed structural steel	Up to 700	St-52	1.0052	80	590 - 615	590
	Structural steel	700 - 950	Ck45	1.1191	70	420 - 425	420
	Cast steel	Up to 950	GS 40	1.0416	70	420 - 425	420
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	70	420 - 425	420
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70	420 - 425	420
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	35 - 45	125	125
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	40 - 50	130	130
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	100	710 - 735	710
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	90	700 - 725	700
	Ductile iron	Up to 280 HB	GGG 60	0.7060	95	705 - 730	705
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	95	705 - 730	705
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	25 - 30	65-70	60 - 65
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	15-20	35 - 40	30 - 35

	ap	ae
Material up to 45 HRc D up to 3 mm D more than 3 mm	1.5 x D 1.5 x D	0.05 x D 0.1 x D
Material from 45-60 HRc	1 x D	0.02 x D

HPMT End milling cutter

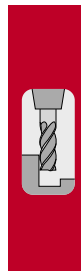


Please adjust these guideline values according to clamping operation and machine set-up!

254121....

ISO	Roughing ap: 1.00 x d1   ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						3	4	5	6	8	10	12	14	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 200	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Unalloyed structural steel	Up to 700	St-52	1.0052	150 - 200	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Structural steel	700 - 950	Ck45	1.1191	100 - 120	0,013	0,019	0,024	0,030	0,042	0,054	0,068	0,082	0,097	0,129
	Cast steel	Up to 950	GS 40	1.0416	100 - 120	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80 - 120	0,013	0,019	0,024	0,030	0,042	0,054	0,068	0,082	0,097	0,129
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70 - 90	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	40 - 70	0,011	0,016	0,022	0,028	0,040	0,053	0,068	0,084	0,101	0,138
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	70 - 100	0,012	0,019	0,026	0,035	0,051	0,070	0,091	0,114	1,140	0,198
K	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	40 - 70	0,011	0,016	0,022	0,028	0,040	0,053	0,068	0,084	0,101	0,138
	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 200	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	150 - 200	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150 - 200	0,009	0,013	0,018	0,024	0,036	0,049	0,063	0,079	0,096	0,136
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	150 - 200	0,009	0,013	0,018	0,024	0,036	0,049	0,063	0,079	0,096	0,136
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	280 - 350	0,025	0,025	0,025	0,025	0,040	0,045	0,050	0,055	0,055	0,060
S	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	200 - 250	0,025	0,025	0,025	0,025	0,040	0,045	0,050	0,055	0,055	0,060
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 70	0,031	0,019	0,026	0,034	0,050	0,067	0,080	0,108	0,132	0,184
H	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 25	0,031	0,019	0,026	0,034	0,050	0,067	0,080	0,108	0,132	0,184
	Hardened materials up to 55 HRC		X40Cr14	1.2083	50 - 70	0,031	0,019	0,026	0,034	0,050	0,067	0,080	0,108	0,132	0,184
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	40 - 60	0,031	0,019	0,026	0,034	0,050	0,067	0,080	0,108	0,132	0,184

ISO	Finishing / Edge-banding ap: 1.00 x d1   ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						3	4	5	6	8	10	12	14	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 200	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Unalloyed structural steel	Up to 700	St-52	1.0052	150 - 200	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Structural steel	700 - 950	Ck45	1.1191	100 - 120	0,021	0,030	0,038	0,048	0,067	0,086	0,109	0,131	0,155	0,206
	Cast steel	Up to 950	GS 40	1.0416	100 - 120	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80 - 120	0,021	0,030	0,038	0,048	0,067	0,086	0,109	0,131	0,155	0,206
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70 - 90	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	40 - 70	0,018	0,026	0,035	0,045	0,064	0,085	0,109	0,134	0,162	0,221
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	40 - 70	0,019	0,030	0,042	0,056	0,082	0,112	0,146	0,182	1,824	0,317
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 200	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	150 - 200	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150 - 200	0,014	0,021	0,029	0,038	0,058	0,078	0,101	0,126	0,154	0,218
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	150 - 200	0,014	0,021	0,029	0,038	0,058	0,078	0,101	0,126	0,154	0,218
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	280 - 350	0,040	0,040	0,040	0,040	0,064	0,072	0,080	0,088	0,088	0,096
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	200 - 250	0,040	0,040	0,040	0,040	0,064	0,072	0,080	0,088	0,088	0,096
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 70	0,050	0,030	0,042	0,054	0,080	0,107	0,128	0,173	0,211	0,294
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 25	0,050	0,030	0,042	0,054	0,080	0,107	0,128	0,173	0,211	0,294
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	50 - 70	0,050	0,030	0,042	0,054	0,080	0,107	0,128	0,173	0,211	0,294
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	40 - 60	0,050	0,030	0,042	0,054	0,080	0,107	0,128	0,173	0,211	0,294



OPTIMAL SOLUTIONS FOR  
**GRINDING**  
AND  
**CUTTING**



**PFERD**  
Grinding and cutting  
763 pages  
Art.no. 019900 0216

Overview of all free manufacturers' catalogues  
on page 16/17



**SARA® End milling cutter stainless steel**



• Please adjust these guideline values according to clamping operation and machine set-up!

**254134....**      **254136....**  
**254135....**

ISO	<b>Roughing</b> ap: 1.00 x d1   ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	163	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Unalloyed structural steel	Up to 700	Sr52	1.0052	148	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Structural steel	700 - 950	Ck45	1.1191	124	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Tempering steel	500 - 950	42 CrMo4	1.7225	106	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Tempering steel	950 - 1300	43CrMo4	1.3563	71	0.005	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	64 - 113	0.08 - 0.01	0.013 - 0.017	0.021	0.021	0.027 - 0.038	0.027 - 0.038	0.027 - 0.038	0.044 - 0.063
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	62	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	34	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	134	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Ductile iron	Up to 280 HB	GGG 60	0.7060	99	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	99	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	41	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	41	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044

ISO	<b>Roughing</b> ap: 1.00 x d1   ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	163	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Unalloyed structural steel	Up to 700	Sr52	1.0052	148	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Structural steel	700 - 950	Ck45	1.1191	124	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Tempering steel	500 - 950	42 CrMo4	1.7225	106	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Tempering steel	950 - 1300	43CrMo4	1.3563	71	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.084
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	64 - 113	0.044 - 0.063	0.044 - 0.063	0.059 - 0.084	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101	0.071 - 0.101	0.084 - 0.109
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	62	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	34	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	134	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Ductile iron	Up to 280 HB	GGG 60	0.7060	99	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	99	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	41	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	41	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077

ISO	<b>Finishing / Edge-banding</b> ap: 1.00 x d1   ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	230	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Unalloyed structural steel	Up to 700	Sr52	1.0052	210	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Structural steel	700 - 950	Ck45	1.1191	175	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Tempering steel	950 - 1300	43CrMo4	1.3563	100	0.006	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	90 - 160	0.09 - 0.012	0.015 - 0.02	0.025	0.025	0.032 - 0.045	0.052 - 0.075	0.052 - 0.075	0.052 - 0.075
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	88	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	48	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	190	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	58	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	58	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052

ISO	<b>Finishing / Edge-banding</b> ap: 1.00 x d1   ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	230	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Unalloyed structural steel	Up to 700	Sr52	1.0052	210	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Structural steel	700 - 950	Ck45	1.1191	175	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
	Tempering steel	950 - 1300	43CrMo4	1.3563	100	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.1
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	90 - 160	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12	0.084 - 0.12	0.1 - 0.13
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	88	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	48	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	190	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13

## SARA® Roughing cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254018....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						6	8	10	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	150	0.017	0.022	0.026	0.032	0.04	0.047
	Unalloyed structural steel	Up to 700	St-52	1.0052	150	0.017	0.022	0.026	0.032	0.04	0.047
	Structural steel	700 - 950	Ck45	1.1191	130	0.017	0.022	0.026	0.032	0.04	0.047
	Cast steel	Up to 950	GS 40	1.0416	120	0.017	0.022	0.026	0.032	0.04	0.047
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	130	0.017	0.022	0.026	0.032	0.04	0.047
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120	0.017	0.022	0.026	0.032	0.04	0.047
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	60	0.012	0.015	0.02	0.021	0.027	0.03
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	60	0.012	0.015	0.02	0.021	0.027	0.03
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120	0.014	0.017	0.021	0.023	0.027	0.03
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	60	0.012	0.015	0.018	0.02	0.025	0.028
	Ductile iron	Up to 280 HB	GGG 60	0.7060	80	0.014	0.017	0.021	0.023	0.027	0.03
H	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	80	0.014	0.017	0.021	0.023	0.027	0.03
	Hardened materials up to 55 HRC		X40Cr14	1.2083	80	0.012	0.015	0.02	0.021	0.023	0.025

	Groove milling	Profile milling	
	ap	ap	ae
Steel up to 1300 N/mm <sup>2</sup>	0.4 x D	1.5 x D	0.4 x D
Steel up to 1300 N/mm <sup>2</sup> - 2000 N/mm <sup>2</sup>	0.3 x D	1 x D	0.3 x D
Stainless steel	0.3 x D	1 x D	0.3 x D

## ATORN® HPC Power end milling cutter 3Z



• Please adjust these guideline values according to clamping operation and machine set-up!

254503....

ISO	Roughing / Grooving fz for ae = 1.0 x D and ap = 1.0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						4	5	6	8	10	12	14	16	18	20	
P	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220	
	Unalloyed structural steel	Up to 700	St-52	1.0052	180	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220	
	Structural steel	700 - 950	Ck45	1.1191	160	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200	
	Cast steel	Up to 950	GS 40	1.0416	105	0.03	0.040	0.050	0.07	0.09	0.1	0.140	0.140	0.170	0.170	
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	130	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200	
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	80	0.03	0.040	0.050	0.06	0.07	0.080	0.110	0.110	0.140	0.140	
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	
K	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	80	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	
	Grey cast iron	Up to 260 HB	GG 25	0.6025	145	0.06	0.07	0.080	0.110	0.140	0.170	0.220	0.220	0.280	0.280	
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	130	0.050	0.06	0.07	0.1	0.12	0.140	0.190	0.190	0.240	0.240	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220	
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	240	0.050	0.06	0.080	0.1	0.13	0.150	0.200	0.200	0.250	0.250	
S	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	200	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200	
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	25	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	

ISO	Finishing / Edge-banding fz for ae = 0.5 x D and ap = 1.0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						4	5	6	8	10	12	14	16	18	20	
P	Machining steel	Up to 700	9 SMn 28	1.0715	230	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220	
	Unalloyed structural steel	Up to 700	St-52	1.0052	230	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220	
	Structural steel	700 - 950	Ck45	1.1191	200	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200	
	Cast steel	Up to 950	GS 40	1.0416	130	0.03	0.040	0.050	0.07	0.09	0.1	0.140	0.140	0.170	0.170	
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	160	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200	
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	100	0.03	0.040	0.050	0.06	0.07	0.080	0.110	0.110	0.140	0.140	
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	100	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	100	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	
K	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	100	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	
	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0.06	0.07	0.080	0.110	0.140	0.170	0.220	0.220	0.280	0.280	
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	160	0.050	0.06	0.07	0.1	0.12	0.140	0.190	0.190	0.240	0.240	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220	
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	300	0.050	0.06	0.080	0.1	0.13	0.150	0.200	0.200	0.250	0.250	
S	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	250	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200	
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0.02	0.03	0.03	0.040	0.050	0.06	0.080	0.080	0.1	0.1	

**ATORN® HPC Power end milling cutter 4Z steel**

• Please adjust these guideline values according to clamping operation and machine set-up!

254511....

254510....

ISO	Roughing / Grooving fz for ae = 1.0 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Structural steel	700 - 950	Ck45	1.1191	170	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200
	Cast steel	Up to 950	GS 40	1.0416	110	0.03	0.040	0.050	0.07	0.09	0.1	0.140	0.140	0.170	0.170
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	135	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	90	0.03	0.040	0.040	0.06	0.07	0.080	0.110	0.110	0.140	0.140
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150	0.06	0.07	0.080	0.110	0.140	0.170	0.220	0.220	0.280	0.280
	Alloyed grey cast iron	Up to 310 HB	GG-LNiCr 35 2	0.6678	140	0.050	0.06	0.07	0.1	0.12	0.140	0.190	0.190	0.240	0.240
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220

ISO	Finishing / Edge-banding fz for ae = 0.5 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	230	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Unalloyed structural steel	Up to 700	St-52	1.0052	230	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Structural steel	700 - 950	Ck45	1.1191	200	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200
	Cast steel	Up to 950	GS 40	1.0416	130	0.03	0.040	0.050	0.07	0.09	0.1	0.140	0.140	0.170	0.170
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	160	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	100	0.03	0.040	0.040	0.06	0.07	0.080	0.110	0.110	0.140	0.140
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0.06	0.07	0.080	0.110	0.140	0.170	0.220	0.220	0.280	0.280
	Alloyed grey cast iron	Up to 310 HB	GG-LNiCr 35 2	0.6678	160	0.050	0.06	0.07	0.1	0.12	0.140	0.190	0.190	0.240	0.240
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220

**ATORN® HPC Power end milling cutter 4Z stainless steel**

• Please adjust these guideline values according to clamping operation and machine set-up!

254517....

254516....

ISO	Roughing / Grooving fz for ae = 1.0 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	90	0.03	0.03	0.03	0.050	0.050	0.050	0.080	0.080	0.080	0.080
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.040	0.040	0.040	0.07	0.07	0.07	0.110	0.110	0.110	0.110
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	80	0.040	0.040	0.040	0.07	0.07	0.07	0.110	0.110	0.110	0.110
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	250	0.06	0.06	0.06	0.12	0.12	0.12	0.190	0.190	0.190	0.190
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	210	0.050	0.050	0.050	0.1	0.1	0.1	0.160	0.160	0.160	0.160
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50	0.02	0.02	0.02	0.040	0.040	0.040	0.06	0.06	0.06	0.06
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	25	0.02	0.02	0.02	0.040	0.040	0.040	0.06	0.06	0.06	0.06

ISO	Finishing / Edge-banding fz for ae = 0.5 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	90	0.03	0.03	0.03	0.050	0.050	0.050	0.080	0.080	0.080	0.080
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.040	0.040	0.040	0.07	0.07	0.07	0.110	0.110	0.110	0.110
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	80	0.040	0.040	0.040	0.07	0.07	0.07	0.110	0.110	0.110	0.110
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	250	0.06	0.06	0.06	0.12	0.12	0.12	0.190	0.190	0.190	0.190
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	210	0.050	0.050	0.050	0.1	0.1	0.1	0.160	0.160	0.160	0.160
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50	0.02	0.02	0.02	0.040	0.040	0.040	0.06	0.06	0.06	0.06
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	25	0.02	0.02	0.02	0.040	0.040	0.040	0.06	0.06	0.06	0.06



## SARA® Drilling and plunge milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254144....

254145....

ISO	Ramping Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter range in mm					
						5.7 - 6.0	7.7 - 8.0	9.7 - 10.0	11.7 - 14.0	15.7 - 16	19.7 - 20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	210	0.025	0.038	0.045	0.05	0.07	0.09
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	175	0.025	0.035	0.04	0.045	0.065	0.075
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120	0.02	0.03	0.035	0.04	0.055	0.07
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	110	0.015	0.023	0.034	0.045	0.05	0.055
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	110	0.015	0.023	0.034	0.045	0.05	0.055
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	90	0.015	0.02	0.03	0.035	0.045	0.05
K	Grey cast iron	100 - 400	GG 25	0.6025	150	0.018	0.025	0.038	0.045	0.06	0.075
	Ductile iron	400 - 800	GGG 60	0.7060	110	0.018	0.025	0.038	0.045	0.06	0.075
	Malleable cast iron	350 - 700	GTS 55	0.8155	110	0.018	0.025	0.038	0.045	0.06	0.075
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	70	0.015	0.02	0.03	0.035	0.045	0.05
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	70	0.015	0.02	0.03	0.035	0.045	0.05
	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	50	0.015	0.02	0.035	0.045	0.05	0.055
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	50	0.015	0.02	0.035	0.045	0.05	0.055

## Observe maximum plunge angle!

P	Steel	45°
M	Stainless steel, austenitic	10°
	Stainless steel, sulphurised	10°
	Stainless steel, martensitic	5°
K	Malleable cast iron	45°
S	Nickel-based alloy	5°

ISO	Drilling Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter range in mm					
						5.7 - 6.0	7.7 - 8.0	9.7 - 10.0	11.7 - 14.0	15.7 - 16	19.7 - 20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	210	0.018	0.025	0.03	0.035	0.048	0.06
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	175	0.015	0.023	0.028	0.03	0.043	0.05
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120	0.013	0.02	0.025	0.025	0.038	0.045
K	Grey cast iron	100 - 400	GG 25	0.6025	150	0.013	0.018	0.025	0.03	0.04	0.05
	Ductile iron	400 - 800	GGG 60	0.7060	110	0.013	0.018	0.025	0.03	0.04	0.05
	Malleable cast iron	350 - 700	GTS 55	0.8155	110	0.013	0.018	0.025	0.03	0.04	0.05

ISO	Side milling Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter range in mm					
						5.7 - 6.0	7.7 - 8.0	9.7 - 10.0	11.7 - 14.0	15.7 - 16	19.7 - 20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	210	0.045	0.06	0.07	0.085	0.115	0.14
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	175	0.04	0.055	0.065	0.08	0.1	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120	0.035	0.05	0.06	0.075	0.085	0.1
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	110	0.03	0.04	0.055	0.07	0.075	0.085
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	110	0.03	0.04	0.055	0.07	0.075	0.085
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	90	0.03	0.04	0.05	0.055	0.07	0.08
K	Grey cast iron	100 - 400	GG 25	0.6025	150	0.03	0.045	0.06	0.075	0.09	0.11
	Ductile iron	400 - 800	GGG 60	0.7060	110	0.03	0.045	0.06	0.075	0.09	0.11
	Malleable cast iron	350 - 700	GTS 55	0.8155	110	0.03	0.045	0.06	0.075	0.09	0.11
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	70	0.03	0.04	0.05	0.055	0.07	0.08
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	70	0.03	0.04	0.05	0.055	0.07	0.08
	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	50	0.03	0.04	0.055	0.07	0.075	0.085
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	50	0.03	0.04	0.055	0.07	0.075	0.085

ISO	Groove milling Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter range in mm					
						5.7 - 6.0	7.7 - 8.0	9.7 - 10.0	11.7 - 14.0	15.7 - 16	19.7 - 20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	210	0.035	0.05	0.06	0.07	0.095	0.12
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	175	0.03	0.045	0.055	0.06	0.085	0.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120	0.025	0.04	0.05	0.05	0.075	0.09
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	110	0.02	0.03	0.045	0.06	0.065	0.075
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	110	0.02	0.03	0.045	0.06	0.065	0.075
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	90	0.02	0.03	0.04	0.045	0.06	0.07
K	Grey cast iron	100 - 400	GG 25	0.6025	150	0.025	0.035	0.05	0.06	0.08	0.1
	Ductile iron	400 - 800	GGG 60	0.7060	110	0.025	0.035	0.05	0.06	0.08	0.1
	Malleable cast iron	350 - 700	GTS 55	0.8155	110	0.025	0.035	0.05	0.06	0.08	0.1
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	70	0.02	0.03	0.04	0.045	0.06	0.07
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	70	0.02	0.03	0.04	0.045	0.06	0.07
	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	50	0.02	0.03	0.045	0.06	0.065	0.075
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	50	0.02	0.03	0.045	0.06	0.065	0.075

**VAN HOORN CARBIDE End milling cutter VHVTR Z4**



• Please adjust these guideline values according to clamping operation and machine set-up!

255084....

255087....  
255088....

ISO	Roughing / Grooving ae = 1.0 x D ap = 0.6 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						3	4	5	6	8	10	12	16	20	25
	Materials group														
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80 - 150	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 150	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	60 - 120	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	70 - 100	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30 - 50	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1

ISO	Finishing / Edge-banding ae = 0.5 x D ap = 1 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						3	4	5	6	8	10	12	16	20	25
	Materials group														
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80 - 150	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 150	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	60 - 120	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	70 - 100	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30 - 50	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15

**VAN HOORN CARBIDE End milling cutter VHVTRW Z5**



• Please adjust these guideline values according to clamping operation and machine set-up!

255102 ....

ISO	Finishing / Edge-banding fz for ae = 0.5 x D and ap = 1.0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						3	4	5	6	8	10	12	14	16	20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Unalloyed structural steel	Up to 700	St52	1.0052	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Structural steel	700 - 950	Ck45	1.1191	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Cast steel	Up to 950	GS 40	1.0416	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	130	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125



... extremely sharp.

High-gloss polished...

**ATORN®**  
Performance demands quality



**SARA® ATORN® End milling cutter**

- Please adjust these guideline values according to clamping operation and machine set-up!
- **Cutting data recommendations for extra-long version:** Please reduce the specified data by 25%.

254109....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
						6 - 8	10 - 12	14 - 16	18 - 20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	160	1,180 - 1,230	1.180	1,100 - 1,150	1,040 - 1,080	840
	Unalloyed structural steel	Up to 700	St-52	1.0052	160	1,180 - 1,230	1.180	1,100 - 1,150	1,040 - 1,080	840
	Structural steel	700 - 950	Ck45	1.1191	140	840 - 850	840	830	740 - 810	600
	Cast steel	Up to 950	GS 40	1.0416	140	840 - 850	840	830	740 - 810	600
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	140	840 - 850	840	830	740 - 810	600
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	140	840 - 850	840	830	740 - 810	600
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	70 - 90	250	250	220 - 240	180 - 200	140
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80-100	260	260	230 - 250	190 - 210	150
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	1,420 - 1,470	1.420	1,310 - 1,360	1,240 - 1,310	1.000
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	1,400 - 1,450	1.400	1,290 - 1,340	1,220 - 1,290	980
	Ductile iron	Up to 280 HB	GGG 60	0.7060	190	1,410 - 1,460	1.410	1,300 - 1,350	1,230 - 1,300	990
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	190	1,410 - 1,460	1.410	1,300 - 1,350	1,230 - 1,300	990
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	50 - 60	130 - 140	120 - 130	90 - 100	70 - 80	60
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	30 - 40	70 - 80	60 - 70	40 - 50	38 - 40	30

	ap	ae
Material up to 45 HRc D up to 3 mm D more than 3 mm	1.5 x D 1.5 x D	0.05 x D 0.1 x D
Material from 45-60 HRc	1 x D	0.02 x D

**SARA® Roughing cutter**

- Please adjust these guideline values according to clamping operation and machine set-up!

254090....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						≤ Ø 8	≤ Ø 12	≤ Ø 16	≤ Ø 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	112 - 160	0.04	0.05	0.06	0.07
	Unalloyed structural steel	Up to 700	St-52	1.0052	96 - 160	0.04 - 0.05	0.05	0.06 - 0.07	0.07 - 0.08
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	90 - 143	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.07
	Tempering steel	950 - 1300	43CrMo4	1.3563	83 - 120	0.03	0.04	0.05	0.06
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	83 - 105	0.03	0.04	0.05	0.06
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	91 - 156	0.03 - 0.06	0.04 - 0.07	0.05 - 0.09	0.06 - 0.12
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	104 - 156	0.02 - 0.05	0.03 - 0.05	0.04 - 0.07	0.05 - 0.08
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130 - 156	0.06	0.07	0.09	0.12

**Cutting speed and feed correction factors**

ae	50%	100%
Factor for Vc	1	0.85
Factor for fz	1	0.80

Over 200,000 tools available online!  
Register online now!

[www.saratools.com](http://www.saratools.com)



## SARA® Roughing cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254137.... 254141.... 254142....

ISO	Roughing ap: 1.00 x D1 / ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 4 fz	D1 5 fz	D1 6 fz	D1 8 fz	D1 10 fz	D1 12 fz	D1 14 fz	D1 16 fz	D1 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	159	0.017	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Unalloyed structural steel	Up to 700	St-52	1.0052	145	0.017	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Structural steel	700 - 950	Ck45	1.1191	120	0.017	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Tempering steel	500 - 950	42 CrMo4	1.7225	103	0.013	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Tempering steel	950 - 1300	43CrMo4	1.3563	71	0.013	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	46 - 113	0.013 - 0.017	0.021 - 0.029	0.021 - 0.029	0.027 - 0.038	0.044 - 0.063	0.044 - 0.063	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	67	0.013	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	47	0.013	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120	0.017	0.029	0.029	0.038	0.067	0.067	0.084	0.084	0.101
	Ductile iron	Up to 280 HB	GGG 60	0.7060	71	0.017	0.029	0.029	0.038	0.067	0.067	0.084	0.084	0.101
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	71	0.017	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101

ISO	Finishing / Edge-banding ap: 1.00 x D1 / ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 4 fz	D1 5 fz	D1 6 fz	D1 8 fz	D1 10 fz	D1 12 fz	D1 14 fz	D1 16 fz	D1 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	225	0.02	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Unalloyed structural steel	Up to 700	St-52	1.0052	205	0.02	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Structural steel	700 - 950	Ck45	1.1191	170	0.02	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	145	0.015	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Tempering steel	950 - 1300	43CrMo4	1.3563	100	0.015	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	65 - 160	0.015 - 0.2	0.025 - 0.035	0.025 - 0.035	0.032 - 0.045	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	95	0.015	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	67	0.015	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	170	0.02	0.035	0.035	0.045	0.080	0.080	0.1	0.1	0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100	0.02	0.035	0.035	0.045	0.080	0.080	0.1	0.1	0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100	0.02	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12

## SARA® Torus milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254017....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm	
						6 - 8	10 - 12
P	Machining steel	Up to 700	9 SMn 28	1.0715	85	295 - 315	280
	Unalloyed structural steel	Up to 700	St-52	1.0052	85	295 - 315	280
	Structural steel	700 - 950	Ck45	1.1191	85	295 - 315	280
	Cast steel	Up to 950	GS 40	1.0416	70	235	215 - 230
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	70	235	215 - 230
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70	235	215 - 230
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	45	95	90
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	50	100	95
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	85	295 - 315	280
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	55	125 - 130	110 - 125
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60	130 - 135	115 - 130
H	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	60	130 - 135	115 - 130
	Hardened materials up to 55 HRC		X40Cr14	1.2083	30	50 - 55	40 - 50
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	20	25 - 30	18 - 25

Axial cut depth ap in ISO range	<b>P M K</b>	
		ap 0.5 x D
Axial cut depth ap in ISO range	<b>H</b>	
Hardness 45-50 HRc		ap 0.5 x D
Hardness 50-60 HRc		ap 0.5 x D

# ATORN® Roughing / finishing cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

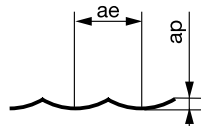
254030...

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						4	5	6	8	10	12	14	16	18	20		
	Materials group																
P	Machining steel	Up to 700	9 SMn 28	1.0715	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Unalloyed structural steel	Up to 700	St-52	1.0052	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Structural steel	700 - 950	Ck45	1.1191	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Tempering steel	500 - 950	42 CrMo4	1.7225	140	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120		
	Cast steel	Up to 950	GS 40	1.0416	140	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120		
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	140	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120		
	Tempering steel	950 - 1300	43CrMo4	1.3563	120	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100		
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	120	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100		
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	120	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100		
	M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	120	0,016	0,020	0,024	0,032	0,040	0,048	0,056	0,064	0,072	0,080	
Stainless steel, austenitic		500 - 950	X5 CrNi 18 10	1.4301	90	0,016	0,020	0,024	0,032	0,040	0,048	0,056	0,064	0,072	0,080		
Duplex		700 - 950	X2 CrNiMoN 22-5-3	1.4462	70	0,012	0,015	0,018	0,024	0,030	0,036	0,042	0,048	0,054	0,060		
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120		
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100	0,016	0,020	0,024	0,032	0,040	0,048	0,056	0,064	0,072	0,080		
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	450	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,162	0,180		
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	450	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,162	0,180		
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	150	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	150	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Thermoplastic		PVC		300	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200		
	Thermoset		Melamin		300	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200		
	S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	80	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100	
Nickel-based alloys		Up to 1300	NiCr19Fe19NbMo	Inconel 718	60	0,016	0,020	0,024	0,032	0,040	0,048	0,056	0,064	0,072	0,080		
Superalloys		Up to 1300	X45CrSi 9 3	1.4718	40	0,012	0,015	0,018	0,024	0,030	0,036	0,042	0,048	0,054	0,060		

ISO	Finishing / Edge-banding fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						4	5	6	8	10	12	14	16	18	20		
	Materials group																
P	Machining steel	Up to 700	9 SMn 28	1.0715	180	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Unalloyed structural steel	Up to 700	St-52	1.0052	180	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Structural steel	700 - 950	Ck45	1.1191	180	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Tempering steel	500 - 950	42 CrMo4	1.7225	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Cast steel	Up to 950	GS 40	1.0416	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
	Tempering steel	950 - 1300	43CrMo4	1.3563	140	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120		
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	140	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120		
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	140	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120		
	M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	120	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120	
Stainless steel, austenitic		500 - 950	X5 CrNi 18 10	1.4301	100	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100		
Duplex		700 - 950	X2 CrNiMoN 22-5-3	1.4462	70	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100		
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	180	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Ductile iron	Up to 280 HB	GGG 60	0.7060	160	0,028	0,035	0,042	0,056	0,070	0,084	0,098	0,112	0,126	0,140		
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	160	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100		
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	550	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200		
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	550	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200		
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	170	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	170	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	170	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	170	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160		
	Thermoplastic		PVC		350	0,060	0,075	0,090	0,120	0,150	0,180	0,210	0,240	0,270	0,300		
	Thermoset		Melamin		350	0,060	0,075	0,090	0,120	0,150	0,180	0,210	0,240	0,270	0,300		
	S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	90	0,024	0,030	0,036	0,048	0,060	0,072	0,084	0,096	0,108	0,120	
Nickel-based alloys		Up to 1300	NiCr19Fe19NbMo	Inconel 718	70	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100		
Superalloys		Up to 1300	X45CrSi 9 3	1.4718	50	0,016	0,020	0,024	0,032	0,040	0,048	0,056	0,064	0,072	0,080		

## ATORN® Mini radius milling cutter RockTec 52

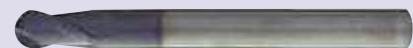
- The lower Vc values apply respectively for long clearances and the smaller diameter range; the higher Vc values for short clearance lengths and the larger diameter range. This also applies for the specified ap max. value.
- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Diameter range ≤ 0.5 mm		Diameter range 0.6 - 1 mm		Diameter range > 1 mm		Feed fz in mm/tooth in relation to milling cutter diameter in mm		
					Vc m/min	ap max.	Vc m/min	ap max.	Vc m/min	ap max.	0.2 - 0.3	0.4-0.8	0.9 - 1.5
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 80	0.007 - 0.03	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 80	0.007 - 0.03	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 80	0.006 - 0.025	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 80	0.006 - 0.025	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
	Ductile iron	Up to 280 HB	GGG 60	0.7060	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	50 - 70	0.006 - 0.025	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.003 - 0.004	0.003 - 0.008	0.004 - 0.01
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	40 - 60	0.005 - 0.02	50 - 70	0.01 - 0.05	60 - 80	0.04 - 0.15	0.003 - 0.004	0.003 - 0.007	0.004 - 0.009
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	30 - 50	0.003 - 0.015	40 - 60	0.008 - 0.05	50 - 70	0.02 - 0.15	0.002 - 0.004	0.002 - 0.005	0.003 - 0.008

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Diameter range ≤ 0.5 mm		Diameter range 0.6 - 1 mm		Diameter range > 1 mm		Feed fz in mm/tooth in relation to milling cutter diameter in mm	
					Vc m/min	ap max.	Vc m/min	ap max.	Vc m/min	ap max.	1.6 - 2	2.5 - 3
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 80	0.007 - 0.03	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 80	0.007 - 0.03	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
	Tempering steel	950 - 1300	43CrMo4	1.3563	60 - 80	0.006 - 0.025	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 80	0.006 - 0.025	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
	Ductile iron	Up to 280 HB	GGG 60	0.7060	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50 - 70	0.007 - 0.03	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.01 - 0.028	0.015 - 0.032
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	50 - 70	0.006 - 0.025	60 - 80	0.01 - 0.05	70 - 90	0.04 - 0.15	0.006 - 0.022	0.013 - 0.029
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	40 - 60	0.005 - 0.02	50 - 70	0.01 - 0.05	60 - 80	0.04 - 0.15	0.006 - 0.016	0.013 - 0.022
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	30 - 50	0.003 - 0.015	40 - 60	0.008 - 0.05	50 - 70	0.02 - 0.15	0.004 - 0.011	0.011 - 0.021

## SARA® Radius milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!
- Cutting data recommendations for extra-long version:** Please reduce the specified data by 25%.

250515....  
254011....

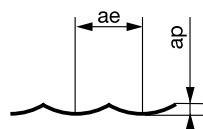
254112....  
254013....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						1 - 2	3 - 4	5 - 6	8 - 10	12 - 14	16 - 18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	168	1.071	1.071	1.197	1.407	1.225	1.141	1.001
	Unalloyed structural steel	Up to 700	St-52	1.0052	168	1.071	1.071	1.197	1.407	1.225	1.141	1.001
	Structural steel	700 - 950	Ck45	1.1191	154	1.071	1.071	1.197	1.407	1.225	1.141	1.001
	Cast steel	Up to 950	GS 40	1.0416	140	854	868	903	1.064	952	868	784
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	140	854	868	903	1.064	952	868	784
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	140	868	882	917	1.078	966	882	798
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	98	392	455	525	616	567	525	462
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	98	399	462	532	623	574	532	469
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	217	1,071 - 1,316	1.316	1.470	1.750	1.505	1.435	1.316
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	189	1,029 - 1,274	1.274	1.428	1.708	1.463	1.393	1.274
	Ductile iron	Up to 280 HB	GGG 60	0.7060	203	1,050 - 1,295	1.295	1.449	1.729	1.484	1.414	1.295
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	203	1,050 - 1,295	1.295	1.449	1.729	1.484	1.414	1.295
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	84	294	336	406	462	427	371	322
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	63	196	224	252	294	273	252	224
	Hardened materials up to 64 HRc		100Cr6	1.2067	56	133	154	168	196	182	168	154

	ap	ae
Material up to 45 HRc	0.1 x D	0.2 x D
Material from 45-60 HRc	0.05 x D	0.1 x D

# ATORN® Radius milling cutter RockTec 52

• Please adjust these guideline values according to clamping operation and machine set-up!

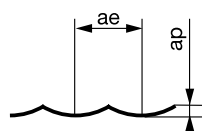


257027....



257035....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae max.	ap max.	Vc m/min		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							Diameter range		2-3	4-5	6-8	10-12	16	20
							2-3	4-20						
P	Machining steel	Up to 700	9 SMn 28	1.0715	0.4 x R	0.1 x R	180-270	270 - 370	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tempering steel	950 - 1300	43CrMo4	1.3563	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	0.4 x R	0.1 x R	180-270	270 - 370	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	150 - 210	210-270	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.4 x R	0.1 x R	120-180	180 - 240	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.11	0.08 - 0.11	0.08 - 0.11

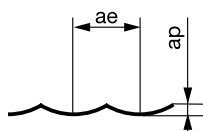


257029....



257037....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae Max.	ap Max.	Vc m/min		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							Diameter range		2-3	4-5	6-8	10-12	16	20
							2-3	4-20						
P	Machining steel	Up to 700	9 SMn 28	1.0715	0.4 x R	0.1 x R	160 - 240	240 - 320	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	0.4 x R	0.1 x R	160 - 220	220 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tempering steel	950 - 1300	43CrMo4	1.3563	0.4 x R	0.1 x R	160 - 220	220 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	160 - 220	220 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	0.4 x R	0.1 x R	160 - 240	240 - 320	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0.4 x R	0.1 x R	160 - 220	220 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0.4 x R	0.1 x R	160 - 220	220 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0.4 x R	0.1 x R	160 - 220	220 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	160 - 220	220 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	160 - 220	220 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	150 - 190	180 - 260	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.4 x R	0.1 x R	110 - 150	140 - 200	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.11	0.08 - 0.11	0.08 - 0.11



257031....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae Max.	ap Max.	Vc m/min		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							Diameter range		2-3	4-5	6-8	10-12	16	20
							2-3	4-20						
P	Machining steel	Up to 700	9 SMn 28	1.0715	0.4 x R	0.1 x R	90 - 170	150 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	0.4 x R	0.1 x R	90 - 150	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tempering steel	950 - 1300	43CrMo4	1.3563	0.4 x R	0.1 x R	90 - 150	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	90 - 150	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	0.4 x R	0.1 x R	90 - 170	150 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0.4 x R	0.1 x R	90 - 150	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0.4 x R	0.1 x R	90 - 150	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0.4 x R	0.1 x R	90 - 150	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	90 - 150	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	90 - 150	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	70 - 130	110 - 160	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.4 x R	0.1 x R	60 - 100	90 - 130	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.11	0.08 - 0.11	0.08 - 0.11

**SARA® Radius milling cutter**

• Please adjust these guideline values according to clamping operation and machine set-up!

254138....

ISO	Finishing / Edge-banding ap: 0.03 x D1 / ae: 0.30 x D1 Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 8 fz	D1 10 fz	D1 12 fz	D1 14 fz	D1 16 fz	D1 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	560	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Unalloyed structural steel	Up to 700	St-52	1.0052	440	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Structural steel	700 - 950	Ck45	1.1191	380	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	370	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Tempering steel	950 - 1300	43CrMo4	1.3563	260	0.007	0.025	0.025	0.032	0.040	0.045	0.045	0.06	0.06	0.080
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	285	0.009	0.03	0.03	0.04	0.045	0.05	0.055	0.075	0.075	0.1
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	560	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	510	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	510	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	140	0.007	0.025	0.025	0.032	0.040	0.045	0.045	0.06	0.06	0.080

**SARA® Slotting cutter**

• Please adjust these guideline values according to clamping operation and machine set-up!

292004....

ISO	Materials group	Tensile strength / Hardness	Cutting speed Vc m/min	Ø 10.5 fz	Ø 13.5 fz	Ø 16.5 fz	Ø 19.5 fz	Ø 22.5 fz	Ø 25.5 fz	Ø 28.5 fz	Ø 32.5 fz	Ø 38.5 fz	Ø 45.5 fz	Ø 20 fz
P	General structural steels	< 500 N/mm <sup>2</sup>	120	0.03	0.03	0.03	0.03	0.035	0.035	0.035	0.038	0.038	0.038	0.057
		> 500-800 N/mm <sup>2</sup>	90	0.03	0.03	0.03	0.03	0.035	0.035	0.035	0.038	0.038	0.038	0.057
	Machining steels	< 850 N/mm <sup>2</sup>	90	0.028	0.028	0.028	0.028	0.033	0.033	0.033	0.036	0.036	0.036	0.066
		< 700 N/mm <sup>2</sup>	120	0.03	0.03	0.03	0.03	0.035	0.035	0.035	0.038	0.038	0.038	0.057
		700-850 N/mm <sup>2</sup>	85	0.028	0.028	0.028	0.028	0.033	0.033	0.033	0.036	0.036	0.036	0.066
	Unalloyed tempered steels	850-1000 N/mm <sup>2</sup>	80	0.028	0.028	0.028	0.028	0.033	0.033	0.033	0.036	0.036	0.036	0.066
Alloyed tempered steels		850-1000 N/mm <sup>2</sup>	70	0.028	0.028	0.028	0.028	0.033	0.033	0.033	0.036	0.036	0.036	0.066
K	Cast iron	< 240 HB	120	0.035	0.035	0.035	0.035	0.04	0.04	0.04	0.045	0.045	0.045	0.073
		< 300 HB	100	0.035	0.035	0.035	0.035	0.04	0.04	0.04	0.045	0.045	0.045	0.073

**SARA® T-slot milling cutter**

• Please adjust these guideline values according to clamping operation and machine set-up!

292005....

ISO	Materials group	Tensile strength / Hardness	Cutting speed Vc m/min	Ø 12.5 fz	Ø 16 fz	Ø 18 fz	Ø 21 fz	Ø 25 fz	Ø 28 fz	Ø 32 fz	Ø 32.5 fz	Ø 38.5 fz	Ø 45.5 fz	Ø 20 fz
P	General structural steels	< 500 N/mm <sup>2</sup>	120	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
		> 500-800 N/mm <sup>2</sup>	90	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
	Machining steels	< 850 N/mm <sup>2</sup>	90	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
		< 700 N/mm <sup>2</sup>	120	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
		700-850 N/mm <sup>2</sup>	85	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
	Unalloyed tempered steels	850-1000 N/mm <sup>2</sup>	80	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
Alloyed tempered steels		850-1000 N/mm <sup>2</sup>	70	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
K	Cast iron	< 240 HB	120	0.035	0.035	0.035	0.04	0.04	0.04	0.05	0.045	0.045	0.045	0.073
		< 300 HB	100	0.035	0.035	0.035	0.04	0.04	0.04	0.05	0.045	0.045	0.045	0.073



292006....

ISO	Materials group	Tensile strength / Hardness	Cutting speed Vc m/min	Ø 12.5 fz	Ø 16 fz	Ø 18 fz	Ø 21 fz	Ø 25 fz	Ø 28 fz	Ø 32 fz	Ø 32.5 fz	Ø 38.5 fz	Ø 45.5 fz	Ø 20 fz
P	General structural steels	< 500 N/mm <sup>2</sup>	120	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
		> 500-800 N/mm <sup>2</sup>	90	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
	Machining steels	< 850 N/mm <sup>2</sup>	90	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
		< 700 N/mm <sup>2</sup>	120	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
		700-850 N/mm <sup>2</sup>	85	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
	Unalloyed tempered steels	850-1000 N/mm <sup>2</sup>	80	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
Alloyed tempered steels		850-1000 N/mm <sup>2</sup>	70	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
K	Cast iron	< 240 HB	120	0.035	0.035	0.035	0.04	0.04	0.04	0.05	0.045	0.045	0.045	0.073
		< 300 HB	100	0.035	0.035	0.035	0.04	0.04	0.04	0.05	0.045	0.045	0.045	0.073



## SARA® Radius milling cutter 220°



• Please adjust these guideline values according to clamping operation and machine set-up!

250510....

ISO	Roughing / Grooving fz for ae = 0,3 x D and ap = 0,03 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						1	2	3	5	6	8	10	12	16		
	Materials group															
P	Machining steel	Up to 700	9 SMn 28	1.0715	450	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090		
	Unalloyed structural steel	Up to 700	St-52	1.0052	350	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090		
	Structural steel	700 - 950	Ck45	1.1191	450	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090		
	Tempering steel	500 - 950	42 CrMo4	1.7225	310	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090		
	Cast steel	Up to 950	GS 40	1.0416	310	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090		
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	250	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090		
	Tempering steel	950 - 1300	43CrMo4	1.3563	250	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090		
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	250	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090		
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	170	0,005	0,007	0,007	0,025	0,032	0,040	0,045	0,045	0,055		
	K	Grey cast iron	Up to 260 HB	GG 25	0.6025	450	0,007	0,007	0,007	0,025	0,045	0,055	0,065	0,065	0,090	
Alloyed grey cast iron		Up to 310 HB	GGL-NiCr 35 2	0.6678	410	0,007	0,007	0,007	0,025	0,045	0,055	0,065	0,065	0,090		
Ductile iron		Up to 280 HB	GGG 60	0.7060	430	0,007	0,007	0,007	0,025	0,045	0,055	0,065	0,065	0,090		
Malleable cast iron		Up to 280 HB	GTS 55	0.8155	430	0,007	0,007	0,007	0,025	0,045	0,055	0,065	0,065	0,090		
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	120	0,005	0,011	0,011	0,035	0,032	0,040	0,045	0,045	0,055		
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	90	0,005	0,011	0,011	0,035	0,032	0,040	0,045	0,045	0,055		
	Hardened materials up to 64 HRC		100Cr6	1.2067	70	0,005	0,011	0,011	0,035	0,032	0,040	0,045	0,045	0,055		



## ATORN® Single-blade end milling cutter Ultra-N



249100....

- Cooling = emulsion
- The specified values apply to ae < 0.5 x D and ap 1 x D.

Correction example:

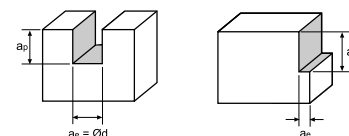
Correction factor fz for full slot (ae > 0.5 x D) = 0.7

Correction factor fz for ap < 1 x D = 1.2

- Please adjust these guideline values according to clamping operation and machine set-up!



250001....  
249700....

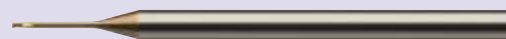


ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							0.6-1.5	2	3	4	5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
	Thermoplastic		PVC		350 - 500	420	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
	Thermoset		Melamine		250 - 400	320	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
	Thermoplastic		PVC		350 - 500	420	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
	Thermoset		Melamine		250 - 400	320	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18



## ATORN® Mini end milling cutter Ultra-N



- Cooling = emulsion
- The specified values apply to  $a_e < 0.5 \times D$ .

249001....

249002....

**Correction example:**

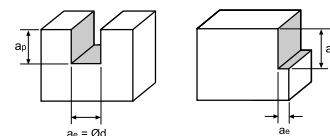
Correction factor fz for projecting length ( $5-10 \times D$ ) = 0.7

Correction factor fz for projecting length ( $> 10 \times D$ ) = 0.5

Correction factor fz for full slot ( $a_e > 0.5 \times D$ ) = 0.7

Correction factor fz for copying = 1.3

- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm		ap min/max in mm/tooth in relation to milling cutter diameter in mm	
							0.5	1	0.5	1
							N	Al. alloy long-chipping	Up to 500	AlMg 3
Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.009 - 0.015		0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.009 - 0.015		0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.009 - 0.015		0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.009 - 0.015		0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	330	0.009 - 0.015		0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
Thermoplastic		PVC		400 - 550	450	0.009 - 0.015		0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
Thermoset		Melamine		300 - 450	360	0.009 - 0.015		0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.009 - 0.015		0.016 - 0.025	0.02 - 0.3	0.05 - 0.7

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm		ap min/max in mm/tooth in relation to milling cutter diameter in mm	
							1.5	2	1.5	2
							N	Al. alloy long-chipping	Up to 500	AlMg 3
Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.03 - 0.035		0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.03 - 0.035		0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.03 - 0.035		0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.03 - 0.035		0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	330	0.03 - 0.035		0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
Thermoplastic		PVC		400 - 550	450	0.03 - 0.035		0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
Thermoset		Melamine		300 - 450	360	0.03 - 0.035		0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.03 - 0.035		0.035 - 0.05	0.07 - 1.2	0.1 - 1.5

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm		ap min/max in mm/tooth in relation to milling cutter diameter in mm	
							2.5	2.5	2.5	2.5
							N	Al. alloy long-chipping	Up to 500	AlMg 3
Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.04 - 0.06		0.04 - 0.06	0.12 - 2	0.12 - 2
Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.04 - 0.06		0.04 - 0.06	0.12 - 2	0.12 - 2
Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.04 - 0.06		0.04 - 0.06	0.12 - 2	0.12 - 2
Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.04 - 0.06		0.04 - 0.06	0.12 - 2	0.12 - 2
Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	330	0.04 - 0.06		0.04 - 0.06	0.12 - 2	0.12 - 2
Thermoplastic		PVC		400 - 550	450	0.04 - 0.06		0.04 - 0.06	0.12 - 2	0.12 - 2
Thermoset		Melamine		300 - 450	360	0.04 - 0.06		0.04 - 0.06	0.12 - 2	0.12 - 2
Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.04 - 0.06		0.04 - 0.06	0.12 - 2	0.12 - 2

## ATORN® Radius milling cutter Ultra-MS



- Please adjust these guideline values according to clamping operation and machine set-up!

256016....

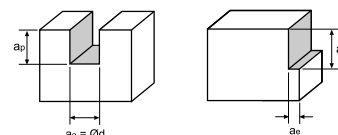
ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc m/min $\phi \leq 0.5$ mm	$\phi 3 - 4$ fz	$\phi 5 - 6$ fz	$\phi 8 - 10$ fz	$\phi 12 - 16$ fz	$\phi 16 - 20$ fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
	Unalloyed structural steel	Up to 700	St52	1.0052	140 - 160	0.022 - 0.033	0.034 - 0.042	0.043 - 0.057	0.062 - 0.083	0.073 - 0.12
	Structural steel	700 - 950	Ck45	1.1191	140 - 160	0.022 - 0.033	0.034 - 0.042	0.043 - 0.057	0.062 - 0.083	0.073 - 0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
	Cast steel	Up to 950	GS 40	1.0416	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	65 - 85	0.016 - 0.025	0.026 - 0.035	0.038 - 0.05	0.052 - 0.073	0.063 - 0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	60 - 80	0.014 - 0.022	0.024 - 0.032	0.036 - 0.048	0.051 - 0.071	0.065 - 0.087
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12

## ATORN® Longitudinal slot milling cutter Ultra-N



- Cooling = emulsion
- The specified values apply to  $a_e < 0.5 \times D$  and  $a_p 1 \times D$ .

249200.... 249202....  
249201.... 249207....



**Correction example:**

Correction factor  $f_z$  for full slot ( $a_e > 0.5 \times D$ ) = 0.7

Correction factor  $f_z$  for  $a_p < 1 \times D$  = 1.2

Uncoated tools:

please reduced  $V_c$  values by 10%!  $f_z$  values remain the same.

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm				
							3	4	5	6	8
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Thermoplastic		PVC		350 - 500	420	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Thermoset		Melamine		250 - 400	320	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm			
							10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Thermoplastic		PVC		350 - 500	420	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Thermoset		Melamine		250 - 400	320	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15

## VAN HOORN CARBIDE End milling cutter VHLOW / VHRAW

- Please adjust these guideline values according to clamping operation and machine set-up!



255168....



255169....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						Roughing			Finishing		
						8	12	16	8	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	500	0.1	0.2	0.3	0.6	0.8	0.12
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	280	0.1	0.2	0.3	0.6	0.8	0.12
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	280	0.1	0.2	0.3	0.5	0.7	0.1
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	300	0.1	0.2	0.3	0.5	0.7	0.1
	Thermoplastic		PVC		300	0.1	0.2	0.3	0.5	0.1	0.14
	Thermoset		Melamine		300	0.1	0.2	0.3	0.5	0.1	0.14

**Feed correction f2 = 1**

Roughing  $a_e = 0.1 \times D$   $a_p = \max. L1$   
Finishing  $a_e = 0.1 \times D$   $a_p = \max. L1$

**Feed correction f2 = 0.6**

Roughing  $a_e = 0.1 \times D$   $a_p = \max. L1$   
Finishing  $a_e = 0.3 \times D$   $a_p = \max. L1$

**Feed correction**

1 x D bore depth and then longitudinal slot milling  $f2 = 0.3$  Drilling  $f2 = 0.5$  Milling

$a_e$  = radial cutting depth  
 $a_p$  = axial cutting depth  
 $D$  = milling cutter diameter  
 $L1$  = cutting edge length

The respective feed rate is calculated as follows:  
 $V_f = f_z \times z \times n \times f2$

## ATORN® End milling cutter Ultra-N



• The specified values apply to  $a_e < 0.5 \times D$  and  $a_p 1 \times D$ .

Cooling = emulsion

249300.... 249305.... 249351....  
 249301.... 249307.... 249352....  
 249302.... 249308.... 249355....  
 249303.... 249309....  
 249304.... 249350....

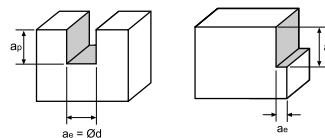
### Correction examples:

Correction factor  $f_z$  for full slot ( $a_e > 0.5 \times D$ ) = 0.7

Correction factor  $f_z$  for  $a_p < 1 \times D$  = 1.2

**Long version:** please correct  $f_z$  values by factor 0.8

**Uncoated tools:** please reduce  $V_c$  values by 10%!  $f_z$  values remain the same.



• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							3	4	5	6	8
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Thermoplastic		PVC		350 - 500	420	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Thermoset		Melamine		250 - 400	320	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Thermoplastic		PVC		350 - 500	420	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Thermoset		Melamine		250 - 400	320	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15

## ATORN® End milling cutter Ultra-N



• The specified values apply to  $a_e < 0.5 \times D$  and  $a_p 1 \times D$ .

Cooling = emulsion

249400.... 249450....  
 249401.... 249460....

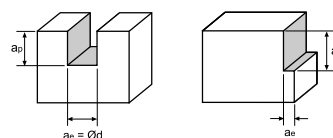
### Correction examples:

Correction factor  $f_z$  for full slot ( $a_e > 0.5 \times D$ ) = 0.7

Correction factor  $f_z$  for  $a_p < 1 \times D$  = 1.2

**Long version:** please correct  $f_z$  values by factor 0.9

**Extra-long version:** please correct  $f_z$  values by factor 0.8



• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							3	4	5	6	8
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Thermoplastic		PVC		350 - 500	420	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Thermoset		Melamine		250 - 400	320	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Thermoplastic		PVC		350 - 500	420	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Thermoset		Melamine		250 - 400	320	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22

**ATORN® End milling cutter Ultra N**

• Please adjust these guideline values according to clamping operation and machine set-up!

249601 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	600	0,025	0,030	0,040	0,050	0,070	0,085	0,150
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	450	0,020	0,025	0,030	0,046	0,060	0,080	0,120
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	150	0,015	0,020	0,025	0,030	0,050	0,060	0,080
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150	0,015	0,020	0,025	0,030	0,050	0,060	0,080
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	120	0,015	0,020	0,025	0,030	0,050	0,060	0,080
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	120	0,015	0,020	0,025	0,030	0,050	0,060	0,080
	Thermoplastic		PVC		300	0,020	0,025	0,035	0,045	0,060	0,080	0,100

ISO	Finishing / Edge-banding fz for ae = 0,3 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	1000	0,044	0,055	0,066	0,088	0,110	0,132	0,176
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	750	0,040	0,050	0,060	0,080	0,100	0,120	0,160
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	240	0,028	0,350	0,040	0,480	0,060	0,072	0,100
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	240	0,028	0,350	0,040	0,480	0,060	0,072	0,100
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	220	0,022	0,030	0,035	0,040	0,050	0,065	0,080
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	220	0,022	0,030	0,035	0,040	0,050	0,065	0,080
	Thermoplastic		PVC		350	0,025	0,035	0,040	0,050	0,065	0,085	0,120

**ATORN® Roughing cutter Ultra N**

• Please adjust these guideline values according to clamping operation and machine set-up!

249603 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	650	0,050	0,070	0,090	0,120	0,141	0,180
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	480	0,032	0,048	0,065	0,083	0,128	0,154
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	150	0,030	0,040	0,055	0,060	0,080	0,100
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150	0,030	0,040	0,055	0,060	0,080	0,100
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	120	0,025	0,035	0,040	0,050	0,065	0,080
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	120	0,025	0,035	0,040	0,050	0,065	0,080
	Thermoplastic		PVC		300	0,035	0,045	0,060	0,080	0,100	0,120

ISO	Finishing / Edge-banding fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	950	0,066	0,088	0,110	0,132	0,176	0,220
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	635	0,060	0,080	0,100	0,120	0,160	0,200
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200	0,040	0,480	0,060	0,072	0,100	0,120
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	200	0,040	0,480	0,060	0,072	0,100	0,120
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	170	0,035	0,040	0,050	0,065	0,080	0,100
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	170	0,035	0,040	0,050	0,065	0,080	0,100
	Thermoplastic		PVC		380	0,040	0,050	0,065	0,085	0,120	0,178

**ATORN® End milling cutter Ultra N**

• Please adjust these guideline values according to clamping operation and machine set-up!

249605 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
						6	8	10	12	14	16	18	20	
	Materials group													
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	650	0,040	0,050	0,070	0,085	0,112	0,150	0,160	0,180	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	450	0,030	0,046	0,060	0,080	0,098	0,120	0,130	0,145	
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	180	0,025	0,030	0,050	0,060	0,070	0,080	0,095	0,120	
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180	0,025	0,030	0,050	0,060	0,070	0,080	0,095	0,120	
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	150	0,025	0,030	0,050	0,060	0,070	0,080	0,095	0,120	
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150	0,025	0,030	0,050	0,060	0,070	0,080	0,095	0,120	
	Thermoplastic		PVC		300	0,035	0,045	0,060	0,080	0,090	0,100	0,120	0,130	

ISO	Finishing / Edge-banding fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						6	8	10	12	14	16	18	20
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	1000	0,066	0,088	0,110	0,132	0,150	0,176	0,198	0,220
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	750	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	240	0,040	0,480	0,060	0,072	0,085	0,100	0,120	0,150
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	240	0,040	0,480	0,060	0,072	0,085	0,100	0,120	0,150
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	220	0,035	0,040	0,050	0,065	0,070	0,080	0,100	0,120
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	220	0,035	0,040	0,050	0,065	0,070	0,080	0,100	0,120
	Thermoplastic		PVC		350	0,040	0,050	0,065	0,085	0,100	0,120	0,135	0,150

**ATORN® End milling cutter Ultra N**

• Please adjust these guideline values according to clamping operation and machine set-up!

249607 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						6	8	10	12	14	16	18	20
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	650	0,050	0,070	0,090	0,120	0,130	0,141	0,160	0,180
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	480	0,032	0,048	0,065	0,083	0,100	0,128	0,140	0,154
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	150	0,030	0,040	0,055	0,060	0,070	0,080	0,090	0,100
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150	0,030	0,040	0,055	0,060	0,070	0,080	0,090	0,100
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	120	0,025	0,035	0,040	0,050	0,060	0,065	0,070	0,080
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	120	0,025	0,035	0,040	0,050	0,060	0,065	0,070	0,080
	Thermoplastic		PVC		300	0,035	0,045	0,060	0,080	0,090	0,100	0,110	0,120
	Thermoset		Melamine		250	0,020	0,025	0,035	0,040	0,050	0,065	0,080	0,100

ISO	Finishing / Edge-banding fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						6	8	10	12	14	16	18	20
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	1000	0,066	0,088	0,110	0,132	0,150	0,176	0,200	0,220
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	635	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200	0,040	0,480	0,060	0,072	0,085	0,100	0,110	0,120
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	200	0,040	0,480	0,060	0,072	0,085	0,100	0,110	0,120
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	170	0,035	0,040	0,050	0,065	0,070	0,080	0,090	0,100
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	170	0,035	0,040	0,050	0,065	0,070	0,080	0,090	0,100
	Thermoplastic		PVC		380	0,040	0,050	0,065	0,085	0,100	0,120	0,150	0,178
	Thermoset		Melamine		300	0,030	0,040	0,050	0,060	0,070	0,080	0,100	0,120

## ATORN® Torus milling cutter Ultra N



• Please adjust these guideline values according to clamping operation and machine set-up!

249609 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						10	12	14	16	18	20
	Materials group										
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	650	0,070	0,085	0,112	0,150	0,160	0,180
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	450	0,060	0,080	0,098	0,120	0,130	0,145
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	180	0,050	0,060	0,070	0,080	0,095	0,120
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180	0,050	0,060	0,070	0,080	0,095	0,120
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	150	0,050	0,060	0,070	0,080	0,095	0,120
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150	0,050	0,060	0,070	0,080	0,095	0,120
	Thermoplastic		PVC		300	0,060	0,080	0,090	0,100	0,120	0,130

ISO	Finishing / Edge-banding fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						10	12	14	16	18	20
	Materials group										
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	650	0,110	0,132	0,150	0,176	0,198	0,220
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	450	0,100	0,120	0,140	0,160	0,180	0,200
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	180	0,060	0,072	0,085	0,100	0,120	0,150
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180	0,060	0,072	0,085	0,100	0,120	0,150
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	150	0,050	0,065	0,070	0,080	0,100	0,120
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150	0,050	0,065	0,070	0,080	0,100	0,120
	Thermoplastic		PVC		300	0,065	0,085	0,100	0,120	0,135	0,150

## ATORN® Torus milling cutter Ultra N



• Please adjust these guideline values according to clamping operation and machine set-up!

249611 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						6	8	10	12	14	16	18	20
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	650	0,090	0,120	0,130	0,141	0,160	0,180	0,160	0,180
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	480	0,065	0,083	0,100	0,128	0,140	0,154	0,140	0,154
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	150	0,055	0,060	0,070	0,080	0,090	0,100	0,090	0,100
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150	0,055	0,060	0,070	0,080	0,090	0,100	0,090	0,100
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	120	0,040	0,050	0,060	0,065	0,070	0,080	0,070	0,080
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	120	0,040	0,050	0,060	0,065	0,070	0,080	0,070	0,080
	Thermoplastic		PVC		300	0,060	0,080	0,090	0,100	0,110	0,120	0,110	0,120
Duroplast		Melamin		250	0,035	0,040	0,050	0,065	0,080	0,100	0,080	0,100	

ISO	Finishing / Edge-banding fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						6	8	10	12	14	16	18	20
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	1000	0,110	0,132	0,150	0,176	0,200	0,220	0,200	0,220
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	635	0,100	0,120	0,140	0,160	0,180	0,200	0,180	0,200
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200	0,060	0,072	0,085	0,100	0,110	0,120	0,110	0,120
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	200	0,060	0,072	0,085	0,100	0,110	0,120	0,110	0,120
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	170	0,050	0,065	0,070	0,080	0,090	0,100	0,090	0,100
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	170	0,050	0,065	0,070	0,080	0,090	0,100	0,090	0,100
	Thermoplastic		PVC		380	0,065	0,085	0,100	0,120	0,150	0,178	0,150	0,178
Duroplast		Melamin		300	0,050	0,060	0,070	0,080	0,100	0,120	0,100	0,120	



# ATORN® End milling cutter Ultra-N



- The specified values apply to  $a_e < 0.5 \times D$  and  $a_p 1 \times D$ .

Cooling = emulsion

249480....

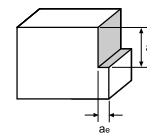
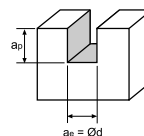
249490....

**Correction examples:**

Correction factor  $f_z$  for full slot ( $a_e > 0.5 \times D$ ) = 0.7

Correction factor  $f_z$  for  $a_p < 1 \times D$  = 1.2

**Long version:** please correct  $f_z$  values by factor 0.9



- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							3	4	5	6	8
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Thermoplastic		PVC		350 - 500	420	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Thermoset		Melamine		250 - 400	320	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Thermoplastic		PVC		350 - 500	420	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Thermoset		Melamine		250 - 400	320	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22



... highly economical.

Tangential is...

**ATORN®**  
Performance demands quality



## ATORN® Roughing cutter Ultra-N



• The specified values apply to  $a_e < 0.5 \times D$  and  $a_p 1 \times D$ .

Cooling = emulsion

249370....

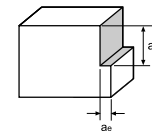
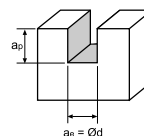
249371....  
249372....

### Correction examples:

Correction factor  $f_z$  for full slot ( $a_e > 0.5 \times D$ ) = 0.7

Correction factor  $f_z$  for  $a_p < 1 \times D$  = 1.2

• Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	200 - 350	250	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Thermoplastic		PVC		350 - 500	420	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Thermoset		Melamine		250 - 400	320	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25

## ATORN® Torus milling cutter Ultra-N



• The specified values apply to  $a_e < 0.5 \times D$  and  $a_p 0.2 \times D$ .

Cooling = emulsion

249211....

249212....  
249213....

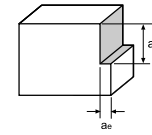
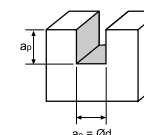
### Correction examples:

Correction factor  $f_z$  for full slot ( $a_e > 0.5 \times D$ ) = 0.7

Long version: please correct  $f_z$  values by factor 0.9

Extra-long version: please correct  $f_z$  values by factor 0.8

• Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
							3	4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	375 - 550	425	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	175 - 275	200	0.02 - 0.04	0.025 - 0.04	0.03 - 0.045	0.035 - 0.05	0.05 - 0.07	0.06 - 0.09	0.07 - 0.1	0.08 - 0.14
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	225 - 375	275								
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	175 - 275	200								
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	225 - 375	275								
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	175 - 275	200								
	Thermoplastic		PVC		375 - 550	450								
	Thermoset		Melamine		275 - 450	350								
	Fibre-reinforced plastics		CFRP, GFRP		225 - 375	275								

## ATORN® Torus milling cutter Ultra-N



• The specified values apply to  $a_e < 0.5 \times D$  and  $a_p 1 \times D$ .

Cooling = emulsion

249311....

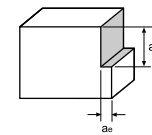
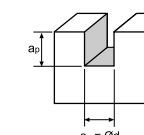
249312....

### Correction examples:

Correction factor  $f_z$  for full slot ( $a_e > 0.5 \times D$ ) = 0.7

Correction factor  $f_z$  for  $a_p < 1 \times D$  = 1.2

• Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
							5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	375 - 550	425	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	175 - 275	200	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	225 - 375	275	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	175 - 275	200	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	225 - 375	275	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	175 - 275	200	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Thermoplastic		PVC		375 - 550	450	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Thermoset		Melamine		275 - 450	350	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Fibre-reinforced plastics		CFRP, GFRP		225 - 375	275	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15

## ATORN® Mini radius milling cutter Ultra-N



• The specified values apply to  $ae < 0.5 \times D$ .

Cooling = emulsion

249003....

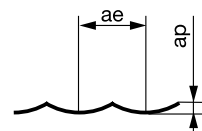
### Correction examples:

Correction factor  $f_z$  for projecting length ( $5-10 \times D = 0.7$ )

Correction factor  $f_z$  for projecting length ( $> 10 \times D$ ) = 0.5

Correction factor  $f_z$  for full slot ( $ae > 0.5 \times D$ ) = 0.7

Correction factor  $f_z$  for copying = 1.3



• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		ap in mm in relation to the milling cutter diameter in mm	
							0.5	1	0.5	1
							N	Al. alloy long-chipping	Up to 500	AlMg 3
Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.01 - 0.017		0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.01 - 0.017		0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.01 - 0.017		0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.01 - 0.017		0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	230	0.01 - 0.017		0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
Thermoplastic		PVC		400 - 550	450	0.01 - 0.017		0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
Thermoset		Melamine		300 - 450	360	0.01 - 0.017		0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.01 - 0.017		0.02 - 0.03	0.025 - 0.25	0.1 - 0.5

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		ap in mm in relation to the milling cutter diameter in mm	
							1.5	2	1.5	2
							N	Al. alloy long-chipping	Up to 500	AlMg 3
Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.03 - 0.045		0.035 - 0.06	0.15-0.75	0.12 - 1
Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.03 - 0.045		0.035 - 0.06	0.15-0.75	0.12 - 1
Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.03 - 0.045		0.035 - 0.06	0.15-0.75	0.12 - 1
Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.03 - 0.045		0.035 - 0.06	0.15-0.75	0.12 - 1
Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	230	0.03 - 0.045		0.035 - 0.06	0.15-0.75	0.12 - 1
Thermoplastic		PVC		400 - 550	450	0.03 - 0.045		0.035 - 0.06	0.15-0.75	0.12 - 1
Thermoset		Melamine		300 - 450	360	0.03 - 0.045		0.035 - 0.06	0.15-0.75	0.12 - 1
Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.03 - 0.045		0.035 - 0.06	0.15-0.75	0.12 - 1

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		ap in mm in relation to the milling cutter diameter in mm	
							2.5		2.5	
							N	Al. alloy long-chipping	Up to 500	AlMg 3
Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.045 - 0.07		0.25 - 1.25		
Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.045 - 0.07		0.25 - 1.25		
Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.045 - 0.07		0.25 - 1.25		
Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.045 - 0.07		0.25 - 1.25		
Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	230	0.045 - 0.07		0.25 - 1.25		
Thermoplastic		PVC		400 - 550	450	0.045 - 0.07		0.25 - 1.25		
Thermoset		Melamine		300 - 450	360	0.045 - 0.07		0.25 - 1.25		
Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.045 - 0.07		0.25 - 1.25		

## ATORN® Radius milling cutter Ultra-N



• The specified values apply to  $ae < 0.5 \times D$  and  $ap 0.2 \times D$ .

Cooling = emulsion

249240....

249250....

249260....

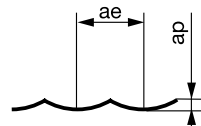
### Correction examples:

Correction factor  $f_z$  for full slot ( $ae > 0.5 \times D$ ) = 0.7

Correction factor  $f_z$  for  $ap < 1 \times D$  = 1.2

**Long version:** please correct  $f_z$  values by factor 0.9

**Extra-long version:** please correct  $f_z$  values by factor 0.8



• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
							3	4	5	6	8	10	12	16
							N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400 - 550	450	0.02 - 0.04
Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220									
Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320									
Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220									
Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320									
Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	330									
Thermoplastic		PVC		400 - 550	450									
Thermoset		Melamine		300 - 450	360									
Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320									

## ATORN® Single-blade milling cutter Ultra-N PRO



Please adjust these guideline values according to clamping operation and machine set-up!

249005 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						1	1,5	2	3	4	5	6	8	10	12		
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	450	0,004	0,004	0,007	0,007	0,015	0,015	0,025	0,034	0,042	0,050		
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	400	0,004	0,004	0,007	0,007	0,015	0,015	0,025	0,034	0,042	0,050		
	Thermoplastic		PVC		220	0,004	0,004	0,007	0,007	0,015	0,015	0,025	0,034	0,042	0,050		
	Fibre-reinforced plastics		CFRP, GFRP		110	0,004	0,004	0,007	0,007	0,015	0,015	0,025	0,034	0,042	0,050		

## ATORN® Drill groove milling cutter Ultra-N PRO



Please adjust these guideline values according to clamping operation and machine set-up!

249006 ....

249007....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						3	4	5	6	8	10	12	16	20			
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	450	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090			
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	400	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090			
	Thermoplastic		PVC		220	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090			
	Fibre-reinforced plastics		CFRP, GFRP		110	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090			

ISO	Finishing / Edge-banding fz for ae = 0,3 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						3	4	5	6	8	10	12	16	20			
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	800	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120			
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	730	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120			
	Thermoplastic		PVC		400	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120			
	Fibre-reinforced plastics		CFRP, GFRP		200	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120			

## ATORN® End milling cutter Ultra-N PRO



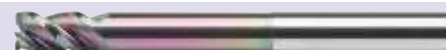
Please adjust these guideline values according to clamping operation and machine set-up!

249008 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						4	5	6	8	10	12	16	20				
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090				
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	280	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090				
	Thermoplastic		PVC		150	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090				
	Fibre-reinforced plastics		CFRP, GFRP		80	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090				

ISO	Finishing / Edge-banding fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						4	5	6	8	10	12	16	20				
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	480	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120				
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	440	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120				
	Thermoplastic		PVC		240	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120				
	Fibre-reinforced plastics		CFRP, GFRP		120	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120				

## ATORN® End milling cutter Ultra-N PRO



Please adjust these guideline values according to clamping operation and machine set-up!

249009 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						4	5	6	8	10	12	16	20				
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300	0,022	0,031	0,041	0,055	0,074	0,090	0,100	0,120				
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	280	0,022	0,031	0,041	0,055	0,074	0,090	0,100	0,120				
	Thermoplastic		PVC		150	0,022	0,031	0,041	0,055	0,074	0,090	0,100	0,120				
	Fibre-reinforced plastics		CFRP, GFRP		80	0,022	0,031	0,041	0,055	0,074	0,090	0,100	0,120				

ISO	Finishing / Edge-banding fz for ae = 0,3 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						4	5	6	8	10	12	16	20				
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	480	0,030	0,042	0,055	0,075	0,100	0,120	0,100	0,120				
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	440	0,030	0,042	0,055	0,075	0,100	0,120	0,100	0,120				
	Thermoplastic		PVC		240	0,030	0,042	0,055	0,075	0,100	0,120	0,100	0,120				
	Fibre-reinforced plastics		CFRP, GFRP		120	0,030	0,042	0,055	0,075	0,100	0,120	0,100	0,120				

**ATORN® End milling cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249010 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						3	4	5	6	8	10	12	14	16	18	20	
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	450	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,055	0,074	0,074	0,090	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	400	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,055	0,074	0,074	0,090	
	Thermoplastic		PVC		220	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,055	0,074	0,074	0,090	
	Fibre-reinforced plastics		CFRP, GFRP		110	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,055	0,074	0,074	0,090	

ISO	Finishing / Edge-banding fz for ae = 0,3 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						3	4	5	6	8	10	12	14	16	18	20	
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	800	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,075	0,100	0,100	0,120	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	730	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,075	0,100	0,100	0,120	
	Thermoplastic		PVC		400	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,075	0,100	0,100	0,120	
	Fibre-reinforced plastics		CFRP, GFRP		200	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,075	0,100	0,100	0,120	

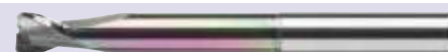
**ATORN® End milling cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249011 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						3	4	5	6	8	10	12	16	20			
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	360	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130			
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	380	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130			
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130			
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	180	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130			
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	240	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130			

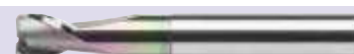
ISO	Finishing / Edge-banding fz for ae = 0,5 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm											
						3	4	5	6	8	10	12	16	20			
	Materials group																
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	500	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160			
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	520	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160			
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	200	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160			
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	230	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160			
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	320	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160			

**ATORN® Torus milling cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249012 ....

ISO	copy / Finishing fz for ae = 0,5 x D and ap = 0,05 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						3	4	5	6	8	10	12	16
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	220	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Thermoplastic		PVC		160	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Fibre-reinforced plastics		CFRP, GFRP		120	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090

**ATORN® Torus milling cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249013 ....

ISO	copy / Finishing fz for ae = 0,5 x D and ap = 0,05 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						3	4	5	6	8	10	12	16
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	320	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	280	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Thermoplastic		PVC		240	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Fibre-reinforced plastics		CFRP, GFRP		160	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090

**ATORN® Torus milling cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249014 ....

ISO	Trochoidal / Roughing fz for ae = 0,12 x D and ap = 3,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						6	8	10	12	16	20	
	Materials group											
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	280	0,050	0,065	0,080	0,120	0,150	0,200	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	260	0,050	0,065	0,080	0,120	0,150	0,200	
	Thermoplastic		PVC		160	0,050	0,065	0,080	0,120	0,150	0,200	
	Fibre-reinforced plastics		CFRP, GFRP		120	0,050	0,065	0,080	0,120	0,150	0,200	

**ATORN® Trochoidal end milling cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249019....

ISO	Trochoidal / Roughing fz for ae = 0,12 x D and ap = 3,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						6	8	10	12	16	20	
	Materials group											
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	280	0,050	0,065	0,080	0,120	0,150	0,200	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	470	0,050	0,065	0,080	0,120	0,150	0,200	
	Thermoplastic		PVC		385	0,050	0,065	0,080	0,120	0,150	0,200	
	Fibre-reinforced plastics		CFRP, GFRP		280	0,050	0,065	0,080	0,120	0,150	0,200	

**ATORN® Radius milling cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249015 ....

ISO	copy / Finishing fz for ap = 0,03 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						3	4	5	6	8	10	12	16
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	800	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	600	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150
	Thermoplastic		PVC		500	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150

**ATORN® Radius milling cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249016 ....

ISO	copy / Finishing fz for ap = 0,03 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						3	4	5	6	8	10	12	16
	Materials group												
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	700	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	550	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150
	Thermoplastic		PVC		450	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150

**ATORN® Roughing cutter Ultra-N PRO**

• Please adjust these guideline values according to clamping operation and machine set-up!

249017 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						6	8	10	12	16	20	
	Materials group											
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	370	0,060	0,080	0,110	0,130	0,160	0,200	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	350	0,060	0,080	0,110	0,130	0,160	0,200	
	Thermoplastic		PVC		210	0,030	0,035	0,040	0,045	0,055	0,080	
	Materials group											
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	520	0,080	0,100	0,130	0,150	0,200	0,250	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	490	0,080	0,100	0,130	0,150	0,200	0,250	
	Thermoplastic		PVC		280	0,032	0,040	0,050	0,055	0,063	0,090	

## ATORN® Roughing cutter Ultra-N PRO



• Please adjust these guideline values according to clamping operation and machine set-up!

249018 ....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						6	8	10	12	16	20
	Materials group										
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	530	0,090	0,120	0,150	0,180	0,230	0,290
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	500	0,090	0,120	0,150	0,180	0,230	0,290
	Thermoplastic		PVC		300	0,038	0,046	0,059	0,063	0,075	0,100

ISO	Finishing / Edge-banding fz for ae = 0,5 x D and ap = 1,0 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						6	8	10	12	16	20
	Materials group										
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	750	0,110	0,140	0,180	0,220	0,280	0,350
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	700	0,110	0,140	0,180	0,220	0,280	0,350
	Thermoplastic		PVC		400	0,045	0,055	0,070	0,075	0,090	0,120



... for automation.

Effective clamping ...

**ATORN®**  
Performance demands quality



**ATORN® Mini end milling cutter, mini torus milling cutter Ultra-MS**

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc m/min			ap max.		
					Ø ≤ 0.5 mm	Ø ≤ 1.5 mm	Ø > 1.5 mm	Ø ≤ 0.5 mm	Ø ≤ 1.5 mm	Ø > 1.5 mm
P	Machining steel	Up to 700	9 SMn 28	1.0715	20 - 50	30 - 60	40 - 60	0.01 - 0.04	0.01 - 0.09	0.05 - 0.5
	Unalloyed structural steel	Up to 700	St-52	1.0052	25 - 55	40 - 90	70 - 100	0.01 - 0.05	0.02 - 0.1	0.05 - 0.6
	Structural steel	700 - 950	Ck45	1.1191	25 - 55	40 - 90	70 - 100	0.01 - 0.05	0.02 - 0.1	0.05 - 0.6
	Tempering steel	500 - 950	42 CrMo4	1.7225	20 - 50	30 - 60	40 - 60	0.01 - 0.04	0.01 - 0.09	0.05 - 0.5
	Cast steel	Up to 950	GS 40	1.0416	85 - 100	20 - 50	30 - 60	0.01 - 0.04	0.01 - 0.09	0.05 - 0.5
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	20 - 35	20 - 40	30 - 40	0.035	0.08	0.5
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	22 - 50	30 - 60	45 - 60	0.04	0.13	0.65
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	22 - 60	40 - 120	90 - 150	0.04	0.13	0.65
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	22 - 50	30 - 60	45 - 60	0.04	0.13	0.65

256011....

256012....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	fz				
					Ø 0.5	Ø 0.9	Ø 1-1.5	Ø 1.6-2.5	Ø 2.5-4
P	Machining steel	Up to 700	9 SMn 28	1.0715	0.002 - 0.005	0.004 - 0.008	0.005 - 0.014	0.01 - 0.023	0.015 - 0.03
	Unalloyed structural steel	Up to 700	St-52	1.0052	0.002 - 0.005	0.003 - 0.01	0.006 - 0.015	0.01 - 0.025	0.02 - 0.035
	Structural steel	700 - 950	Ck45	1.1191	0.002 - 0.005	0.003 - 0.01	0.006 - 0.015	0.01 - 0.025	0.02 - 0.035
	Tempering steel	500 - 950	42 CrMo4	1.7225	0.002 - 0.005	0.004 - 0.008	0.005 - 0.014	0.01 - 0.023	0.015 - 0.03
	Cast steel	Up to 950	GS 40	1.0416	0.002 - 0.005	0.004 - 0.008	0.005 - 0.014	0.01 - 0.023	0.015 - 0.03
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	0.003 - 0.005	0.004 - 0.008	0.005 - 0.014	0.01 - 0.023	0.015 - 0.035
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.002 - 0.007	0.004 - 0.008	0.006 - 0.015	0.01 - 0.023	0.025 - 0.035
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.001 - 0.005	0.003 - 0.009	0.006 - 0.021	0.016 - 0.03	0.035 - 0.06
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.002 - 0.007	0.004 - 0.008	0.006 - 0.015	0.01 - 0.023	0.025 - 0.035

**ATORN® End milling cutter, torus milling cutter Ultra-MS**

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc m/min					
					Ø ≤ 0.5 mm	Ø 3 - 4 fz	Ø 5 - 6 fz	Ø 8 - 10 fz	Ø 12 - 16 fz	Ø 16 - 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	120 - 140	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
	Unalloyed structural steel	Up to 700	St-52	1.0052	130 - 150	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
	Structural steel	700 - 950	Ck45	1.1191	130 - 150	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
	Tempering steel	500 - 950	42 CrMo4	1.7225	120 - 140	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
	Cast steel	Up to 950	GS 40	1.0416	120 - 140	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	60 - 80	0.014 - 0.022	0.024 - 0.032	0.036 - 0.048	0.05 - 0.07	0.06 - 0.09
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	60 - 80	0.014 - 0.022	0.024 - 0.032	0.036 - 0.048	0.051 - 0.071	0.065 - 0.087
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12

256007....

256008....  
256010....**ATORN® Mini radius milling cutter Ultra-MS**

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc m/min			fz				
					Ø ≤ 1.5 mm	Ø ≤ 1.5 mm	Ø > 1.5 mm	Ø 0.2-0.5	Ø 0.6-0.9	Ø 1.0-1.5	Ø 1.6-2.5	Ø 2.5-4.0
P	Machining steel	Up to 700	9 SMn 28	1.0715	20 - 45	40 - 60	40 - 60	0.001 - 0.005	0.005 - 0.008	0.006 - 0.01	0.011 - 0.019	0.019 - 0.035
	Unalloyed structural steel	Up to 700	St-52	1.0052	25 - 60	50-100	70 - 100	0.002 - 0.004	0.004 - 0.01	0.008 - 0.015	0.01 - 0.02	0.02 - 0.035
	Structural steel	700 - 950	Ck45	1.1191	25 - 60	50-100	70 - 100	0.002 - 0.004	0.004 - 0.01	0.008 - 0.015	0.01 - 0.02	0.02 - 0.035
	Tempering steel	500 - 950	42 CrMo4	1.7225	25 - 45	40 - 60	40-60	0.001 - 0.005	0.005 - 0.008	0.006 - 0.01	0.011 - 0.019	0.019 - 0.035
	Cast steel	Up to 950	GS 40	1.0416	20 - 45	40 - 60	40 - 60	0.001 - 0.005	0.005 - 0.008	0.006 - 0.01	0.011 - 0.019	0.019 - 0.35
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	20 - 40	28 - 40	28 - 40	0.002 - 0.005	0.005 - 0.008	0.007 - 0.014	0.011 - 0.018	0.019 - 0.035
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 50	40 - 60	45 - 60	0.001 - 0.005	0.005 - 0.006	0.006 - 0.01	0.011 - 0.019	0.019 - 0.035
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 60	50 - 150	100 - 150	0.002 - 0.007	0.007 - 0.01	0.01 - 0.028	0.021 - 0.038	0.04 - 0.075
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	20 - 50	40 - 60	45 - 60	0.001 - 0.005	0.005 - 0.009	0.006 - 0.01	0.011 - 0.019	0.019 - 0.035

256013....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc m/min					
					Ø ≤ 0.5 mm	Ø 3 - 4 fz	Ø 5 - 6 fz	Ø 8 - 10 fz	Ø 12 - 16 fz	Ø 16 - 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
	Unalloyed structural steel	Up to 700	St-52	1.0052	140 - 160	0.022 - 0.033	0.034 - 0.042	0.043 - 0.057	0.062 - 0.083	0.073 - 0.12
	Structural steel	700 - 950	Ck45	1.1191	140 - 160	0.022 - 0.033	0.034 - 0.042	0.043 - 0.057	0.062 - 0.083	0.073 - 0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
	Cast steel	Up to 950	GS 40	1.0416	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	65 - 85	0.016 - 0.025	0.026 - 0.035	0.038 - 0.05	0.052 - 0.073	0.063 - 0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	60 - 80	0.014 - 0.022	0.024 - 0.032	0.036 - 0.048	0.051 - 0.071	0.065 - 0.087
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12



**SARA® Mini torus cutter DIA+**

• Please adjust these guideline values according to clamping operation and machine set-up!

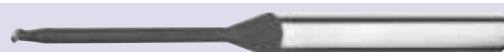
258005....

ISO	<b>Roughing</b> Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	<b>Roughing</b> Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ISO	<b>Finishing</b> Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.003	0.004	0.008	0.015	0.02	0.025

ISO	<b>Finishing</b> Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.03	0.040	0.06	0.080	0.1	0.12

**SARA® Mini radius milling cutter DIA+**

• Please adjust these guideline values according to clamping operation and machine set-up!

258006....

ISO	<b>Roughing</b> Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	<b>Roughing</b> Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ISO	<b>Finishing</b> Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.003	0.004	0.008	0.015	0.02	0.025

ISO	<b>Finishing</b> Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.03	0.040	0.06	0.080	0.1	0.12

**SARA® Torus milling cutter DIA+**

• Please adjust these guideline values according to clamping operation and machine set-up!

258013....

ISO	<b>Roughing</b> Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	<b>Roughing</b> Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ISO	<b>Finishing</b> Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.003	0.004	0.008	0.015	0.02	0.025

ISO	<b>Finishing</b> Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.03	0.040	0.06	0.080	0.1	0.12

**SARA® Torus milling cutter, long DIA+**

• Please adjust these guideline values according to clamping operation and machine set-up!

258014....

ISO	<b>Roughing</b> Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	<b>Roughing</b> Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ISO	<b>Finishing</b> Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	<b>Finishing</b> Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

## ATORN® Milling cutter for composite materials



• Please adjust these guideline values according to clamping operation and machine set-up!

**250603 ....**  
**250604 ....**      **250618....**  
**250619....**

ISO	Materials group	Cutting speed Vc m/min	Application	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
				2	4	6	8	10	12	16	20
G	Thermoset	200 - 300	Roughing	0.024	0.048	0.072	0.096	0.12	0.144	0.192	0.204
	Hardwood	200 - 250	Finishing	0.018	0.036	0.054	0.072	0.09	0.108	0.144	0.18
	Compressed board	200 - 250	Groove milling	0.016	0.032	0.048	0.064	0.08	0.096	0.128	0.16
			Copy-roughing	0.028	0.056	0.084	0.112	0.14	0.168	0.224	0.28
	Thermoplastic	250 - 400	Roughing	0.024	0.048	0.072	0.096	0.12	0.144	0.192	0.24
			Polycarbonate	250 - 350	Finishing	0.022	0.044	0.066	0.088	0.11	0.132
	Non-ferrous materials	250 - 350	Groove milling	0.017	0.034	0.051	0.068	0.085	0.102	0.163	0.17
			Copy-roughing	0.037	0.074	0.111	0.148	0.185	0.222	0.296	0.37
	Hard rubber	50 - 150	Copy-roughing	0.030	0.060	0.090	0.120	0.15	0.18	0.24	0.3
			N	Kevlar	90 - 150	All		0.012	0.016	0.022	0.027
Honeycomb	350	All						0.060	0.060	0.06	0.06
Fibre-reinforced plastics GRRP/CFRP	150 - 250	Roughing	0.026	0.052	0.078	0.104	0.13	0.156	0.028	0.26	
		Finishing	0.024	0.048	0.072	0.096	0.12	0.144	0.192	0.24	
		Groove milling	0.020	0.040	0.060	0.080	0.1	0.12	0.16	0.2	
Correction factors											
Corner and contour milling, roughing								ap = 1.0 x D		ae = 0.5 x D	
Corner and contour milling, finishing								ap = 1.0 x D		ae = 0.1 x D	
Groove milling								ap = 0.5 x D		ae = 1.0 x D	
Copy milling, roughing								ap = 0.5 x D		ae = 0.5 x D	
Copy milling, finishing								ap = 0.03 x D		ae = 0.02 x D	

**250605 ....**      **250607 ....**      **250609 ....**      **250611 ....**      **250613 ....**      **250615 ....**      **250617 ....**  
**250606 ....**      **250608 ....**      **250610 ....**      **250612 ....**      **250614 ....**      **250616 ....**

ISO	Materials group	Cutting speed Vc m/min	Application	Feed f in mm/rev in relation to milling cutter diameter in mm								
				2	4	6	8	10	12	16	20	
G	Thermoset	200 - 300	Fine	0.2	0.4	0.6	0.8	1.0	1.2	1.6	2.0	
	Hardwood	200 - 250	Medium	0.14	0.28	0.42	0.56	0.7	0.85	1.12	1.4	
	Compressed board	200 - 250	Coarse	0.12	0.24	0.36	0.48	0.6	0.72	0.96	1.2	
	Thermoplastic	250 - 400	Fine	0.16	0.32	0.48	0.64	0.8	0.96	1.28	1.6	
	Polycarbonate	250 - 350	Medium	0.13	0.26	0.39	0.52	0.65	0.78	1.04	1.3	
	Non-ferrous materials	250 - 350	Coarse	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.0	
			N	Fibre-reinforced plastics GRRP/CFRP	150 - 250	Fine contour	0.16	0.32	0.48	0.64	0.8	0.96
	Medium contour	0.14				0.28	0.42	0.56	0.7	0.84	1.12	1.4
	Coarse contour	0.12				0.24	0.36	0.48	0.6	0.72	0.96	1.2
	Fine grooves	0.14			0.28	0.42	0.56	0.7	0.84	1.12	1.4	
Medium grooves	0.12	0.24			0.36	0.48	0.6	0.72	0.96	1.2		
Coarse grooves	0.1	0.2			0.3	0.4	0.5	0.6	0.8	1.0		
Correction factors												
Corner and contour milling, roughing								ap = 1.0 x D		ae = 0.1 x D		
Corner and contour milling, finishing								ap = 0.75 x D		ae = 0.03 x D		
Groove milling								ap = 0.3 x D		ae = 1.0 x D		

**250600 ....**  
**250601 ....**  
**250602 ....**

ISO	Materials group	Cutting speed Vc m/min	Application	Feed f in mm/rev in relation to milling cutter diameter in mm			
				6	8	10	12
N	Fibre-reinforced plastics GRRP/CFRP	70 - 100	Groove milling	0.06	0.1	0.15	0.2
		150 - 200	Contour milling	0.06	0.1	0.15	0.2
Correction factors							
Corner and contour milling, roughing				ap = dependent on up and down-cut transition      ae = 0.5 x D			

## Contour milling cutter for GFRP and CFRP



• Please adjust these guideline values according to clamping operation and machine set-up!

**250050....**  
**250051....**      **250052....**  
**250053....**

**Type A:** smooth face  
**Type B:** rotary milling cutter face  
**Type C:** end milling cutter face  
**Type D:** drill bit

Ø mm	Rotational speed rpm	Feed mm / min.
1.6	40,000 - 45,000	1,000 - 1,500
2.4	25,000 - 30,000	1,100 - 1,800
3	20,000 - 25,000	1,100 - 1,800
4	20,000 - 24,000	900 - 1,700
6	20,000 - 24,000	900 - 1,700
10	15,000 - 20,000	700 - 1,500
12	10,000 - 15,000	500 - 1,300

## Carbide metal rotary burs

### Usage recommendations, cut types, comparison tables



#### Usage recommendations

Material	Cut 6	Cut 2	Aluminium cut
	universal cross-toothed with high machining performance and smooth running, for use with high-alloy, stainless steels, cast irons and weld seams	standard toothed for machining cast steel, hardened and unhardened steels as well as weld seams	special aluminium teeth with large chip chambers, for machining aluminium, non-ferrous metals, hard rubber, reaction wood, hard wood and plastics
Steel	●	●	
Hardened steel	●	●	
Stainless steel	●	●	
Cast iron	●	●	
Titanium	●	●	
Nickel	●	●	
Copper, copper alloys	●	●	
Aluminium			●
Plastic			●

#### Comparison of cut type designation

Type of cut	ATORN	BIAX	Pferd	Lukas
Cross cut	6	63	3 Plus	7
Standard cut	2	3	3	3
Aluminium cut	ALU	13	Alu	9

#### Designations of carbide metal rotary burs

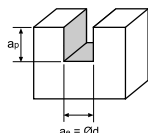
Type	ATORN	DIN (as per 8033)	BIAX	Pferd	Lukas
Cylindrical shape without end cut	ZYA	ZYA	TCA	HMA	HFA
Cylindrical shape with end cut	ZYAS	ZYA...S	TCB	HMA...ST	HFAS
Ball nosed cylinder shape	WRC	WRC	TCC	HMC	HFC
Ball shape	KUD	KUD	TCD	HMF	HFD
Oval shape	TRE	TRE	TCE	HMO	HFE
Ball nosed tree shape	RBF	RBF	TCF	HMH	HFF
Pointed tree shape	SPG	SPG	TCG	HMK	HFG
Flame shape	H	-	TCH	HMB	HFH
Ball nosed cone shape	KEL	KEL	TCK	HML	HFL
Cone shape	SKM	SKM	TCI	HMG	HFM
Inverted cone shape	WKN	WKN	TCN	HMW	HFN

#### Speed recommendation

		Head diameter				
		3 mm	6 mm	10 mm	12 mm	16 mm
Material	max. speed r/min	90.000	65.000	55.000	35.000	25.000
Aluminium Plastic	Speed range	60.000 - 80.000	15.000 - 60.000	10.000 - 50.000	7.000 - 30.000	6.000 - 20.000
	Optimum speed	65.000	40.000	25.000	20.000	15.000
Brass, copper, copper alloy, cast iron, bronze	Speed range	45.000 - 80.000	22.500 - 60.000	15.000 - 40.000	11.000 - 30.000	9.000 - 20.000
	Optimum speed	65.000	45.000	30.000	25.000	20.000
Steel	Speed range	60.000 - 80.000	45.000 - 60.000	30.000 - 40.000	22.500 - 30.000	18.000 - 20.000
	Optimum speed	80.000	50.000	30.000	25.000	20.000
Hardened steel, stainless steel, Titanium, nickel	Speed range	60.000 - 80.000	30.000 - 45.000	19.000 - 30.000	15.000 - 22.500	12.000 - 18.000
	Optimum speed	80.000	40.000	25.000	20.000	15.000

## ATORN® Mini end milling cutter, mini torus milling cutter RockTec 65

- The lower Vc values apply respectively for long clearances and the smaller diameter range; the higher Vc values for short clearance lengths and the larger diameter range. This also applies for the specified ap max. value.
- Please adjust these guideline values according to clamping operation and machine set-up!

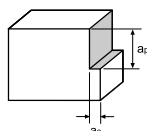


ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Diameter range ≤ 0.5 mm		Diameter range 0.6 - 1 mm		Diameter range > 1 mm	
					Vc m/min	ap max.	Vc m/min	ap max.	Vc m/min	ap max.
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 80	0.002 - 0.02	70 - 90	0.003 - 0.045	80-100	0.015 - 0.35
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 80	0.002 - 0.02	70 - 90	0.003 - 0.045	80-100	0.015 - 0.35
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	15 - 45	0.003 - 0.025	30 - 70	0.004 - 0.05	50 - 80	0.02 - 0.4
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 45	0.002 - 0.02	30 - 70	0.003 - 0.045	50 - 80	0.015 - 0.35
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	13 - 40	0.002 - 0.02	30 - 55	0.003 - 0.04	35 - 65	0.015 - 0.3
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	50 - 70	0.002 - 0.02	60 - 80	0.003 - 0.04	70 - 90	0.015 - 0.15
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	50 - 70	0.002 - 0.02	60 - 80	0.003 - 0.04	70 - 90	0.015 - 0.15
	Hardened materials up to 64 HRC		100Cr6	1.2067	40 - 60	0.001 - 0.01	50 - 70	0.003 - 0.015	60 - 80	0.015 - 0.08

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
					0.1 - 0.3	0.4-0.8	0.9 - 1.5	1.6 - 2	2.5 - 3
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018	0.014 - 0.025	0.018 - 0.035
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018	0.014 - 0.025	0.018 - 0.035
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018	0.014 - 0.025	0.018 - 0.035
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018	0.014 - 0.025	0.018 - 0.035
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.002 - 0.005	0.003 - 0.007	0.008 - 0.014	0.012 - 0.023	0.018 - 0.035
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.002 - 0.004	0.002 - 0.007	0.006 - 0.012	0.011 - 0.018	0.016 - 0.022
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	0.002 - 0.004	0.002 - 0.007	0.006 - 0.012	0.011 - 0.018	0.016 - 0.022
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.001 - 0.003	0.001 - 0.003	0.003 - 0.009	0.008 - 0.016	0.015 - 0.022

## ATORN® End milling cutter, multi-flute milling cutter, torus milling cutter RockTec 65

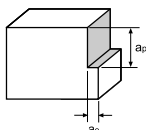
- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae Max.	ap Max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.2 x D	1.5 x D	160 - 200	0.02	0.04	0.08	0.1	0.11	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	160 - 200	0.02	0.04	0.08	0.1	0.11	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	250 - 300	0.02	0.04	0.08	0.1	0.1	0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	250 - 300	0.02	0.04	0.08	0.1	0.1	0.1
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.2 x D	1.5 x D	250 - 300	0.02	0.04	0.08	0.1	0.1	0.1
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.05 x D	1 x D	120 - 140	0.02	0.03	0.06	0.08	0.09	0.1
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	0.05 x D	1 x D	120 - 140	0.02	0.03	0.06	0.08	0.09	0.1
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.03-0.05 x D (max. 0.2-0.5 mm)	1 x D	80-120	0.015	0.025	0.05	0.06	0.07	0.08

## ATORN® End milling cutter, multi-flute milling cutter, torus milling cutter RockTec 65

• Please adjust these guideline values according to clamping operation and machine set-up!

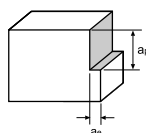


257006...  
257014...  
257020...

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae Max.	ap Max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.2 x D	1.5 x D	140 - 160	0.02	0.04	0.08	0.1	0.11	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	140 - 160	0.02	0.04	0.08	0.1	0.11	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	200 - 260	0.02	0.04	0.08	0.1	0.1	0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	200 - 260	0.02	0.04	0.08	0.1	0.1	0.1
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.2 x D	1.5 x D	200 - 260	0.02	0.04	0.08	0.1	0.1	0.1
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.05 x D	1 x D	100 - 130	0.02	0.03	0.06	0.08	0.09	0.1
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	0.05 x D	1 x D	100 - 130	0.02	0.03	0.06	0.08	0.09	0.1
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.03-0.05 x D (max. 0.2-0.5 mm)	1 x D	70 - 100	0.015	0.025	0.05	0.06	0.07	0.08

## ATORN® End milling cutter, torus milling cutter RockTec 65

• Please adjust these guideline values according to clamping operation and machine set-up!



257008...  
257022...

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae Max.	ap Max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.2 x D	1.5 x D	120 - 140	0.02	0.04	0.08	0.1	0.11	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	120 - 140	0.02	0.04	0.08	0.1	0.11	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	130 - 170	0.02	0.04	0.08	0.1	0.1	0.1
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	130 - 170	0.02	0.04	0.08	0.1	0.1	0.1
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.2 x D	1.5 x D	130 - 170	0.02	0.04	0.08	0.1	0.1	0.1
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.05 x D	1 x D	80 - 110	0.02	0.03	0.06	0.08	0.09	0.1
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	0.05 x D	1 x D	80 - 110	0.02	0.03	0.06	0.08	0.09	0.1
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.03-0.05 x D (max. 0.2-0.5 mm)	1 x D	50 - 80	0.015	0.025	0.05	0.06	0.07	0.08

## ATORN® Solid carbide high-feed milling cutter RockTec 65

• Please adjust these guideline values according to clamping operation and machine set-up!  
• Contour milling or milling in the Z-direction, please mill with an inclination of 1° or more, and reduce the feed rate to 60-70%.



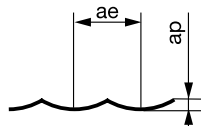
257040...  
294048...  
294049...

Steel < 1.400 N/mm <sup>2</sup> , hardened steel 45-55 HRC				
Diameter	VC= 160 m/min n (rpm)	Feed (mm/min)	ae	ap
4	12.500	5.000	2	0.1
5	10.000	5.200	2.5	0.125
6	8.500	5.440	3	0.15
8	6.300	5.500	4	0.2
10	5.100	5.500	5	0.25
12	4.200	5.300	6	0.3

Hard cast iron < 52 HRC, hardened steel 55-60 HRC				
Diameter	VC= 120 m/min n (rpm)	Feed (mm/min)	ae	ap
4	9.500	2.280	2	0.07
5	7.600	2.400	2.5	0.088
6	6.300	2.500	3	0.105
8	4.700	2.600	4	0.14
10	3.800	2.700	5	0.175
12	3.150	2.600	6	0.21

## ATORN® Mini radius milling cutter RockTec 65

- The lower Vc values apply respectively for long clearances and the smaller diameter range; the higher Vc values for short clearance lengths and the larger diameter range. This also applies for the specified ap max. value.
- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Diameter range ≤ 0.5 mm		Diameter range 0.6 - 1 mm		Diameter range > 1 mm	
					Vc m/min	ap max.	Vc m/min	ap max.	Vc m/min	ap max.
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 80	0.006 - 0.025	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 80	0.006 - 0.025	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 55	0.007 - 0.03	30 - 75	0.01 - 0.05	50 - 100	0.04 - 0.15
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	25 - 45	0.006 - 0.025	30 - 60	0.01 - 0.05	40 - 80	0.04 - 0.15
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	25 - 45	0.005 - 0.02	30 - 60	0.01 - 0.05	40 - 80	0.04 - 0.15
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	50 - 70	0.004 - 0.015	60 - 80	0.008 - 0.05	70 - 90	0.02 - 0.15
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	50 - 70	0.003 - 0.015	60 - 80	0.008 - 0.05	70 - 90	0.02 - 0.15
	Hardened materials up to 64 HRC		100Cr6	1.2067	40 - 60	0.003 - 0.015	50 - 70	0.008 - 0.05	60 - 80	0.02 - 0.15

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
					0.2 - 0.3	0.4-0.8	0.9 - 1.5	1.6 - 2	2.5 - 3
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012	0.01 - 0.028	0.015 - 0.032
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012	0.01 - 0.028	0.015 - 0.032
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012	0.01 - 0.028	0.015 - 0.032
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.003 - 0.004	0.003 - 0.008	0.004 - 0.01	0.006 - 0.022	0.013 - 0.029
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.003 - 0.004	0.003 - 0.007	0.004 - 0.009	0.006 - 0.016	0.013 - 0.022
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.002 - 0.004	0.002 - 0.005	0.003 - 0.008	0.004 - 0.011	0.011 - 0.021
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	0.002 - 0.004	0.002 - 0.005	0.003 - 0.01	0.004 - 0.011	0.011 - 0.021
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.001 - 0.004	0.001 - 0.005	0.003 - 0.01	0.004 - 0.011	0.011 - 0.021



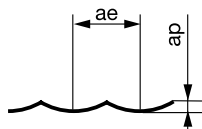
... 3 μm

Radial run-out ...

**ATORN®**  
Performance demands quality

# ATORN® Radius milling cutter RockTec 65

• Please adjust these guideline values according to clamping operation and machine set-up!

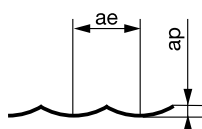


257028....



257036....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae Max.	ap Max.	Vc m/min		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							Diameter range		2 - 3	4 - 5	6 - 8	10 - 12	16	20
							2 - 3 mm	4 - 20 mm						
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.4 x R	0.1 x R	180-270	250 - 370	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	150 - 210	210-270	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.4 x R	0.1 x R	100 - 160	160 - 220	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	0.4 x R	0.1 x R	100 - 160	160 - 220	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.4 x R	0.1 x R	50 - 75	60 - 80	0.025 - 0.035	0.035 - 0.05	0.045 - 0.08	0.07 - 0.11	0.08 - 0.11	0.08 - 0.11

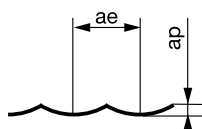


257030....



257038....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae Max.	ap Max.	Vc m/min		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							Diameter range		2 - 3	4 - 5	6 - 8	10 - 12	16	20
							2 - 3 mm	4 - 20 mm						
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.4 x R	0.1 x R	130 - 250	200 - 320	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	130 - 230	200 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	130 - 230	200 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	130 - 230	200 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	120 - 200	160 - 260	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.4 x R	0.1 x R	100 - 150	130 - 200	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	0.4 x R	0.1 x R	100 - 150	130 - 200	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.4 x R	0.1 x R	40 - 60	45 - 65	0.025 - 0.035	0.035 - 0.05	0.045 - 0.08	0.07 - 0.11	0.08 - 0.11	0.08 - 0.11



257032....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	ae Max.	ap Max.	Vc m/min		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							Diameter range		2 - 3	4 - 5	6 - 8	10 - 12	16	20
							2 - 3 mm	4 - 20 mm						
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.4 x R	0.1 x R	80 - 140	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	80 - 140	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	80 - 140	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	80 - 140	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	70 - 130	120-180	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	0.4 x R	0.1 x R	60 - 110	90 - 130	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	0.4 x R	0.1 x R	60 - 110	90 - 130	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 64 HRC		100Cr6	1.2067	0.4 x R	0.1 x R	25 - 40	30 - 45	0.025 - 0.035	0.035 - 0.05	0.045 - 0.08	0.07 - 0.11	0.08 - 0.11	0.08 - 0.11



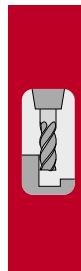
## SARA® Quadrant milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

291310....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in relation to diameter D1 in mm with ae 0.05 x D and ap 1.5 x D				
						8	10	12	16	20 - 25
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 95	0.03 - 0.05	0.04 - 0.06	0.05 - 0.07	0.05 - 0.08	0.06 - 0.09
	Unalloyed structural steel	Up to 700	St52	1.0052	70 - 100	0.03 - 0.05	0.04 - 0.06	0.05 - 0.07	0.05 - 0.08	0.06 - 0.09
	Structural steel	700 - 950	Ck45	1.1191	60 - 100	0.04 - 0.05	0.05 - 0.06	0.06 - 0.07	0.07 - 0.08	0.08 - 0.09
	Cast steel	Up to 950	GS 40	1.0416	60 - 95	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	60 - 95	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	35 - 60	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	35 - 70	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	25 - 60	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	70 - 95	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	60 - 85	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60 - 80	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	60 - 80	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	140 - 500	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	0.04 - 0.07	0.05 - 0.08
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	140 - 500	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	0.04 - 0.07	0.05 - 0.08
S	Copper alloy (brass) long-chipping	Up to 600	Cu Zn 20	2.0250	85 - 180	0.01 - 0.015	0.01 - 0.02	0.02 - 0.03	0.02 - 0.03	0.03 - 0.04
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	95 - 190	0.01 - 0.015	0.01 - 0.02	0.02 - 0.03	0.02 - 0.03	0.03 - 0.04
H	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	10 - 30	0.01 - 0.015	0.01 - 0.02	0.02 - 0.03	0.02 - 0.03	0.03 - 0.04
	Hardened materials up to 55 HRC		X40Cr14	1.2083	65 - 90	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	0.04 - 0.07	0.05 - 0.08
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	65 - 90	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	0.04 - 0.07	0.05 - 0.08



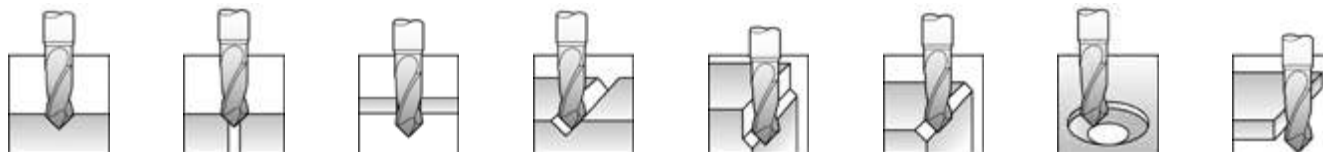
## SARA® Multifunction tool MULTI-V



• Please adjust these guideline values according to clamping operation and machine set-up!

251541....

251546....  
251549....



Boring 90°, 120°    Countersinking 60°, 90°, 120°    Drilling 90°, 120°    V-slot milling 60°, 90°, 120°    Combi-milling 60°, 90°, 120°    Chamfer milling 60°, 90°, 120°    Circular cutting 60°, 90°, 120°    Side milling 60°, 90°, 120°

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Cutting speed Vc m/min	Feed fz in mm/tooth																	
				Boring / Drilling / Countersinking						V-slot milling						Combi-milling / Chamfer milling / Circular cutting / Side milling					
				Ø 3 - 4	Ø 5 - 6	Ø 8 - 10	Ø 12	Ø 16	Ø 20	Ø 3 - 4	Ø 5 - 6	Ø 8 - 10	Ø 12	Ø 16	Ø 20	Ø 3 - 4	Ø 5 - 6	Ø 8 - 10	Ø 12	Ø 16	Ø 20
P	Steel	Up to 500	70 - 75	0.05	0.08	0.14	0.19	0.24	0.28	0.005	0.008	0.014	0.019	0.025	0.03	0.008	0.014	0.025	0.04	0.052	0.065
	Steel	500 - 800	40 - 60	0.05	0.08	0.14	0.2	0.25	0.28	0.005	0.008	0.014	0.019	0.025	0.03	0.008	0.013	0.025	0.04	0.052	0.062
	Steel	800 - 1,000	35 - 40	0.045	0.07	0.12	0.18	0.22	0.28	0.004	0.006	0.012	0.017	0.02	0.027	0.008	0.013	0.025	0.04	0.05	0.062
	Steel	1,000 - 1,300	30 - 35	0.045	0.07	0.12	0.17	0.22	0.26	0.004	0.006	0.012	0.016	0.02	0.027	0.008	0.013	0.025	0.036	0.05	0.06
M	Stainless steel		30 - 35	0.045	0.07	0.12	0.17	0.22	0.26	0.004	0.006	0.012	0.016	0.02	0.027	0.008	0.013	0.025	0.036	0.045	0.07
K	Grey cast iron up to 180 HB		35 - 40	0.045	0.07	0.12	0.18	0.22	0.28	0.004	0.006	0.012	0.017	0.02	0.027	0.008	0.013	0.025	0.04	0.045	0.062
	Grey cast iron over 180 HB		30 - 35	0.045	0.07	0.12	0.17	0.22	0.26	0.004	0.006	0.012	0.016	0.02	0.027	0.008	0.013	0.025	0.04	0.05	0.06
N	Aluminium		150	0.05	0.09	0.15	0.2	0.27	0.35	0.008	0.013	0.023	0.03	0.042	0.05	0.008	0.013	0.03	0.045	0.05	0.065
	Copper alloys		50-120	0.1	0.15	0.25	0.3	0.35	0.45	0.008	0.01	0.017	0.02	0.03	0.04	0.01	0.015	0.03	0.045	0.05	0.065
	Plastics		150	0.05	0.09	0.19	0.2	0.27	0.35	0.01	0.015	0.025	0.033	0.045	0.056	0.012	0.015	0.035	0.05	0.053	0.07
S	Special alloys		20	0.04	0.06	0.11	0.16	0.2	0.25	0.003	0.005	0.01	0.013	0.018	0.025	0.007	0.011	0.025	0.035	0.050	0.06
	Titanium		25-30	0.04	0.06	0.11	0.16	0.2	0.25	0.004	0.006	0.01	0.013	0.018	0.027	0.008	0.013	0.025	0.036	0.045	0.07

## ATORN® Solid carbide milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254157....

254158....

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	3			4			5		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	115-165	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	115-165	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	85-125	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750
S	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	45-65	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	45-65	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	6			8			10		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	115-165	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	115-165	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	85-125	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500
S	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	45-65	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	45-65	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	12			16			20		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	115-165	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	115-165	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	85-125	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000
S	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	45-65	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	45-65	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000

## ATORN® Solid carbide milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254153....

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	3			4			5		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	80-120	0.015-0.03	< 9.00	< 0.360	0.025-0.050	< 12.00	< 0.480	0.03-0.06	< 15.00	< 0.600
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	80-120	0.015-0.03	< 9.00	< 0.360	0.025-0.050	< 12.00	< 0.480	0.03-0.06	< 15.00	< 0.600

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	6			8			10		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	80-120	0.040-0.07	< 18.00	< 0.720	0.050-0.085	< 24.00	< 0.960	0.06-0.1	< 30.00	< 1.200
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	80-120	0.040-0.07	< 18.00	< 0.720	0.050-0.085	< 24.00	< 0.960	0.06-0.1	< 30.00	< 1.200

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	12			16			20		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	80-120	0.085-0.12	< 36.00	< 1.440	0.1-0.145	< 40.00	< 1.920	0.125-0.175	< 50.00	< 2.400
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	80-120	0.085-0.12	< 36.00	< 1.440	0.1-0.145	< 40.00	< 1.920	0.125-0.175	< 50.00	< 2.400

## ATORN® Solid carbide milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

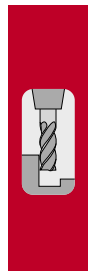
254154....

ISO	Side	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	2.5			3			4		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
	mm/tooth					max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	
H	Hardened steel	45-50 HRc			100-150	0.015-0.025	< 4.0	< 0.125	0.02-0.035	< 5.0	< 0.150	0.03-0.045	< 11.0	< 0.200
	Hardened steel	50-60 HRc			110-170	0.015-0.025	< 4.0	< 0.125	0.02-0.035	< 5.0	< 0.150	0.03-0.045	< 11.0	< 0.200

ISO	Side	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	5			6			8		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
	mm/tooth					max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	
H	Hardened steel	45-50 HRc			100-150	0.035-0.055	< 13.0	< 0.250	0.045-0.065	< 13.0	< 0.300	0.06-0.080	< 20.0	< 0.400
	Hardened steel	50-60 HRc			110-170	0.035-0.055	< 13.0	< 0.250	0.045-0.065	< 13.0	< 0.300	0.06-0.080	< 20.0	< 0.400

ISO	Side	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	10			12			14		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
	mm/tooth					max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	
H	Hardened steel	45-50 HRc			100-150	0.07-0.095	< 22.0	< 0.500	0.085-0.110	< 26.0	< 0.600	0.09-0.115	< 26.0	< 0.700
	Hardened steel	50-60 HRc			110-170	0.07-0.095	< 22.0	< 0.500	0.085-0.110	< 26.0	< 0.600	0.09-0.115	< 26.0	< 0.700

ISO	Side	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	16			18			20		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
	mm/tooth					max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	
H	Hardened steel	45-50 HRc			100-150	0.095-0.125	< 34.0	< 0.800	0.10-0.13	< 34.0	< 0.900	0.105-0.140	< 41.0	< 1.000
	Hardened steel	50-60 HRc			110-170	0.095-0.125	< 34.0	< 0.800	0.10-0.13	< 34.0	< 0.900	0.105-0.140	< 41.0	< 1.000



## palbit® PKD end milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up.

253025....

253026....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	cutting speed Vc m/min		Feed fz (mm/Z)		Cutting fluid
					min.	Max.	min.	Max.	
N	Al. alloys, long-chipping	up to 500	AlMg 3	3.3535	200	6000	0.05	0.30	Emulsion / MMS
	Al. alloys, short-chipping	up to 500	G-AlSi 12	3.2581	200	4000	0.05	0.25	
	Copper alloy (bronze), long-chipping	up to 1200	CuSn4	2.1016	250	3000	0.03	0.30	
	Graphite			CB000	150	2500	0.05	0.40	Dry / air
	Fibre-reinforced plastics			CFRP, GFRP	200	3000	0.05	0.40	
	Thermoplastic			PVC	100	1200	0.01	0.25	Emulsion / MMS
	Thermoset			Melamine	100	2500	0.05	0.30	

Materials group	Correction factor	Vc (m/min)
Aluminium casting alloys 5% < Si ≤ 12%	1.6	790-1000
Aluminium casting alloys 12% < Si	1.5	790-1000
Fibreglass-reinforced synthetic materials	1.0	400-500
Graphite	1.0	700-850

ØD mm	 $ap = 0.1 \times \text{øDc}$ $ae = 0.2 \times \text{øDc}$		 $ap = 0.05 \times \text{øDc}$	
	fz (mm/Z)		fz (mm/Z)	
3	0.020		0.022	
4	0.025		0.028	
6	0.035		0.040	
8	0.050		0.055	
10	0.060		0.070	
12	0.075		0.078	

## ATORN® Solid carbide milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254155....

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	3			4			5		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	240-300	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
	Machining steel	Up to 700	9 SMn 28	1.0715	240-300	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	160-240	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160-240	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130-200	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
	Cast steel	Up to 950	GS 40	1.0416	130-200	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
K	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	125-225	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	6			8			10		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	240-300	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
	Machining steel	Up to 700	9 SMn 28	1.0715	240-300	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	160-240	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160-240	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130-200	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
	Cast steel	Up to 950	GS 40	1.0416	130-200	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
K	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	125-225	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	12			16			20		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	240-300	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
	Machining steel	Up to 700	9 SMn 28	1.0715	240-300	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	160-240	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160-240	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130-200	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
	Cast steel	Up to 950	GS 40	1.0416	130-200	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
K	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	125-225	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000

## ATORN® Solid carbide milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254159....

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	3			4			5		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400-800	0.025-0.055	< 10.0	< 0.900	0.03-0.065	< 13.0	< 1.200	0.040-0.080	< 16.0	< 1.500
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	250-600	0.025-0.055	< 10.0	< 0.900	0.03-0.065	< 13.0	< 1.200	0.040-0.080	< 16.0	< 1.500
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	400-625	0.025-0.055	< 10.0	< 0.900	0.03-0.065	< 13.0	< 1.200	0.040-0.080	< 16.0	< 1.500
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	400-625	0.025-0.055	< 10.0	< 0.900	0.03-0.065	< 13.0	< 1.200	0.040-0.080	< 16.0	< 1.500

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	6			8			10		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400-800	0.055-0.1	< 18.0	< 1.800	0.080-0.12	< 22.0	< 2.400	0.095-0.140	< 25.0	< 3.000
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	250-600	0.055-0.1	< 18.0	< 1.800	0.080-0.12	< 22.0	< 2.400	0.095-0.140	< 25.0	< 3.000
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	400-625	0.055-0.1	< 18.0	< 1.800	0.080-0.12	< 22.0	< 2.400	0.095-0.140	< 25.0	< 3.000
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	400-625	0.055-0.1	< 18.0	< 1.800	0.080-0.12	< 22.0	< 2.400	0.095-0.140	< 25.0	< 3.000

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	12			14			16		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400-800	0.105-0.175	< 28.0	< 3.600	0.12-0.185	< 30.0	< 4.200	0.140-0.200	< 36.0	< 4.800
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	250-600	0.105-0.175	< 28.0	< 3.600	0.12-0.185	< 30.0	< 4.200	0.140-0.200	< 36.0	< 4.800
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	400-625	0.105-0.175	< 28.0	< 3.600	0.12-0.185	< 30.0	< 4.200	0.140-0.200	< 36.0	< 4.800
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	400-625	0.105-0.175	< 28.0	< 3.600	0.12-0.185	< 30.0	< 4.200	0.140-0.200	< 36.0	< 4.800

ISO	Side Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	18			20			25		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/tooth	max mm	max mm	mm/tooth	max mm	max mm	mm/tooth	max mm	max mm
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400-800	0.160-0.255	< 36.0	< 5.400	0.180-0.250	< 42.0	< 6.000	0.220-0.300	< 45.0	< 7.500
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	250-600	0.160-0.255	< 36.0	< 5.400	0.180-0.250	< 42.0	< 6.000	0.220-0.300	< 45.0	< 7.500
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	400-625	0.160-0.255	< 36.0	< 5.400	0.180-0.250	< 42.0	< 6.000	0.220-0.300	< 45.0	< 7.500
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	400-625	0.160-0.255	< 36.0	< 5.400	0.180-0.250	< 42.0	< 6.000	0.220-0.300	< 45.0	< 7.500

**HPMT Trochoidal end milling cutter**



• Please adjust these guideline values according to clamping operation and machine set-up!

254235....

254236 ....

ISO	Finishing / Edge-banding fz for ae = 0,1 - 0,15 x D and ap = 2,5 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
						4	5	6	8	10	12	16	20	
	Materials group													
P	Machining steel	Up to 700	9 SMn 28	1.0715	275	0,034	0,042	0,051	0,070	0,085	0,102	0,138	0,172	
	Unalloyed structural steel	Up to 700	St-52	1.0052	275	0,034	0,042	0,051	0,070	0,085	0,102	0,138	0,172	
	Structural steel	700 - 950	Ck45	1.1191	275	0,034	0,042	0,051	0,070	0,085	0,102	0,138	0,172	
	Tempering steel	500 - 950	42 CrMo4	1.7225	245	0,029	0,036	0,043	0,060	0,072	0,087	0,117	0,146	
	Cast steel	Up to 950	GS 40	1.0416	245	0,029	0,036	0,043	0,060	0,072	0,087	0,117	0,146	
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	240	0,025	0,031	0,038	0,051	0,063	0,078	0,105	0,133	
	Tempering steel	950 - 1300	43CrMo4	1.3563	240	0,025	0,031	0,038	0,051	0,063	0,078	1,105	1,133	
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	220	0,016	0,019	0,023	0,034	0,041	0,052	0,071	0,091	
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	220	0,016	0,019	0,023	0,034	0,041	0,052	1,071	1,091	
	M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	90	0,016	0,019	0,023	0,034	0,041	0,052	0,071	0,091
Stainless steel, austenitic		500 - 950	X 5 CrNi 18 10	1.4301	75	0,016	0,019	0,023	0,034	0,041	0,052	0,071	0,091	
K	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	60	0,012	0,016	0,019	0,025	0,033	0,042	0,058	0,071	
	Grey cast iron	Up to 260 HB	GG 25	0.6025	220	0,022	0,030	0,036	0,050	0,063	0,074	0,102	0,130	
S	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	175	0,016	0,021	0,025	0,035	0,043	0,051	0,072	0,095	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150	0,016	0,021	0,025	0,035	0,043	0,051	0,072	0,095	
S	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	95	0,013	0,017	0,020	0,028	0,034	0,041	0,058	0,076	
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	75	0,014	0,018	0,020	0,028	0,036	0,042	0,059	0,071	
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0,012	0,016	0,018	0,025	0,032	0,040	0,053	0,069	
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	50	0,013	0,017	0,019	0,026	0,034	0,041	0,055	0,070	



ISO	Finishing / Edge-banding fz for ae = 0,1 x D and ap = 3,5 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4	5	6	8	10	12	16	20
	Materials group												
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0,029	0,035	0,042	0,059	0,072	0,088	0,105	0,130
	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0,029	0,035	0,042	0,059	0,072	0,088	0,105	0,130
	Structural steel	700 - 950	Ck45	1.1191	200	0,029	0,035	0,042	0,059	0,072	0,088	0,105	0,130
	Tempering steel	500 - 950	42 CrMo4	1.7225	185	0,025	0,030	0,036	0,050	0,061	0,075	0,089	0,111
	Cast steel	Up to 950	GS 40	1.0416	185	0,025	0,030	0,036	0,050	0,061	0,075	0,089	0,111
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	180	0,025	0,030	0,036	0,050	0,062	0,078	0,100	0,120
	Tempering steel	950 - 1300	43CrMo4	1.3563	180	0,025	0,030	0,036	0,050	0,062	0,078	0,100	0,120
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	150	0,020	0,025	0,030	0,040	0,050	0,060	0,080	0,100
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	150	0,020	0,025	0,030	0,040	0,050	0,060	0,080	0,100
	M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80	0,014	0,018	0,020	0,028	0,038	0,046	0,060
Stainless steel, austenitic		500 - 950	X 5 CrNi 18 10	1.4301	65	0,014	0,018	0,020	0,028	0,038	0,046	0,060	0,078
K	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	55	0,014	0,018	0,020	0,028	0,038	0,046	0,060	0,078
	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0,027	0,034	0,040	0,056	0,069	0,084	0,104	0,128
S	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	100	0,014	0,018	0,020	0,028	0,038	0,046	0,060	0,078
	Ductile iron	Up to 280 HB	GGG 60	0.7060	85	0,014	0,018	0,020	0,028	0,038	0,046	0,060	0,078
S	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	55	0,011	0,014	0,016	0,022	0,030	0,037	0,048	0,062
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	70	0,014	0,018	0,020	0,028	0,036	0,042	0,059	0,071
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0,012	0,016	0,018	0,025	0,032	0,040	0,053	0,069
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	50	0,013	0,017	0,019	0,026	0,034	0,041	0,055	0,070

**Over 200,000 tools available online!**

**Advantages:**

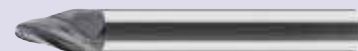
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



**Register online now!**

**www.saratools.com**

## ATORN® Circle segment milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254170....

254172 ....

ISO	copy / Finishing fz for ap = 0,05 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
						8	12	16
	Materials group							
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	600	0,064	0,096	0,130
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	550	0,064	0,096	0,130
	Thermoplastic		PVC		400	0,064	0,096	0,130

## ATORN® Circle segment milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

254171....

254173 ....

ISO	Roughing / Grooving fz for ap = 0,05 x D	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
						8	12	16
	Materials group							
	Machining steel	Up to 700	9 SMn 28	1.0715	190	0,064	0,096	0,130
	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0,064	0,096	0,130
	Structural steel	700 - 950	Ck45	1.1191	180	0,056	0,084	0,110
	Tempering steel	500 - 950	42 CrMo4	1.7225	180	0,056	0,084	0,110
P	Cast steel	Up to 950	GS 40	1.0416	180	0,056	0,084	0,110
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	150	0,048	0,072	0,096
	Tempering steel	950 - 1300	43CrMo4	1.3563	150	0,048	0,072	0,096
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	130	0,040	0,060	0,080
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	130	0,040	0,060	0,080
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	80	0,032	0,048	0,064
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	100	0,048	0,072	0,096
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	80	0,032	0,048	0,064
	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0,056	0,084	0,110
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	120	0,048	0,072	0,096
	Ductile iron	Up to 280 HB	GGG 60	0.7060	135	0,048	0,072	0,096
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	135	0,048	0,072	0,096
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	600	0,064	0,096	0,130
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	550	0,064	0,096	0,130
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	180	0,056	0,084	0,110
N	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180	0,056	0,084	0,110
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	170	0,056	0,084	0,110
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	170	0,056	0,084	0,110
	Thermoplastic		PVC		400	0,064	0,096	0,130
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	120	0,032	0,048	0,064

## ATORN® Ceramics milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

255153 ....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	6			8			10		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/Zahn	max mm	max mm	mm/Zahn	max mm	max mm	mm/Zahn	max mm	max mm
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	550	0,100	0,180	3,600	0,130	0,240	4,800	0,150	0,300	6,000

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	12			16			20		
						fz	ap	ae	fz	ap	ae	fz	ap	ae
						mm/Zahn	max mm	max mm	mm/Zahn	max mm	max mm	mm/Zahn	max mm	max mm
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	550	0,180	0,350	7,000	0,220	0,500	10,000	0,260	0,600	12,000



# ATORN® Sealing surface milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

255151 ....

255152....

ISO	Roughing / Grooving fz for ae = 1,0 x D and ap = 0,05 mm max	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4	5	6	8	10	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Unalloyed structural steel	Up to 700	St-52	1.0052	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Structural steel	700 - 950	Ck45	1.1191	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tempering steel	500 - 950	42 CrMo4	1.7225	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Cast steel	Up to 950	GS 40	1.0416	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tempering steel	950 - 1300	43CrMo4	1.3563	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035
Stainless steel, austenitic		500 - 950	X5 CrNi 18 10	1.4301	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
Duplex		700 - 950	X2 CrNiMoN 22-5-3	1.4462	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Ductile iron	Up to 280 HB	GGG 60	0.7060	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Thermoplastic		PVC		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Thermoset		Melamine		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Fibre-reinforced plastics		CFRP, GFRP		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
S	Graphite		C8000		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	fibre-reinforced plastics		Honeycomp		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040

ISO	Finishing / Edge-banding fz for ae = 1,0 x D and ap = 0,01 mm max	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4	5	6	8	10	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Unalloyed structural steel	Up to 700	St-52	1.0052	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Structural steel	700 - 950	Ck45	1.1191	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tempering steel	500 - 950	42 CrMo4	1.7225	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Cast steel	Up to 950	GS 40	1.0416	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tempering steel	950 - 1300	43CrMo4	1.3563	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035
Stainless steel, austenitic		500 - 950	X5 CrNi 18 10	1.4301	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
Duplex		700 - 950	X2 CrNiMoN 22-5-3	1.4462	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Ductile iron	Up to 280 HB	GGG 60	0.7060	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
N	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Thermoplastic		PVC		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Thermoset		Melamin		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Fibre-reinforced plastics		CFK, GFK		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
S	Graphite		C8000		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	fibre-reinforced plastics		Honeycomp		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040



Detailed cutting data recommendations for the hard-milling range can be found on our website. Simply scan in the QR code.



Cutting data

SARATOOLS.com  
POWER TO PRODUCE

ATORN®  
**RockTec PRO**

TRUE, INHERENT POWER.

CUTTING DATA  
RECOMMENDATIONS



## ATORN® Thread milling cutter options

### ISO internal thread

Thread	Core dimension	Required tool	Required indexable insert
M4x0.7 R	3.33	MTB 06031 C7 0.7 ISO*	-
M5x0.8 R	4.23	MTB 06038 C9 0.8 ISO*	-
M6x0.75	5.38	MTB 06045 C10 0.75 ISO*	-
M6x1.0 R	5.04	MTB 06046 C10 1.0 ISO*	-
M8x1.0	7.04	MTB 06046 C10 1.0 ISO*	-
M8x1.25 R	6.78	MTB 0606 C14 1.25 ISO*	-
M9x1.0	8.15	MTB 0606 C12 1.0 ISO*	-
M10x1.0	9.04	MTB 0808 D16 1.0 ISO*	-
M10x1.5	8.53	MTB 08078 C17 1.5 ISO*	-
M12x0.5	11.53	SR0009H12	12   0.5 ISO
M12x0.75	11.28	SR0009H12	12   0.75 ISO
M12x1.0	11.04	SR0009H12	12   1.0 ISO
M12x1.25	10.76	SR0009H12	12   1.25 ISO
M12x1.5	10.37	MTB 08078 C17 1.5 ISO*	-
M12x1.75 R	10.27	MTB 1009 C20 1.75 ISO*	-
M14x0.5	13.53	SR0012F14	14   0.5 ISO
M14x0.75	13.28	SR0012F14	14   0.75 ISO
M14x1.0	13.04	SR0009H12	12   1.0 ISO
M14x1.5	12.53	SR0009H12	12   1.5 ISO
M14x2.0 R	12.02	MTB1010C27 2.0 ISO*	-
M16x0.5	15.53	SR0012F14	14   0.5 ISO
M16x0.75	15.28	SR0012F14	14   0.75 ISO
M16x1.0	15.04	SR0012F14	14   1.0 ISO
M16x1.5	14.53	SR0012F14	14   1.5 ISO
M16x2.0 R	14.02	SR0012F14	14   2.0 ISO
M18x0.5	17.53	SR0012F14	14   0.5 ISO
M18x0.75	17.28	SR0012F14	14   0.75 ISO
M18x1.0	17.04	SR0012F14	14   1.0 ISO
M18x1.5	16.53	SR0012F14	14   1.5 ISO
M18x2.0	16.02	SR0012F14	14   2.0 ISO
M18x2.5 R	15.52	SR0012F14	14   2.5 ISO
M20x0.5	19.53	SR0014H14	14   0.5 ISO
M20x0.75	19.28	SR0014H14	14   0.75 ISO
M20x1.0	19.04	SR0014H14	14   1.0 ISO
M20x1.5	18.53	SR0014H14	14   1.5 ISO
M20x2.0	18.02	SR0014H14	14   2.0 ISO
M20x2.5 R	17.52	SR0014H14	14   2.5 ISO
M22x0.5	21.53	SR0017H14	14   0.5 ISO
M22x0.75	21.28	SR0017H14	14   0.75 ISO
M22x1.0	21.04	SR0017H14	14   1.0 ISO
M22x1.5	20.53	SR0017H14	14   1.5 ISO
M22x2.0	20.02	SR0017H14	14   2.0 ISO
M22x2.5 R	19.52	SR0017H14	14   2.5 ISO
M24x0.5	23.53	SR0017H14	14   0.5 ISO
M24x0.75	23.28	SR0017H14	14   0.75 ISO
M24x1.0	23.04	SR0018H21	21   1.0 ISO
M24x1.5	22.53	SR0018H21	21   1.5 ISO
M24x2.0	22.02	SR0018H21	21   2.0 ISO
M24x3.0 R	21.00	SR0018H21	21   3.0 ISO
M27x0.5	26.53	SR0017H14	14   0.5 ISO
M27x0.75	26.28	SR0017H14	14   0.75 ISO
M27x1.0	26.04	SR0021H21	21   1.0 ISO
M27x1.5	25.53	SR0021H21	21   1.5 ISO
M27x2.0	25.02	SR0021H21	21   2.0 ISO
M27x3.0 R	24.00	SR0021H21	21   3.0 ISO
M30x0.5	29.53	SR0017H14	14   0.5 ISO
M30x0.75	29.28	SR0017H14	14   0.75 ISO
M30x1.0	29.04	SR0021H21	21   1.0 ISO
M30x1.5	28.53	SR0021H21	21   1.5 ISO
M30x2.0	28.02	SR0021H21	21   2.0 ISO
M30x3.0	27.00	SR0021H21	21   3.0 ISO
M30x3.5 R	26.49	SR0021H21	21   3.5 ISO
M33x0.5	32.53	SR0017H14	14   0.5 ISO
M33x0.75	32.28	SR0017H14	14   0.75 ISO
M33x1.0	32.04	SR0021H21	21   1.0 ISO
M33x1.5	31.53	SR0021H21	21   1.5 ISO
M33x2.0	31.02	SR0021H21	21   2.0 ISO
M33x3.0	30.00	SR0021H21	21   3.0 ISO
M33x3.5 R	29.49	SR0021H21	21   3.5 ISO
M36x0.5	35.53	SR0017H14	14   0.5 ISO
M36x0.75	35.28	SR0017H14	14   0.75 ISO
M36x1.0	35.04	SR0021H21	21   1.0 ISO
M36x1.5	34.53	SR0029J30	30   1.5 ISO
M36x2.0	34.02	SR0029J30	30   2.0 ISO
M36x3.0	33.00	SR0029J30	30   3.0 ISO
M36x4.0	31.97	SR0029J30	30   4.0 ISO
M39x0.5	38.53	SR0017H14	14   0.5 ISO

Thread	Core dimension	Required tool	Required indexable insert
M39x0.75	38.28	SR0017H14	14   0.75 ISO
M39x1.0	38.04	SR0021H21	21   1.0 ISO
M39x1.5	37.53	SR0029J30	30   1.5 ISO
M39x2.0	37.02	SR0029J30	30   2.0 ISO
M39x3.0	36.00	SR0029J30	30   3.0 ISO
M39x4.0 R	34.97	SR0029J30	30   4.0 ISO
M42x0.5	41.53	SR0017H14	14   0.5 ISO
M42x0.75	41.28	SR0017H14	14   0.75 ISO
M42x1.0	41.04	SR0021H21	21   1.0 ISO
M42x1.5	40.53	SR0029J30	30   1.5 ISO
M42x2.0	40.02	SR0029J30	30   2.0 ISO
M42x3.0	39.00	SR0029J30	30   3.0 ISO
M42x4.0	37.97	SR0029J30	30   4.0 ISO
M42x4.5 R	37.46	SR0029J30	30   4.5 ISO
M45x0.5	44.53	SR0017H14	14   0.5 ISO
M45x0.75	44.28	SR0017H14	14   0.75 ISO
M45x1.0	44.04	SR0021H21	21   1.0 ISO
M45x1.5	43.53	SR0029J30	30   1.5 ISO
M45x2.0	43.02	SR0029J30	30   2.0 ISO
M45x3.0	42.00	SR0029J30	30   3.0 ISO
M45x4.0	40.97	SR0029J30	30   4.0 ISO
M45x4.5 R	40.46	SR0029J30	30   4.5 ISO
M48x0.5	47.53	SR0017H14	14   0.5 ISO
M48x0.75	47.28	SR0017H14	14   0.75 ISO
M48x1.0	47.04	SR0021H21	21   1.0 ISO
M48x1.5	46.53	SR0029J30	30   1.5 ISO
M48x2.0	46.02	SR0029J30	30   2.0 ISO
M48x3.0	45.00	SR0029J30	30   3.0 ISO
M48x4.0	43.97	SR0029J30	30   4.0 ISO
M52x0.5	51.53	SR0017H14	14   0.5 ISO
M52x0.75	51.28	SR0017H14	14   0.75 ISO
M52x1.0	51.04	SR0021H21	21   1.0 ISO
M52x1.5	50.53	SR0029J30	30   1.5 ISO
M52x2.0	50.02	SR0029J30	30   2.0 ISO
M52x3.0	49.00	SR0029J30	30   3.0 ISO
M52x4.0	47.97	SR0029J30	30   4.0 ISO
M56x0.5	55.53	SR0017H14	14   0.5 ISO
M56x0.75	55.28	SR0017H14	14   0.75 ISO
M56x1.0	55.04	SR0021H21	21   1.0 ISO
M56x1.5	54.53	SR0048M40	40   1.5 ISO
M56x2.0	54.02	SR0048M40	40   2.0 ISO
M56x3.0	53.00	SR0048M40	40   3.0 ISO
M56x4.0	51.97	SR0048M40	40   4.0 ISO
M60x0.5	59.53	SR0017H14	14   0.5 ISO
M60x0.75	59.28	SR0017H14	14   0.75 ISO
M60x1.0	59.04	SR0021H21	21   1.0 ISO
M60x1.5	58.53	SR0048M40	40   1.5 ISO
M60x2.0	58.02	SR0048M40	40   2.0 ISO
M60x3.0	57.00	SR0048M40	40   3.0 ISO
M60x4.0	55.97	SR0048M40	40   4.0 ISO
M64x0.5	63.53	SR0017H14	14   0.5 ISO
M64x0.75	63.28	SR0017H14	14   0.75 ISO
M64x1.0	63.04	SR0021H21	21   1.0 ISO
M64x1.5	62.53	SR0048M40	40   1.5 ISO
M64x2.0	62.02	SR0048M40	40   2.0 ISO
M64x3.0	61.00	SR0048M40	40   3.0 ISO
M64x4.0	59.97	SR0048M40	40   4.0 ISO
M64x6.0 R	57.90	SR0048M40	40   6.0 ISO
M68x0.5	67.53	SR0017H14	14   0.5 ISO
M68x0.75	67.28	SR0017H14	14   0.75 ISO
M68x1.0	67.04	SR0021H21	21   1.0 ISO
M68x1.5	66.53	SR0048M40	40   1.5 ISO
M68x2.0	66.02	SR0048M40	40   2.0 ISO
M68x3.0	65.00	SR0048M40	40   3.0 ISO
M68x4.0	63.97	SR0048M40	40   4.0 ISO
M68x6.0 R	61.91	SR0048M40	40   6.0 ISO
M70x0.5	69.53	SR0017H14	14   0.5 ISO
M70x0.75	69.28	SR0017H14	14   0.75 ISO
M70x1.0	69.04	SR0021H21	21   1.0 ISO
M70x1.5	68.53	SR0048M40	40   1.5 ISO
M70x2.0	68.02	SR0048M40	40   2.0 ISO
M70x3.0	67.00	SR0048M40	40   3.0 ISO
M70x4.0	65.97	SR0048M40	40   4.0 ISO
M70x6.0	63.91	SR0048M40	40   6.0 ISO

R = Standard thread

\* = Solid carbide milling cutter



## UN internal thread

Thread	Core dimension	Required tool	Required indexable insert
1/4x20UNC	5.12	MTB 06047 C12 20 UN*	-
1/4x28UNF	5.47	MTB 0605 C11 28 UN*	-
5/16x18UNC	6.57	MTB 06056 C14 18 UN*	-
5/16x20UN	6.71	MTB 06047 C12 20 UN*	-
5/16x24UNF	6.91	MTB 08066 C14 24 UN*	-
5/16x28UN	7.06	MTB 0606 C14 28 UN*	-
3/8x16UNC	7.98	MTB 08067 C16 16 UN*	-
3/8x18UNC	8.17	MTB 06056 C14 18 UN*	-
3/8x20UN	8.29	MTB 06047 C12 20 UN*	-
3/8x24UNF	8.51	MTB 0808 D21 24 UN*	-
3/8x28UN	8.65	MTB 0606 C14 28 UN*	-
7/16x14UNC	9.35	MTB 08077 C20 14 UN*	-
7/16x16UN	9.58	MTB 08067 C16 16 UN*	-
7/16x18UNS	9.74	MTB 06056 C14 18 UN*	-
7/16x20UNF	9.88	MTB 0808 C21 20 UN*	-
7/16x24UNS	10.08	MTB 0808 D21 24 UN*	-
7/16x28UNEF	10.24	MTB 0606 C14 28 UN*	-
1/2x13UNC	10.81	MTB 10092 C22 13 UN*	-
1/2x14UNS	10.93	MTB 08077 C20 14 UN*	-
1/2x20UNF	11.47	SR0009H12	12 I 20 UN
1/2x24UNS	11.68	SR0009H12	12 I 24 UN
1/2x28UNEF	11.82	SR0009H12	12 I 28 UN
9/16x12UNC	12.22	MTB 12105 C26 12 UN*	-
9/16x14UNS	12.52	MTB 08077 C20 14 UN*	-
9/16x16UN	12.75	SR0009H12	12 I 16 UN
9/16x18UNF	12.92	SR0009H12	12 I 18 UN
9/16x20UN	13.06	SR0009H12	12 I 20 UN
9/16x24UNEF	13.26	SR0009H12	12 I 24 UN
9/16x28UN	13.41	SR0009H12	12 I 28 UN
5/8x11UNC	13.63	MTB 12114 C28 11 UN*	-
5/8x12UN	13.82	SR0012F14	14 I 12 UN
5/8x14UNS	14.12	SR0012F14	14 I 14 UN
5/8x16UN	14.33	SR0012F14	14 I 16 UN
5/8xUNF	14.52	SR0012F14	14 I 18 UN
5/8x20UN	14.64	SR0012F14	14 I 20 UN
5/8x24UNEF	14.86	SR0012F14	14 I 24 UN
5/8x28UN	15.00	SR0012F14	14 I 28 UN
5/8x32UN	15.11	SR0012F14	14 I 32 UN
11/16x12UN	15.39	SR0012F14	14 I 12 UN
11/16x16UN	15.93	SR0012F14	14 I 16 UN
11/16x20UN	16.23	SR0012F14	14 I 20 UN
11/16x24UNEF	16.43	SR0012F14	14 I 24 UN
11/16x28UN	16.59	SR0012F14	14 I 28 UN
11/16x32UN	16.70	SR0012F14	14 I 32 UN
3/4x10UNC	16.57	MTB 16144 D34 10 UN*	-
3/4x12UN	16.99	SR0012F14	14 I 12 UN
3/4x14UNS	17.28	SR0012F14	14 I 14 UN
3/4x16UNF	17.50	SR0012F14	14 I 16 UN
3/4x18UNS	17.69	SR0012F14	14 I 18 UN
3/4x20UNEF	17.82	SR0012F14	14 I 20 UN
3/4x24UNS	18.03	SR0012F14	14 I 24 UN
3/4x28UN	18.17	SR0014H14	14 I 28 UN
3/4x32UN	18.29	SR0014H14	14 I 32 UN
13/16x12UN	18.57	SR0014H14	14 I 12 UN
13/16x16UN	19.10	SR0014H14	14 I 16 UN
13/16x20UNEF	19.41	SR0014H14	14 I 20 UN
13/16x28UN	19.76	SR0014H14	14 I 28 UN
13/16x32UN	19.88	SR0014H14	14 I 32 UN
7/8x9UNC	19.47	MTB 1616 C38 9 UN*	-
7/8x10UNS	19.75	MTB 16144 D34 10 UN*	-
7/8x12UN	20.17	SR0014H14	14 I 12 UN
7/8x14UNF	20.47	SR0014H14	14 I 14 UN
7/8x16UN	20.68	SR0014H14	14 I 16 UN
7/8x18UNS	20.87	SR0014H14	14 I 18 UN
7/8x20UNEF	20.99	SR0014H14	14 I 20 UN
7/8x24UNS	21.21	SR0017H14	14 I 24 UN
7/8x28UN	21.35	SR0017H14	14 I 28 UN
7/8x32UN	21.46	SR0017H14	14 I 32 UN
15/16x12UN	21.74	SR0017H14	14 I 12 UN
15/16x16UN	22.28	SR0017H14	14 I 16 UN
15/16x20UNEF	22.58	SR0017H14	14 I 20 UN
15/16x28UN	22.94	SR0017H14	14 I 28 UN
15/16x32UN	23.05	SR0017H14	14 I 32 UN
1x8UNC	22.29	MTB 20195 D42 8 UN*	-
1x10UNS	22.29	MTB 16144 D34 10 UN*	-
1x12UNF	23.34	SR0017H14	14 I 12 UN
1x14UNS	23.63	SR0017H14	14 I 14 UN
1x16UN	23.85	SR0017H14	14 I 16 UN
1x18UNS	24.04	SR0017H14	14 I 18 UN
1x20UNEF	24.17	SR0017H14	14 I 20 UN
1x24UNS	24.38	SR0017H14	14 I 24 UN
1x28UN	24.52	SR0017H14	14 I 28 UN
1x32UN	24.64	SR0017H14	14 I 32 UN
1 1/16x12UN	24.92	SR0017H14	14 I 12 UN
1 1/16x16UN	25.45	SR0021H21	21 I 16 UN

Thread	Core dimension	Required tool	Required indexable insert
1 1/16x18UNEF	25.62	SR0021H21	21 I 18 UN
1 1/16x20UN	25.76	SR0021H21	21 I 20 UN
1 1/16x28UN	26.11	SR0017H14	14 I 28 UN
1 1/8x10UNS	26.10	SR0021H21	21 I 10 UN
1 1/8x12UNF	26.52	SR0021H21	21 I 12 UN
1 1/8x14UNS	26.82	SR0021H21	21 I 14 UN
1 1/8x16UN	27.03	SR0021H21	21 I 16 UN
1 1/8xUNEF	27.22	SR0021H21	21 I 18 UN
1 1/8x20UN	27.34	SR0021H21	21 I 20 UN
1 1/8x24UNS	27.56	SR0021H21	21 I 24 UN
1 1/8x28UN	27.70	SR0017H14	14 I 28 UN
1 3/16x12UN	28.09	SR0021H21	21 I 12 UN
1 3/16x16UN	28.63	SR0021H21	21 I 16 UN
1 3/16x18UNEF	28.79	SR0021H21	21 I 18 UN
1 3/16x20UN	28.93	SR0021H21	21 I 20 UN
1 3/16x28UN	29.29	SR0017H14	14 I 28 UN
1 1/4x10UNS	29.27	SR0021H21	21 I 10 UN
1 1/4x12UNF	29.69	SR0021H21	21 I 12 UN
1 1/4x14UNS	29.98	SR0021H21	21 I 14 UN
1 1/4x16UN	30.20	SR0021H21	21 I 16 UN
1 1/4x18UNEF	30.39	SR0021H21	21 I 18 UN
1 1/4x20UN	30.52	SR0021H21	21 I 20 UN
1 1/4x24UNS	30.73	SR0021H21	21 I 24 UN
1 1/4x28UN	30.87	SR0017H14	14 I 28 UN
1 5/16x12UN	31.27	SR0021H21	21 I 12 UN
1 5/16x16UN	31.80	SR0021H21	21 I 16 UN
1 5/16x18UNEF	31.97	SR0021H21	21 I 18 UN
1 5/16x20UN	32.11	SR0021H21	21 I 20 UN
1 5/16x28UN	32.46	SR0017H14	14 I 28 UN
1 3/8x10UNS	32.45	SR0021H21	21 I 10 UN
1 3/8x12UNF	32.87	SR0021H21	21 I 12 UN
1 3/8x14UNS	33.17	SR0021H21	21 I 14 UN
1 3/8x16UN	33.38	SR0029J30	30 I 16 UN
1 3/8x18UNEF	33.57	SR0029J30	30 I 18 UN
1 3/8x20UN	33.69	SR0029J30	30 I 20 UN
1 3/8x24UNS	33.91	SR0029J30	30 I 24 UN
1 3/8x28UN	34.05	SR0017H14	14 I 28 UN
1 7/16x8UN	33.39	SR0029J30	30 I 8 UN
1 7/16x12UN	34.44	SR0029J30	30 I 12 UN
1 7/16x16UN	34.98	SR0029J30	30 I 16 UN
1 7/16x18UNEF	35.14	SR0029J30	30 I 18 UN
1 7/16x20UN	35.28	SR0029J30	30 I 20 UN
1 7/16x28UN	35.64	SR0017H14	14 I 28 UN
1 1/2x8UN	34.99	SR0029J30	30 I 8 UN
1 1/2x10UNS	35.62	SR0029J30	30 I 10 UN
1 1/2x12UNF	36.04	SR0029J30	30 I 12 UN
1 1/2x14UNS	36.33	SR0029J30	30 I 14 UN
1 1/2x16UN	36.55	SR0029J30	30 I 16 UN
1 1/2x18UNEF	36.73	SR0029J30	30 I 18 UN
1 1/2x20UN	36.87	SR0029J30	30 I 20 UN
1 1/2x24UNS	37.08	SR0021H21	21 I 24 UN
1 1/2x28UN	37.22	SR0017H14	14 I 28 UN
1 9/16x6UN	35.50	SR0029J30	30 I 6 UN
1 9/16x12UN	37.62	SR0029J30	30 I 12 UN
1 9/16x16UN	38.15	SR0029J30	30 I 16 UN
1 9/16x18UNEF	38.32	SR0029J30	30 I 18 UN
1 9/16x20UN	38.46	SR0029J30	30 I 20 UN
1 5/8x8UN	38.16	SR0029J30	30 I 8 UN
1 5/8x10UNS	38.80	SR0029J30	30 I 10 UN
1 5/8x12UN	39.22	SR0029J30	30 I 12 UN
1 5/8x14UNS	39.52	SR0029J30	30 I 14 UN
1 5/8x16UN	39.73	SR0029J30	30 I 16 UN
1 5/8x18UNEF	39.92	SR0029J30	30 I 18 UN
1 5/8x20UN	40.04	SR0029J30	30 I 20 UN
1 5/8x24UNS	40.26	SR0021H21	21 I 24 UN
1 11/16x6UN	38.67	SR0029J30	30 I 6 UN
1 11/16x8UN	39.74	SR0029J30	30 I 8 UN
1 11/16x12UN	40.79	SR0029J30	30 I 12 UN
1 11/16x16UN	41.33	SR0029J30	30 I 16 UN
1 11/16x18UNEF	41.49	SR0029J30	30 I 18 UN
1 11/16x20UN	41.63	SR0029J30	30 I 20 UN
1 3/4x6UN	40.26	SR0029J30	30 I 6 UN
1 3/4x8UN	41.34	SR0029J30	30 I 8 UN
1 3/4x10UNS	41.97	SR0029J30	30 I 10 UN
1 3/4x12UN	42.39	SR0029J30	30 I 12 UN
1 3/4x14UNS	42.68	SR0029J30	30 I 14 UN
1 3/4x16UN	42.90	SR0029J30	30 I 16 UN
1 3/4x18UNS	43.09	SR0029J30	30 I 18 UN
1 3/4x20UN	43.22	SR0029J30	30 I 20 UN
1 13/16x6UN	41.85	SR0029J30	30 I 6 UN
1 13/16x8UN	42.91	SR0029J30	30 I 8 UN
1 13/16x12UN	43.97	SR0029J30	30 I 12 UN
1 13/16x16UN	44.50	SR0029J30	30 I 16 UN

## UN internal thread (continued)

Thread	Core dimension	Required tool	Required indexable insert
1 13/16x20UN	44.81	SR0029J30	30 120 UN
1 7/8x6UN	43.43	SR0029J30	30 16 UN
1 7/8x8UN	44.51	SR0029J30	30 18 UN
1 7/8x10UNS	45.15	SR0029J30	30 110 UN
1 7/8x12UN	45.57	SR0029J30	30 112 UN
1 7/8x14UNS	45.87	SR0029J30	30 114 UN
1 7/8x16UN	46.08	SR0029J30	30 116 UN
1 7/8x18UNS	46.27	SR0029J30	30 118 UN
1 7/8x20UN	46.39	SR0029J30	30 120 UN
1 15/16x6UN	45.02	SR0029J30	30 16 UN
1 15/16x8UN	46.09	SR0029J30	30 18 UN
1 15/16x12UN	47.14	SR0029J30	30 112 UN
1 15/16x16UN	47.68	SR0029J30	30 116 UN
1 15/16x20UN	47.98	SR0029J30	30 120 UN
2x6UN	46.61	SR0029J30	30 16 UN
2x8UN	47.69	SR0029J30	30 18 UN
2x10UNS	48.32	SR0029J30	30 110 UN
2x12UN	48.74	SR0029J30	30 112 UN
2x14UNS	49.03	SR0029J30	30 114 UN
2x16UN	49.25	SR0029J30	30 116 UN
2x18UNS	49.44	SR0029J30	30 118 UN
2x20UN	49.57	SR0029J30	30 120 UN
2 1/16x16 UNS	50.85	SR0029J30	30 116 UN
2 1/8x6UN	49.78	SR0029J30	30 16 UN
2 1/8x8UN	50.86	SR0029J30	30 18 UN
2 1/8x12UN	51.92	SR0029J30	30 112 UN
2 1/8x16UN	52.43	SR0029J30	30 116 UN
2 1/8x20UN	52.74	SR0029J30	30 120 UN
2 3/16x16UNS	54.03	SR0029J30	30 116 UN
2 1/4x6UN	52.96	SR0048M40	40 16 UN
2 1/4x8UN	54.04	SR0048M40	40 18 UN
2 1/4x10UNS	54.67	SR0048M40	40 110 UN
2 1/4x12UN	55.09	SR0048M40	40 112 UN
2 1/4x14 UNS	55.38	SR0048M40	40 114 UN
2 1/4x16UN	55.60	SR0029J30	30 116 UN
2 1/4x18UNS	55.79	SR0029J30	30 118 UN
2 1/4x20UN	55.92	SR0029J30	30 120 UN
2 5/16x16UN	57.20	SR0029J30	30 116 UN
2 3/8x6UN	56.15	SR0048M40	40 16 UN
2 3/8x8UN	57.21	SR0048M40	40 18 UN

## NPTF internal thread

Thread	Core dimension	Required tool	Required indexable insert
1/8x27NPT	8.33	MTB 08076 C10 27NPT*	—
1/4x18NPT	10.74	SR0009H12	12-18 NPT
3/8x18NPT	14.27	SR0012F14	14-18 NPT
1/2x14NPT	17.50	SR0014H14	14-14NPT
3/4x14NPT	22.81	SR0017H14	14-14NPT
1x11.5NPT	28.65	SR0021H21	21-11.5 NPT
1 1/4x11.5NPT	37.39	SR0029J30	30-11.5 NPT
1 1/2x11.5NPT	43.46	SR0029J30	30-11.5 NPT
2x11.5NPT	55.25	SR0029J30	30-11.5 NPT
2 1/2x8NPT	65.96	SR0048M40	40-8 NPT
3x8NPT	81.74	SR0048M40	40-8 NPT
3 1/2x8NPT	94.36	SR0048M40	40-8 NPT
4x8NPT	106.96	SR0048M40	40-8 NPT

\* = Solid carbide milling cutter

## NPTF fine internal thread

Thread	Core dimension	Required tool	Required indexable insert
1/8x27NPTF	8.33	MTB 08076 C10 27 NPTF*	—
1/4x18NPTF	10.74	SR0009H12	12-18 NPTF
3/8x18NPTF	14.27	SR0012F14	14-18 NPTF
1/2x14NPTF	17.50	SR0014H14	14-14NPTF
3/4x14NPTF	22.81	SR0017H14	14-14NPTF
1x11.5NPTF	28.65	SR0021H21	21-11.5 NPTF
1 1/4x11.5NPTF	37.39	SR0029J30	30-11.5 NPTF
1 1/2x11.5NPTF	43.46	SR0029J30	30-11.5 NPTF
2x11.5NPTF	55.25	SR0029J30	30-11.5 NPTF
2 1/2x8NPTF	65.96	SR0048M40	40-8 NPTF
3x8NPTF	81.74	SR0048M40	40-8 NPTF
3 1/2x8NPTF	94.36	SR0048M40	40-8 NPTF
4x8NPTF	106.96	SR0048M40	40-8 NPTF

\* = Solid carbide milling cutter

## Whitworth pipe thread, straight internal thread BSP

Thread	Core dimension	Required tool	Required indexable insert
1/8x28BSP	8.60	MTB 08078 C14 28W*	-
1/4x19BSP	11.50	SR0009H12	12-19W
3/8x19BSP	15.10	SR0012F14	14-19W
1/2x14BSP	18.80	SR0014H14	14-14W
3/4x14BSP	24.20	SR0017H14	14-14W
1x11BSP	30.50	SR0021H21	21-11W
1 1/4x11BSP	39.10	SR0029J30	30-11W
1 1/2x11BSP	45.00	SR0029J30	30-11W
2x11BSP	56.80	SR0029J30	30-11W
2 1/2x11BSP	72.40	SR0048M40	40-11W
3x11BSP	85.10	SR0048M40	40-11W
3 1/2x11BSP	97.50	SR0048M40	40-11W
4x11BSP	110.20	SR0048M40	40-11W
5x11BSP	135.60	SR0048M40	40-11W
6x11BSP	161.00	SR0048M40	40-11W

\* = Solid carbide milling cutter

## Whitworth pipe thread, conical internal thread BSPT

Thread	Core dimension	Required tool	Required indexable insert
1/8x28BSPT	8.60	MTB 08078 C14 28BSPT*	—
1/4x19BSPT	11.50	SR0009H12	12-19BSPT
3/8x19BSPT	15.10	SR0012F14	14-19BSPT
1/2x14BSPT	18.80	SR0014H14	14-14BSPT
3/4x14BSPT	24.20	SR0017H14	14-14BSPT
1x11BSPT	30.50	SR0021H21	21-11BSPT
1 1/4x11BSPT	39.10	SR0029J30	30-11BSPT
1 1/2x11BSPT	45.00	SR0029J30	30-11BSPT
2x11BSPT	56.80	SR0029J30	30-11BSPT
2 1/2x11BSPT	72.40	SR0048M40	40-11BSPT
3x11BSPT	85.10	SR0048M40	40-11BSPT
3 1/2x11BSPT	97.50	SR0048M40	40-11BSPT
4x11BSPT	110.20	SR0048M40	40-11BSPT
5x11BSPT	135.60	SR0048M40	40-11BSPT
6x11BSPT	161.00	SR0048M40	40-11BSPT

\* = Solid carbide milling cutter

## PG internal thread DIN 40430

Thread	Core dimension	Required tool	Required indexable insert
PG 9	13.86	SR0012F14	14-18 PG
PG 11	17.26	SR0014H14	14-18 PG
PG 13.5	19.06	SR0014H14	14-18 PG
PG 16	21.16	SR0017H14	14-18 PG
PG 21	26.78	SR0021H21	21-16 PG
PG 29	35.48	SR0021H21	21-16 PG
PG 36	45.48	SR0021H21	21-16 PG
PG 42	52.48	SR0021H21	21-16 PG
PG 48	57.78	SR0021H21	21-16 PG



## SARA® ATORN® Thread end milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

258002.... 258027....  
258003.... 258028....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz mm/tooth								
						Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø30
P	Machining steel	Up to 700	9 SMn 28	1.0715	100-250	0.04	0.06	0.07	0.08	0.09	0.12	0.15	0.18	0.21
	Unalloyed structural steel	Up to 700	St-52	1.0052	110 - 180	0.03	0.05	0.06	0.07	0.08	0.1	0.12	0.15	0.18
	Cast steel	Up to 950	GS 40	1.0416	130 - 170	0.03	0.03	0.04	0.05	0.05	0.07	0.08	0.1	0.11
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	90 - 160	0.03	0.03	0.04	0.05	0.05	0.07	0.08	0.1	0.11
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110 - 170	0.03	0.03	0.04	0.05	0.05	0.07	0.08	0.1	0.11
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	70 - 150	0.04	0.06	0.07	0.08	0.09	0.12	0.15	0.18	0.21
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	160 - 300	0.04	0.06	0.07	0.08	0.09	0.12	0.15	0.18	0.21
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	160 - 300	0.04	0.06	0.07	0.08	0.09	0.12	0.15	0.18	0.21
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 50	0.03	0.03	0.03	0.04	0.05	0.06	0.07	0.08	0.08
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 50	0.03	0.03	0.03	0.04	0.05	0.06	0.07	0.08	0.08

## SARA® ATORN® Thread milling cutter, for small bore holes



• Please adjust these guideline values according to clamping operation and machine set-up!

258010.... 258025....  
258022.... 258026....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz mm/tooth					
						Ø1.5	Ø2	Ø3	Ø4	Ø5	Ø6
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 120	0.05	0.05	0.07	0.09	0.11	0.13
	Unalloyed structural steel	Up to 700	St-52	1.0052	60 - 90	0.04	0.05	0.06	0.08	0.09	0.1
	Cast steel	Up to 950	GS 40	1.0416	70 - 90	0.04	0.04	0.05	0.05	0.06	0.07
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	50 - 80	0.04	0.04	0.05	0.05	0.06	0.07
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	60 - 90	0.03	0.03	0.04	0.05	0.06	0.06
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	40 - 80	0.05	0.05	0.07	0.09	0.11	0.13
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	50 - 200	0.1	0.11	0.12	0.14	0.16	0.18
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	50 - 200	0.1	0.11	0.12	0.14	0.16	0.18
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 40	0.03	0.03	0.04	0.04	0.05	0.06
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 40	0.03	0.03	0.04	0.04	0.05	0.06

## SARA® ATORN® Thread milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

258011....

• **Programming code note:** Anticlockwise spindle rotation Code MO4

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz mm/tooth															
						Ø1	Ø1.5	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	Ø16		
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	60 - 70	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.1	0.11		
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	50 - 60	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.09	0.1		
	Hardened materials up to 64 HRC		T00Cr6	1.2067	40 - 50	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.08	0.09		

## ATORN® Drilling and thread milling cutter DMT



• Please adjust these guideline values according to clamping operation and machine set-up!

258100....

• **Programming code note:** Anticlockwise spindle rotation Code MO4

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						4	5	6	8	9	10	12
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 120	0.03	0.05	0.03	0.04	0.05	0.05	0.05
	Unalloyed structural steel	Up to 700	St-52	1.0052	60 - 90	0.02	0.02	0.03	0.04	0.04	0.04	0.05
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	50 - 80	0.02	0.02	0.02	0.02	0.03	0.03	0.04
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	70 - 100	0.02	0.02	0.02	0.02	0.03	0.03	0.03
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	60 - 90	0.02	0.02	0.02	0.02	0.03	0.03	0.03 - 0.04
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	40 - 80	0.03	0.03	0.04	0.05	0.05	0.05	0.05
	Ductile iron	Up to 280 HB	GGG 60	0.7060	40 - 80	0.03	0.03	0.04	0.05	0.05	0.05	0.05
N	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	100 - 200	0.03	0.03	0.04	0.05	0.05	0.05	0.05
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	60-140	0.02	0.02	0.02	0.02	0.03	0.03	0.03
	Thermoset		Melamine		50 - 200	0.04	0.05	0.05	0.06	0.06	0.06	0.06

## ATORN® Cutting data recommendations thread milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

258050 ....

258052 ....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
						≤ 4	≤ 9	> 9
P	Structural steel	700 - 950	Ck45	1.1191	50 - 140	0.005 - 0.03	0.01 - 0.05	0.02 - 0.1
	Tempering steel	500 - 950	42 CrMo4	1.7225	60 - 130	0.005 - 0.02	0.01 - 0.04	0.02 - 0.09
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	40 - 120	0.005 - 0.02	0.01 - 0.04	0.02 - 0.09
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	70 - 120	0.005 - 0.03	0.01 - 0.05	0.02 - 0.1
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	50-120	0.005 - 0.03	0.01 - 0.05	0.02 - 0.1
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	130 - 250	0.005 - 0.04	0.01 - 0.06	0.02 - 0.13
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 180	0.005 - 0.04	0.01 - 0.06	0.02 - 0.13
	Thermoset		Melamine		80 - 180	0.005 - 0.04	0.01 - 0.06	0.02 - 0.13
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 80	0.005 - 0.02	0.01 - 0.04	0.02 - 0.09

## 1-cut thread milling cutter AT-1



• Please adjust these guideline values according to clamping operation and machine set-up!

294300....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 160	0,01 - 0,05
	Structural steel	700 - 950	Ck45	1.1191	80 - 160	0,01 - 0,05
	Tempering steel	500 - 950	42 CrMo4	1.7225	80 - 160	0,01 - 0,05
	Cast steel	Up to 950	GS 40	1.0416	60 - 120	0,01 - 0,05
	Tempering steel	950 -1300	43CrMo4	1.3563	80 - 120	0,01 - 0,05
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	60 - 120	0,01 - 0,05
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60 - 120	0,01 - 0,05
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	80 - 160	0,01 - 0,05
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	60 - 120	0,01 - 0,05
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	100 - 300	0,03 - 0,1
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	80 - 160	0,03 - 0,1
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	80 - 160	0,03 - 0,1
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	80 - 160	0,03 - 0,1
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	80 - 160	0,03 - 0,1
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	80 - 160	0,03 - 0,1
	Thermoplastic		PVC		80 - 160	0,03 - 0,1

## ATORN® Thread milling inserts

**ATORN thread milling cutters are specially designed for use on CNC milling machines and machining centres which have 3-axis control with helical interpolation.**

259001 ....  
259002 ....  
259003 ....

### Advantages and application

- External and internal threads
- For through-hole and blind bore threads
- Synchronous and up-cut milling and change of the axial feed direction enables production of straight and conical threads and of all standard thread variants
- Thread production with varying tolerances
- Optimal clamping
- Short chips
- Low cutting pressure

### Carbide quality AMT7

- TiAlN-coated ultra-fine grain quality
- for universal applications in all materials at medium to high cutting speeds

ISO		Cutting speed Vc m/min	Feed f mm/rev
P	Carbon steel	115 - 280	0.05 - 0.15
	Alloyed steel	130 - 280	
	High-alloy steel	105 - 180	
	Cast steel	150 - 190	
M	Stainless steel	130 - 190	
K	Grey cast iron	80 - 170	
N	Non-ferrous metals, aluminium	180 - 34	



## CNC Programming for internal threads

Upwards milling operation  
(Programme is for use on CNC machining centres)

$$A = (D_0 - D) / 2$$

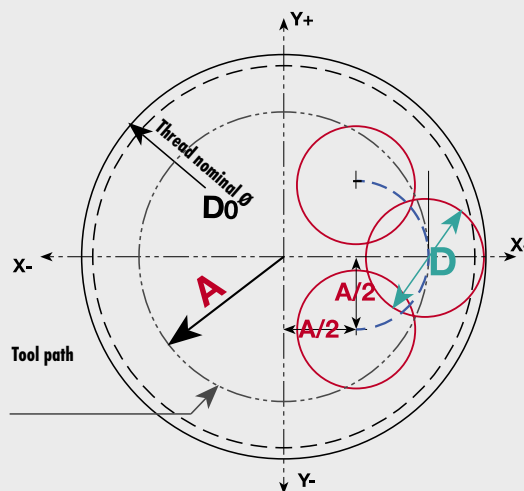
A = radius of the tool path  
D<sub>0</sub> = thread nominal Ø  
D = cutting Ø

### Standard Programming

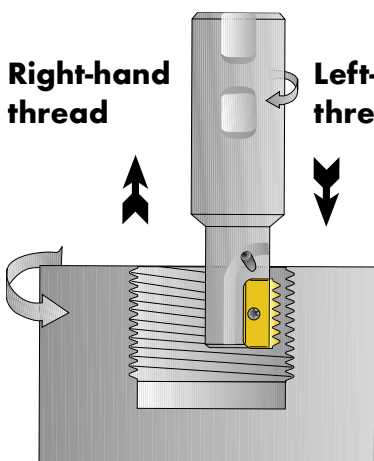
```
G90 G00 G54 G43 H1X0 Y0 Z10 S--
G00 Z-(thread depth)
G01 G91 G41 D1 X(A/2) Y(A/2) Z0 F--
G03 X(A/2) Y(A/2) R(A/2) Z(1/8 x pitch)
G03 X0 Y0 I(A) J0 Z(Steigung)
G03 X-(A/2) Y(A/2) R(A/2) Z(1/8 x pitch)
G01 G40 X-(A/2) Y-(A/2) Z0
G90 X0 Y0 Z0
```

### Example

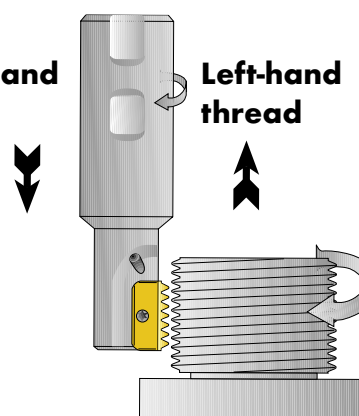
M32 x 2 (thread depth 18 mm)  
Tool holder: SR0021 H21  
(Cutting Ø 21 mm)  
Insert: 21 I 2,0 ISO  
A = (32 - 21) / 2 = 5.5  
produces the following Programming:  
G90 G00 G54 G43 H1X0 Y0 Z10 S2800  
G00 Z-18  
G01 G91 G41 X2.75 Y2.75 Z0 F85 D1  
G03 X2.75 Y2.75 R2.75 Z0.25  
G03 X0 Y0 I-5.5 J0 Z2  
G03 X-2.75 Y2.75 R2.75 Z0.25  
G01 G40 X-2.75 Y-2.75 Z0  
G90 G0 X0 Y0 Z0



### Internal thread



### External thread





**ATORN® Exchangeable head milling cutter Z4**

• Please adjust these guideline values according to clamping operation and machine set-up!

255600....

ISO	Side ae = 0.5 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.075	0.075	0.1	0.12
	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.075	0.075	0.1	0.12
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	170	0.075	0.075	0.1	0.12
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160	0.075	0.075	0.1	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	110	0.052	0.052	0.07	0.084
	Cast steel	Up to 950	GS 40	1.0416	150	0.052	0.052	0.07	0.084
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	75	0.052	0.052	0.07	0.084
K	Grey cast iron	100 - 400	GG 25	0.6025	190	0.075	0.075	0.1	0.12
	Ductile iron	400 - 800	GGG 60	0.7060	140	0.075	0.075	0.1	0.12
	Malleable cast iron	350 - 700	GTS 55	0.8155	140	0.075	0.075	0.1	0.12

**ATORN® Exchangeable head roughing cutter NRZ**

• Please adjust these guideline values according to clamping operation and machine set-up!

255601....  
255602....

ISO	Side ae = 0.5 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.075	0.075	0.1	0.12
	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.075	0.075	0.1	0.12
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	170	0.075	0.075	0.1	0.12
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	150	0.052	0.052	0.07	0.084
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	110	0.052	0.052	0.07	0.084
	Cast steel	Up to 950	GS 40	1.0416	130	0.052	0.052	0.07	0.084
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	90	0.075	0.075	0.1	0.12
K	Grey cast iron	100 - 400	GG 25	0.6025	170	0.075	0.075	0.1	0.12
	Ductile iron	400 - 800	GGG 60	0.7060	120	0.075	0.075	0.1	0.12
	Malleable cast iron	350 - 700	GTS 55	0.8155	120	0.075	0.075	0.1	0.12

**ATORN® Exchangeable head milling cutter Z3 Type W**

• Please adjust these guideline values according to clamping operation and machine set-up!

255603....

ISO	Side ae = 0.5 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400	0.065	0.065	0.085	0.11
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	350	0.065	0.065	0.085	0.11
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	160	0.05	0.05	0.075	0.09
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	160	0.05	0.05	0.075	0.09
	Thermoplastic	40 - 70	PVC, acrylic glass		450	0.065	0.065	0.085	0.11



## ATORN® Exchangeable head milling cutter Z2/Z3/Z4

• Please adjust these guideline values according to clamping operation and machine set-up!

255604....

255605....

255606....

ISO	Side $a_e = 0.1 \times D$ $a_p = 0.6 \times D$	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
	Materials group								
P	Unalloyed structural steel	Up to 700	St-52	1.0052	220	0.12	0.12	0.16	0.2
	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.084	0.084	0.11	0.14
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	195	0.084	0.084	0.11	0.14
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	190	0.084	0.084	0.11	0.14
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	155	0.06	0.06	0.08	0.1
	Cast steel	Up to 950	GS 40	1.0416	175	0.06	0.06	0.08	0.1
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.084	0.084	0.11	0.14
K	Grey cast iron	100 - 400	GG 25	0.6025	180	0.084	0.084	0.11	0.14
	Ductile iron	400 - 800	GGG 60	0.7060	140	0.084	0.084	0.11	0.14
	Malleable cast iron	350 - 700	GTS 55	0.8155	150	0.084	0.084	0.11	0.14
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	250	0.084	0.084	0.11	0.14
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	300	0.084	0.084	0.11	0.14
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	200	0.084	0.084	0.11	0.14
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	200	0.084	0.084	0.11	0.14
	Thermoplastic	40 - 70	PVC, acrylic glass		200	0.084	0.084	0.11	0.14

## ATORN® Exchangeable head milling cutter, multi-flute

• Please adjust these guideline values according to clamping operation and machine set-up!



255607....

ISO	Side $a_e = 0.3 \times D$ $a_p = 0.6 \times D$	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
	Materials group								
P	Unalloyed structural steel	Up to 700	St-52	1.0052	220	0.065	0.065	0.075	0.1
	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.065	0.065	0.075	0.1
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	180	0.065	0.065	0.075	0.1
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160	0.065	0.065	0.075	0.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	90	0.045	0.045	0.053	0.07
	Cast steel	Up to 950	GS 40	1.0416	120	0.045	0.045	0.053	0.07
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.045	0.045	0.053	0.07
K	Grey cast iron	100 - 400	GG 25	0.6025	200	0.065	0.065	0.075	0.1
	Ductile iron	400 - 800	GGG 60	0.7060	170	0.065	0.065	0.075	0.1
	Malleable cast iron	350 - 700	GTS 55	0.8155	170	0.065	0.065	0.075	0.1
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	200	0.065	0.065	0.075	0.1
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	200	0.065	0.065	0.075	0.1

### Over 200,000 tools available online!

#### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com

## ATORN® Exchangeable head milling cutter, torus type H



255608....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Grooving ae = 0.1 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	194	0.074	0.074	0.089	0.111
	Machining steel	Up to 700	9 SMn 28	1.0715	189	0.074	0.074	0.089	0.111
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	183	0.074	0.074	0.089	0.111
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	181	0.074	0.074	0.089	0.111
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	137	0.074	0.074	0.089	0.111
	Cast steel	Up to 950	GS 40	1.0416	175	0.074	0.074	0.089	0.111
K	Grey cast iron	100 - 400	GG 25	0.6025	178	0.074	0.074	0.089	0.111
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	162	0.074	0.074	0.089	0.111
	Ductile iron	400 - 800	GGG 60	0.7060	162	0.074	0.074	0.089	0.111
H	Hardened steel	45-50 HRc			107	0.074	0.074	0.089	0.111
	Hardened steel	50-60 HRc			60	0.074	0.074	0.089	0.111
	Hardened steel	60-70 HRc			52	0.074	0.074	0.089	0.111

ISO	Side ae = 0.03 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	355	0.1	0.1	0.12	0.15
	Machining steel	Up to 700	9 SMn 28	1.0715	345	0.1	0.1	0.12	0.15
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	335	0.1	0.1	0.12	0.15
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	330	0.1	0.1	0.12	0.15
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	320	0.1	0.1	0.12	0.15
	Cast steel	Up to 950	GS 40	1.0416	320	0.1	0.1	0.12	0.15
K	Grey cast iron	100 - 400	GG 25	0.6025	325	0.1	0.1	0.12	0.15
	Ductile iron	400 - 800	GGG 60	0.7060	295	0.1	0.1	0.12	0.15
	Malleable cast iron	350 - 700	GTS 55	0.8155	295	0.1	0.1	0.12	0.15
H	Hardened steel	45-50 HRc			195	0.1	0.1	0.12	0.15
	Hardened steel	50-60 HRc			110	0.1	0.1	0.12	0.15
	Hardened steel	60-70 HRc			95	0.1	0.1	0.12	0.15



... precise and powerful.

Multiple clamping ...

**ATORN®**  
Performance demands quality

**ATORN® Exchangeable head milling cutter, torus type H-N**

255609....

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Side ae = 1 x D ap = 0.1 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0.2	0.2	0.25	0.3
	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.2	0.2	0.25	0.3
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	150	0.2	0.2	0.25	0.3
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	140	0.2	0.2	0.25	0.3
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120	0.2	0.2	0.25	0.3
	Cast steel	Up to 950	GS 40	1.0416	130	0.2	0.2	0.25	0.3
K	Grey cast iron	100 - 400	GG 25	0.6025	180	0.2	0.2	0.25	0.3
	Ductile iron	400 - 800	GGG 60	0.7060	150	0.2	0.2	0.25	0.3
	Malleable cast iron	350 - 700	GTS 55	0.8155	150	0.2	0.2	0.25	0.3
H	Hardened steel	45-50 HRc			95	0.15	0.15	0.2	0.25
	Hardened steel	50-60 HRc			70	0.09	0.09	0.12	0.15
	Hardened steel	60-70 HRc			60	0.08	0.08	0.09	0.12

**ATORN® Exchangeable head milling cutter, radius Z2**

255610....

255611....

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Grooving ae = 0.3 x D ap = 0.03 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	570	0.065	0.065	0.09	0.12
	Machining steel	Up to 700	9 SMn 28	1.0715	450	0.065	0.065	0.09	0.12
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	390	0.065	0.065	0.09	0.12
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	350	0.065	0.065	0.09	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	240	0.045	0.045	0.06	0.08
	Cast steel	Up to 950	GS 40	1.0416	300	0.065	0.065	0.09	0.12
K	Grey cast iron	100 - 400	GG 25	0.6025	400	0.065	0.065	0.09	0.12
	Ductile iron	400 - 800	GGG 60	0.7060	380	0.065	0.065	0.09	0.12
	Malleable cast iron	350 - 700	GTS 55	0.8155	380	0.065	0.065	0.09	0.12
H	Hardened steel	45-50 HRc			180	0.045	0.045	0.06	0.08
	Hardened steel	50-60 HRc			160	0.045	0.045	0.06	0.08
	Hardened steel	60-70 HRc			150	0.045	0.045	0.06	0.08

**ATORN® Exchangeable head milling cutter, radius Z2 220°**

255612....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Side ae = 0.3 x D ap = 0.03 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	450	0.065	0.065	0.09	0.1
	Machining steel	Up to 700	9 SMn 28	1.0715	350	0.065	0.065	0.09	0.1
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	305	0.065	0.065	0.09	0.1
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	310	0.065	0.065	0.09	0.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	170	0.045	0.045	0.055	0.65
	Cast steel	Up to 950	GS 40	1.0416	250	0.065	0.065	0.09	0.1
K	Grey cast iron	100 - 400	GG 25	0.6025	450	0.065	0.065	0.09	0.1
	Ductile iron	400 - 800	GGG 60	0.7060	410	0.065	0.065	0.09	0.1
	Malleable cast iron	350 - 700	GTS 55	0.8155	410	0.065	0.065	0.09	0.1
H	Hardened steel	45-50 HRc			120	0.045	0.045	0.055	0.65
	Hardened steel	50-60 HRc			90	0.045	0.045	0.055	0.65
	Hardened steel	60-70 HRc			70	0.045	0.045	0.055	0.65

**ATORN® Exchangeable head milling cutter Multimill**

255613....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Side ae = 0.3 x D ap = 0.5 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	120	0.045	0.065	0.08	0.09
	Machining steel	Up to 700	9 SMn 28	1.0715	105	0.045	0.065	0.08	0.09
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	95	0.045	0.065	0.08	0.09
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	90	0.045	0.065	0.08	0.09
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	65	0.03	0.045	0.06	0.07
	Cast steel	Up to 950	GS 40	1.0416	80	0.045	0.065	0.08	0.09
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.03	0.045	0.06	0.07
K	Grey cast iron	100 - 400	GG 25	0.6025	120	0.045	0.065	0.08	0.09
	Ductile iron	400 - 800	GGG 60	0.7060	90	0.045	0.065	0.08	0.09
	Malleable cast iron	350 - 700	GTS 55	0.8155	60	0.045	0.065	0.08	0.09
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	300	0.045	0.065	0.08	0.09
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	280	0.045	0.065	0.08	0.09
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	200	0.045	0.065	0.08	0.09
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	200	0.045	0.065	0.08	0.09

**ATORN® Exchangeable head deburring milling cutter**

255614....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Side ae = 0.3 x D ap = 0.5 x D Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.085	0.113	0.141	0.169
	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.085	0.113	0.141	0.169
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	170	0.085	0.113	0.141	0.169
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	120	0.044	0.05	0.075	0.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	160	0.063	0.075	0.1	0.125
	Cast steel	Up to 950	GS 40	1.0416	120	0.044	0.05	0.075	0.1
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	110	0.038	0.044	0.063	0.075
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	75	0.031	0.038	0.056	0.075
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	75	0.031	0.038	0.056	0.075
K	Grey cast iron	100 - 400	GG 25	0.6025	150	0.05	0.056	0.075	0.1
	Ductile iron	400 - 800	GGG 60	0.7060	100	0.07	0.085	0.113	0.144
	Malleable cast iron	350 - 700	GTS 55	0.8155	70	0.07	0.085	0.113	0.144
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	700	0.05	0.063	0.081	0.106
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	500	0.085	0.113	0.141	0.169
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	300	0.085	0.113	0.141	0.169
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	300	0.085	0.113	0.141	0.169

**ATORN® Exchangeable head quadrant milling cutter**

255615....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Side $a_e = 0.1 \times D$ $a_p = 0.1 \times D$ Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed V <sub>c</sub> m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.012	0.015	0.025	0.032
	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.012	0.015	0.025	0.032
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	160	0.012	0.015	0.025	0.032
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	140	0.012	0.015	0.025	0.032
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	80	0.012	0.015	0.025	0.032
	Cast steel	Up to 950	GS 40	1.0416	100	0.012	0.015	0.025	0.032
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	110	0.012	0.015	0.025	0.032
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	75	0.012	0.015	0.025	0.032
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	75	0.012	0.015	0.025	0.032
K	Grey cast iron	100 - 400	GG 25	0.6025	150	0.012	0.015	0.025	0.032
	Ductile iron	400 - 800	GGG 60	0.7060	100	0.012	0.015	0.025	0.032
	Malleable cast iron	350 - 700	GTS 55	0.8155	70	0.012	0.015	0.025	0.032
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	600	0.012	0.015	0.025	0.032
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	500	0.012	0.015	0.025	0.032
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	300	0.012	0.015	0.025	0.032
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	300	0.012	0.015	0.025	0.032

EVEN WORKS **BACKWARDS.**

SIMPLY INPUT THE DIMENSIONS, AND

**YOU'RE DONE:**  
CLAMPING JAWS FINDER

THAT'S POWER TO PRODUCE

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE



## ATORN® Tool system for machining drill holes MINI-MILL



• Please adjust these guideline values according to clamping operation and machine set-up!

263001 - 263111....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm	
						Drill cutting	Thread milling
P	Unalloyed structural steel	Up to 700	St-52	1.0052	120 - 200	0.2 - 0.4	0.15 - 0.25
	Tempering steel	500 - 950	42 CrMo4	1.7225	80 - 160	0.15 - 0.3	0.15 - 0.25
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	100 - 180	0.15 - 0.3	0.15 - 0.25
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	120 - 200	0.15 - 0.3	0.15 - 0.25
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 150	0.1 - 0.25	0.15 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	100 - 170	0.2 - 0.4	0.2 - 0.3
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	120	0.2 - 0.4	0.2 - 0.3
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	80-120	0.2 - 0.4	0.2 - 0.3
N	Al. alloy short-chipping	Up to 500	G-ALSi 12	3.2581	300 - 500	0.15 - 0.4	0.2 - 0.3
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	300 - 500	0.15 - 0.4	0.2 - 0.3
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	80 - 110	0.01 - 0.08	0.01 - 0.08

$$n = \frac{V_c \times 1000}{d \times \pi}$$

$$U_{eff} = f_z \times z \times n$$

Milling - external contour

$$U_{prog} = \frac{U_{eff} \times (D + d)}{D}$$

$$U_{eff} = \frac{D \times U_{prog}}{(D + d)}$$

Milling - internal contour

$$U_{prog} = \frac{U_{eff} \times (D - d)}{D}$$

$$U_{eff} = \frac{D \times U_{prog}}{(D - d)}$$

$$h_m = \sqrt{\frac{f_z}{a_e} \times \frac{d}{a_e}} \quad f_z = h_m \times \sqrt{\frac{d}{a_e}}$$

Average chip thickness  
h<sub>m</sub> > 0.05 mm/rev sought!

n = spindle speed  
V<sub>c</sub> = cutting speed  
d = milling cutter diameter  
D = thread diameter  
U<sub>eff</sub> = effective feed rate  
(at the contour)

rpm  
m/min.  
mm  
mm  
mm/min.

h<sub>m</sub> = average chip thickness  
U<sub>prog</sub> = programmed feed rate  
f<sub>z</sub> = feed per tooth  
z = jaw quantity of the cutter  
a<sub>e</sub> = radial clamp depth

mm/rev  
mm/min.  
mm/min.  
mm  
mm



## ATORN® Cutting inserts CMT



• Please adjust these guideline values according to clamping operation and machine set-up!

266100 - 266109....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						Ø 10	Ø 12	Ø 18	Ø 25
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 120	0.16	0.17	0.2	0.22
	Unalloyed structural steel	Up to 700	St-52	1.0052	60 - 90	0.14	0.16	0.2	0.22
	Tempering steel	500 - 950	42 CrMo4	1.7225	50 - 80	0.1	0.12	0.16	0.18
	Cast steel	Up to 950	GS 40	1.0416	70 - 90	0.1	0.12	0.15	0.18
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	70 - 100	0.1	0.11	0.15	0.17
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	60 - 90	0.1	0.11	0.15	0.17
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	40 - 80	0.16	0.17	0.2	0.22
	Ductile iron	Up to 280 HB	GGG 60	0.7060	40 - 80	0.16	0.17	0.2	0.22
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	40 - 80	0.16	0.17	0.2	0.22
N	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	50 - 200	0.19	0.19	0.22	0.24
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	60-140	0.1	0.11	0.16	0.18
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	50 - 200	0.19	0.19	0.22	0.24
	Fibre-reinforced plastics		CFRP, GFRP		50 - 200	0.19	0.19	0.22	0.24
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 40	0.07	0.07	0.1	0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 40	0.07	0.07	0.1	0.12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	50 - 70	0.08 - 0.09	0.08 - 0.09	0.12	0.14

**ATORN® Face milling cutter 45°**

262555....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Indexable insert SN..X 1206 ANN... ap max. 5.0 mm		Indexable insert SNMU 1260 ANER... ap max. 5.0 mm		Indexable insert ONMU 1505 ANN... ap max. 0.5-3.0 mm		Carbide Type
					Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth	
P	Unalloyed structural steel	Up to 700	St-52	1.0052	150 - 300	0.10 - 0.30	110 - 200	0.05 - 0.25	100 - 170	0.05 - 0.25	HC 4630
	Machining steel	Up to 700	9 SMn 28	1.0715							
	Unalloyed tempered steel	500 - 950	Ck45	1.1191							
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131							
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343							
M	Cast steel	Up to 950	GS 40	1.0416	90 - 160	0.10 - 0.35	90 - 170	0.05 - 0.25	90 - 160	0.05 - 0.25	HC 4535
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301							
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104							
K	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	120-180	0.10 - 0.40	200 - 300	0.05 - 0.25	200 - 300	0.05 - 0.25	HC 4410
	Grey cast iron	100 - 400	GG 25	0.6025							
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678							
	Ductile iron	400 - 800	GGG 60	0.7060							
N	Malleable cast iron	350 - 700	GTS 55	0.8155	180 - 350	0.10 - 0.20					HW 4310
	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535							
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581							
	Copper alloy long-chipping	300 - 700	MS 63	2.0320							
	Copper alloy short-chipping	Up to 500	MS 58	2.0402							

**SARA® Smooth-running face milling cutter 45°**

262550....

- Indexable cutting insert SEMT 13T3 AGSN-PM, ap max. 6 mm
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz mm/tooth	Carbide type of the indexable cutting insert used
P	Machining steel	Up to 700	9 SMn 28	1.0715	200 - 300	0.1 - 0.3	JC 5040 (JC 8050)
	Unalloyed structural steel	Up to 700	St-52	1.0052			
	Structural steel	700 - 950	Ck45	1.1191			
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131			
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343			
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	170 - 250	0.1 - 0.3	JC 8050 (JC 8015)
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301			
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 250	0.1 - 0.3	JC 605W (JC 8015)
	Ductile iron	Up to 280 HB	GGG 60	0.7060			
H	Hardened materials up to 60 HRC		X15CrMoV12	1.2379	60 - 100	0.1 - 0.2	JC 8015

**ATORN® Face milling cutter 45°**

260150....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Vc m/min	Max. tooth feed rate fz in mm with ae = 0.75 x d1 (d1 = milling cutter diameter)	Suitable indexable insert
			SAHT 1306 <sup>2)</sup>	
M	Acid-resistant stainless steel, ferritic, martensitic 500-950 N/mm <sup>2</sup>	140 - 170	0.30	HC4540 HC4640
	Acid-resistant stainless steel, austenitic 500-950 N/mm <sup>2</sup>	200 - 280 60 - 120 <sup>1)</sup>	0.25	
	Machining steel 500 - 950 N/mm <sup>2</sup>	180 - 240 60 - 120 <sup>1)</sup>	0.25	
K	Cast iron with lamellar graphite 100-400 N/mm <sup>2</sup>	200 - 260	0.40	HC4410
	Alloyed cast iron 150-250 N/mm <sup>2</sup>	160 - 200	0.30	
	Cast iron with spheroidal graphite 400-800 N/mm <sup>2</sup>	140 - 180	0.35	
	Alloyed cast iron 350-700 N/mm <sup>2</sup>	160 - 200	0.35	
N	Aluminium alloys, long-chipping up to 550 N/mm <sup>2</sup>	300 - 1000	0.40	HC4640
	Copper alloys, long-chipping 300-700 N/mm <sup>2</sup>	250 - 500	0.40	
S	Titanium alloys, medium-strength up to 950 N/mm <sup>2</sup>	40 - 80 <sup>1)</sup>	0.15	HC4640
	Titanium alloys, high-strength 900-1400 N/mm <sup>2</sup>	30 - 40 <sup>1)</sup>	0.15	

<sup>1)</sup> Cutting data for wet chipping

<sup>2)</sup> The fz values related to the cutting depths for ap = 3 mm (SAHT 1306)

**palbit**  **Face milling cutter 45° PLUS 91245**


260211....

- $ae = 0,7 \times D$
- PH5... = Cooling: air or emulsion
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz in mm/tooth	Cutting speed Vc m/min			
						◀ Wear resistance			Toughness ▶
						PH5705	PH7920	PH5740	PH7740
						++	±	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,15 - 0,4		180 - 320		160 - 240
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,15 - 0,4		150 - 240		140 - 200
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,15 - 0,4		140 - 200		120 - 170
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,1 - 0,3				110 - 160
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,1 - 0,3				90 - 140
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,1 - 0,3				80 - 120
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,15 - 0,4	170 - 305		150 - 260	
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,14 - 0,4	180 - 350		155 - 290	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,14 - 0,4	130 - 210		115 - 180	
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,1 - 0,17				20 - 55

Usage conditions: ++ = good ± = average -- = difficult

**palbit**  **Face milling cutter 45° LINEPRO 09945**

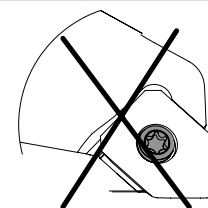
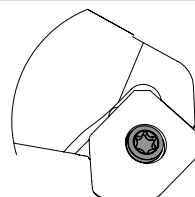

260213....

- $ae = 0,7 \times D$
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz in mm/tooth	Cutting speed Vc m/min		
						◀ Wear resistance		Toughness ▶
						PH0910	PH6920	PH6740
						++	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,1 - 0,3		150 - 230	130 - 160
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,1 - 0,3		140 - 220	120 - 150
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,1 - 0,3		130 - 180	100 - 130
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,1 - 0,2			100 - 120
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,1 - 0,2			80 - 110
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,1 - 0,2			70 - 100
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,1 - 0,25		150 - 280	130 - 250
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,1 - 0,25		130 - 230	110 - 220
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,1 - 0,2		80 - 190	80 - 170
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	3.3535	0,1 - 0,2	350 - 1400		

Usage conditions: ++ = good ± = average -- = difficult

Cutting data Wiper indexable cutting insert  
 $F_w = 1,4 \times F_n$  ( $F_n = F_z \times Z$ )



## ATORN® Face and copy milling cutter, OCKX, XCKX, RCKX 1606 and SAHT 1306



Please adjust these guideline values according to clamping operation and machine set-up!

260111....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth	Carbide Type
P	Machining steel	Up to 700	9 SMn 28	1.0715	135 - 180 120 - 300	0.1 - 0.35	HC 4540 HC 4620
	Unalloyed structural steel	Up to 700	St-52	1.0052			
	Structural steel	700 - 950	Ck45	1.1191			
	Cast steel	Up to 950	GS 40	1.0416			
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131			
M	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	180 - 240	0.1 - 0.35	HC 4540
	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006			
K	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	50-120 160 - 300	0.1 - 0.35	HC 4410 HC 4620
	Grey cast iron	Up to 260 HB	GG 25	0.6025			
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678			
	Ductile iron	Up to 280 HB	GGS 60	0.7060			
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155			

## ATORN® Shoulder milling cutter 90°



Please adjust these guideline values according to clamping operation and machine set-up!

262547.... 283310....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth		
						Finishing	Medium machining	Roughing
P	Machining steel	Up to 700	9 SMn 28	1.0715	220 - 250	0.1	0.2	0.3
	Unalloyed structural steel	Up to 700	St-52	1.0052	220 - 250	0.1	0.2	0.3
	Structural steel	700 - 950	Ck45	1.1191	220 - 250	0.1	0.2	0.3
	Cast steel	Up to 950	GS 40	1.0416	220 - 250	0.1	0.2	0.3
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	160 - 200	0.08	0.15	0.2
M	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	160 - 200	0.08	0.15	0.2
	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	130 - 140	0.06	0.12	0.2
K	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	130 - 140	0.06	0.12	0.2
	Grey cast iron	Up to 260 HB	GG 25	0.6025	140 - 200	0.12	0.25	0.35
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	140 - 180	0.1	0.2	0.3
	Ductile iron	Up to 280 HB	GGS 60	0.7060	140 - 180	0.1	0.2	0.3
S	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140 - 200	0.12	0.25	0.35
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40 - 60	0.05	0.08	0.12

ae/D	50 - 100%	30%	20%	10%	5%	2%
Factor	1	1.2	1.5	2.1	3	4.8

## ATORN® Roughing spiral flute end milling cutter 90°



Please adjust these guideline values according to clamping operation and machine set-up!

262544....

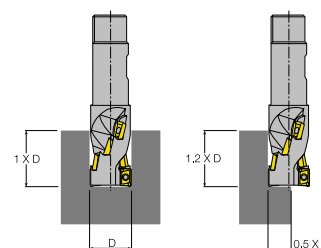
Subsequent cutting conditions must be regarded as guideline values.

Various factors can influence these values:

- Rigidity of the machine
- Workpiece clamping
- Material

A= Groove milling:  
B= shoulder milling:

A<sub>p</sub> (axial cutting depth) up to 1 x milling cutter diameter  
A<sub>e</sub> (radial cutting depth) up to 0.5 x milling cutter diameter and  
A<sub>p</sub> (axial cutting depth) up to 1.2 x milling cutter diameter



ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Hardness Brinell	Carbide type	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth			
								Ø 20 + Ø 25		Ø 32 + Ø 40	
								A	B	A	B
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 200	DC325M	110 - 200	0.08 - 0.15	0.08 - 0.18	0.1 - 0.2	0.1 - 0.25
						DC735	110 - 175				
	Tempering steel	500 - 950	42 CrMo4	1.7225	125 - 275	DC325M	90 - 135	0.08 - 0.15	0.08 - 0.18	0.1 - 0.2	0.1 - 0.25
						DC735	90 - 125				
Tempering steel	950 - 1300	43CrMo4	1.3563	275 - 325	DCM325M	80-100	0.07 - 0.15	0.07 - 0.18	0.08 - 0.2	0.08 - 0.25	
					DC735	80 - 90					
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	175 - 275	DC325M	90 - 150	0.08 - 0.15	0.08 - 0.18	0.1 - 0.2	0.1 - 0.25
						DC735	90 - 160				
Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	135 - 175	DC325M	100 - 130	0.08 - 0.15	0.08 - 0.18	0.1 - 0.2	0.1 - 0.25	
					DC725	100 - 110					
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	140 - 200	DC210	85 - 105	0.08 - 0.2	0.1 - 0.25	0.1 - 0.25	0.1 - 0.3
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	110 - 250	DC210	55 - 85	0.07 - 0.18	0.08 - 0.2	0.08 - 0.23	0.1 - 0.27
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535		DC210	250 - 450	0.12 - 0.23	0.11 - 0.28	0.13 - 0.28	0.15 - 0.35

## ATORN® 4-10 Power / 4-15 Power



• Please adjust these guideline values according to clamping operation and machine set-up!

262559.... 262562....  
262560.... 262563....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth	Carbide type	Indexable inserts designation
P	Machining steel	Up to 700	9 SMn 28	1.0715	100 - 300	0.1 - 0.3	HC 4630	LNMx 10../15.. PNR-MM
	Unalloyed structural steel	Up to 700	St-52	1.0052				
	Structural steel	700 - 950	Ck45	1.1191				
	Cast steel	Up to 950	GS 40	1.0416				
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131				
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343				
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	120-180	0.05 - 0.25	HC 4535	LNMx 10../15.. PNR-MM
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301				
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120 - 300	0.08 - 0.25	HC 4410	LNMx 10../15.. PNR-MM
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678				
	Ductile iron	Up to 280 HB	GGG 60	0.7060				
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155				
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	200 - 300	0.1 - 0.3	HW 4310	LNMx 10../15.. PNR-MA
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581				
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250				
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381				

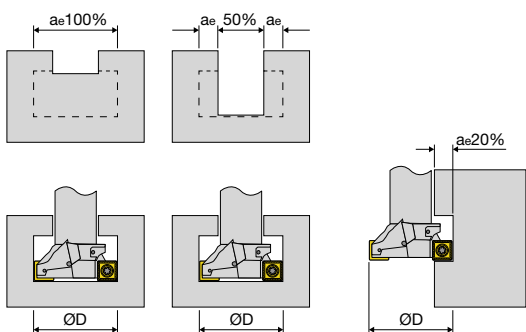
## SARA® T-slot milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

263007.... 263008....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm		
						21 - 25	32 - 40	50
P	Unalloyed structural steel	Up to 700	St-52	1.0052	250	0.1	0.12	0.16
	Structural steel	700 - 950	Ck45	1.1191	200	0.08	0.09	0.1
	Tempering steel	500 - 950	42 CrMo4	1.7225	170	0.08	0.06	0.08
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	170	0.08	0.06	0.08
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	200	0.06	0.06	0.06
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.12	0.16	0.18
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0.1	0.12	0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	200	0.08	0.08	0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.06	0.06	0.06
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.06	0.06	0.06
ap max. [mm]						9 - 11	14 - 17	21



ae/D	100%	50%	20%	10%
Vc	100%	90%	80%	70%
X	1	1	1.3	1.5

The cutting speed Vc must be reduced for decreasing contact width ae/D.  
The feed per cutting edge fz must be corrected by factor X.

## ATORN® High feed-rate milling cutter XDM..



• Please adjust these guideline values according to clamping operation and machine set-up!

286001..../286002....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth		Cutting speed Vc m/min	Feed fz in mm/tooth	
						HC4640			HC4410	
						XDMW 0903SR	XDMT 0903ER		XDMW 0903SR	XDMT 0903ER
P	Machining steel	Up to 700	9 SMn 28	1.0715	200 - 260	1.7	1.4	260 - 270	1.5	1.3
	Unalloyed structural steel	Up to 700	St-52	1.0052	200 - 260	1.7	1.4	260 - 270	1.5	1.3
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	150-180	1.4	1.2	160 - 190	1.3	1.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	160 - 210	1.2	1.0	180 - 220	1.2	1.0
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	200 - 240		0.9			
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	200 - 240		0.9			
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678				180 - 200	1.0	
	Ductile iron	Up to 280 HB	GGG 60	0.7060				200 - 240	1.0	
H	Hardened materials up to 55 HRC		X40Cr14	1.2083				100	1.0	
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379				80	0.7	
	Hardened materials up to 64 HRC		100Cr6	1.2067				70	0.4	

# ATORN® High feed-rate milling cutter



• Please adjust these guideline values according to clamping operation and machine set-up!

285001.... 285003.... 285005....  
285002.... 285004.... 285006....

ISO	ae = 0.7 x D	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						HC4640					
						XCNT07 SN-TR XCNW07 SN	XCNT09 SN-TR XCNW12 SN	XCNT12 SN-TR XCNW07 SN	XCNT07 EN-TR	XCNT09 EN-TR	XCNT12 EN-TR
P	Unalloyed structural steel	Up to 700	St-52	1.0052	200-260	2.0	2.5	3.0	1.4	1.7	2.0
	Machining steel	Up to 700	9 SMn 28	1.0715	210-250	2.0	2.5	3.0	1.4	1.7	2.0
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	180-220	2.0	2.5	3.0	1.4	1.7	2.0
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	140-180	2.0	2.5	3.0	1.4	1.7	2.0
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	220-260	0.8	1.2	1.5	0.8	1.2	1.5
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	220-260	1.0	1.5	1.8	1.0	1.5	1.8
K	Grey cast iron	100 - 400	GG 25	0.6025	200-260	1.5	2.0	2.5	1.2	1.6	2.0
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	160-200	1.5	2.0	2.5	1.2	1.6	2.0
	Ductile iron	400 - 800	GGG 60	0.7060	200-240	1.5	2.0	2.5	1.0	1.4	1.7
	Malleable cast iron	350 - 700	GTS 55	0.8155	160-200	1.1	1.3	1.5	0.7	0.9	1.0

ISO	ae = 0.7 x D	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
						HC4410		
						XCNT07 SN-TR XCNW07 SN	XCNT09 SN-TR XCNW12 SN	XCNT12 SN-TR XCNW07 SN
P	Unalloyed structural steel	Up to 700	St-52	1.0052	240-300	1.6	2.0	2.4
	Machining steel	Up to 700	9 SMn 28	1.0715	240-300	1.6	2.0	2.4
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	220-280	1.6	2.0	2.4
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	180-240	1.6	2.0	2.4
K	Grey cast iron	100 - 400	GG 25	0.6025	200-260	1.5	2.0	1.2
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	160-200	1.5	2.0	1.2
	Ductile iron	400 - 800	GGG 60	0.7060	200-240	1.5	2.0	2.5
	Malleable cast iron	350 - 700	GTS 55	0.8155	160-200	1.1	1.3	1.5



## Deburring tool Orbitool® for internal machining



250010.... 250011....

### 1. Rotational speed rpm

The tool rotates in a clockwise direction. The higher the rotational speed, the more material is removed. Limiting factors include the rotational speed of the machine spindle and the desired surface quality. The recommended rotational speed for ORBITOOL® DEBURRING TOOLS is between 2000 and 8000 rpm.

A lower rotational speed reduces vibrations and produces a better finish. Harder materials require higher rotational speeds.

### 2. Feed rate

The feed rate determines the material removal rate and the form of the cutting edges of the intersecting boreholes. For softer materials, e.g. aluminium, smaller feed rates produce chamfers instead of a radius. Feed rates of 0.05 to 0.6 mm per circular motion of the tool are recommended.

### 3. Rotational speed of the circular motion

There are three options for moving ORBITOOL® DEBURRING TOOLS in the workpiece bore:

Recommended rotational speed range for the circular motion: 20 - 100 min<sup>-1</sup>

The circular motion diameter calculation is:

$$D = Dh - Ds$$

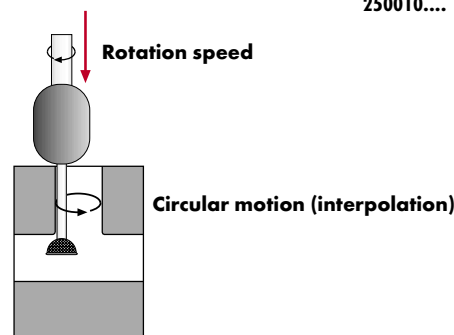
D = diameter of the circular motion

Dh = diameter of the bore

D = ORBITOOL® DEBURRING TOOL end milling cutter diameter

### Note

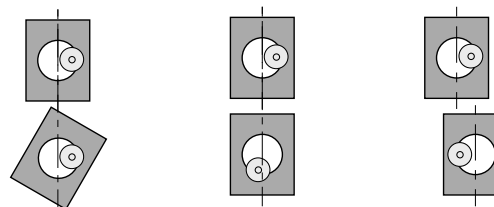
The abrasion capacity of the tool increases with the stiffness of the tool clamping. The flexibility of the tool shank allows almost universal application. However, if the shank lengths of the ORBITOOL® DEBURRING TOOL are too short, particularly with smaller shank diameters, this may cause permanent deformation of the tool shank. For delicate machining processes, sensitive surfaces or insufficient shank lengths, a flexible spacer (optional) can be used to remedy this. Threaded bores can also be easily deburred. The protective disc of the milling tool protects the thread profile from damage.




rotating tool,  
rotating workpiece

rotating workpiece,  
screwing motion,  
stationary workpiece

rotating workpiece,  
workpiece moving  
on X and Y axis





**palbit**  **High feed-rate milling cutter HIFEED 6410**



- $ae = 0,7 \times D$
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260218...  
260219...

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz/tooth	Cutting speed Vc m/min				
						◀ Wear resistance				Toughness ▶
						PH7910	PH7920	PH7930	PH7740	PHM740
						++	±	±	--	--
P	Unalloyed structural steel	Up to 700	St52	1.0052	0,4 - 1,8	160 - 280	150 - 230	140 - 220	100 - 180	
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,4 - 1,8	150 - 230	140 - 220	130 - 180	90 - 170	
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,3 - 1,5	140 - 190	130 - 180	100 - 170	80 - 140	
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,4 - 1,3			130 - 220	100 - 180	100 - 180
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,4 - 1,3			120 - 180	90 - 150	90 - 150
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,1 - 1,0			70 - 140	70 - 120	70 - 120
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,5 - 1,8	160 - 350	150 - 310			
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,5 - 1,8	150 - 300	140 - 260			
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,5 - 1,5	120 - 360	100 - 220			
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,4 - 1,0			35 - 65	25 - 60	25 - 60

Usage conditions: ++ = good ± = average -- = difficult

**Ramping and helical plunge milling**

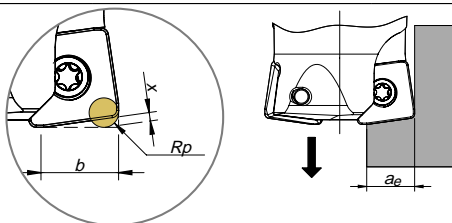
ØDc	Ramping			Helical plunge milling		
	α°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
20	15	1	3,2	26,4	-	6 17
25	9,5	1	6,0	36,4	-	5 12
32	5,5	1	10,4	50,4	-	5 9
35	4,5	1	12,7	56,4	-	5 8
42	3,5	1	16,3	70,4	-	5 7

**Plunging**

L ≤ 3Dc	L > 3Dc	S max.
fz (mm/z)		
0,08 - 0,15	0,05 - 0,1	$S \max. = \sqrt{Dc \times DR - DR^2}$

S max. and DR (depending on diameter Dc)						
DR	Dc					
	20	25	32	35	42	
1	4,4	4,9	5,6	5,8	6,4	
2	6,0	6,8	7,7	8,1	8,9	
3	7,1	8,1	9,3	9,8	10,8	
4	8,0	9,2	10,6	11,1	12,3	
5	8,7	10	11,6	12,2	13,6	
6	9,2	10,7	12,5	13,2	14,7	

Programming



Indexable cutting inserts	Rp	X	b	ae
SO...0803..	2,0	0,8	6,8	6,3

**palbit** High feed-rate milling cutter HIFEED 06690



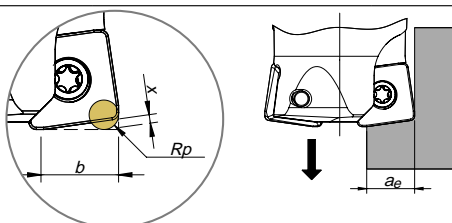
- ae = 0,7 x D
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260221....  
260220....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz/tooth	Cutting speed Vc m/min				
						◀ Wear resistance				Toughness ▶
						PH7910	PH7920	PH7930	PH7740	PHM740
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,5 - 2,0	160 - 280	150 - 230	140 - 220	100 - 180	
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,5 - 2,0	150 - 230	140 - 220	130 - 180	90 - 170	
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,5 - 1,8	140 - 190	130 - 180	100 - 170	80 - 140	
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,5 - 1,8			130 - 220	100 - 180	100 - 180
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,5 - 1,8			120 - 180	90 - 150	90 - 150
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,5 - 1,8			70 - 140	70 - 120	70 - 120
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,5 - 2,0	160 - 350	150 - 310		120 - 240	
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,5 - 2,0	150 - 300	140 - 260		100 - 200	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,5 - 1,8	120 - 260	100 - 220		80 - 150	
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,4 - 1,3			35 - 65	25 - 60	25 - 60

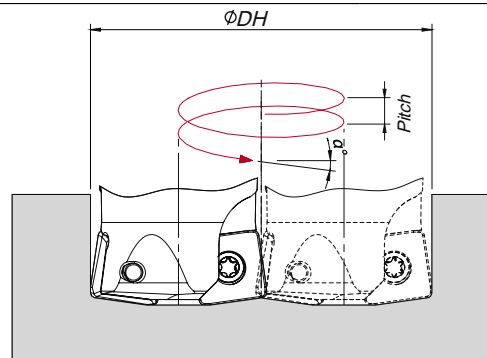
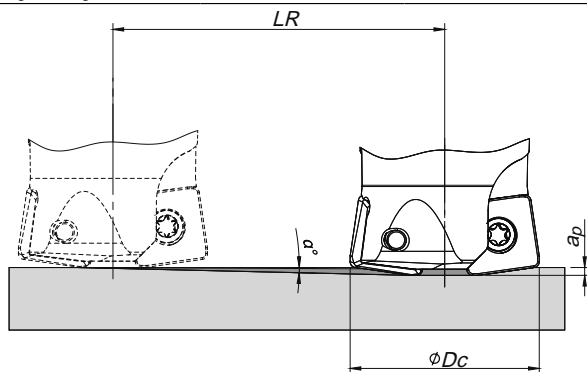
Usage conditions: ++ = good ± = average -- = difficult

Programming

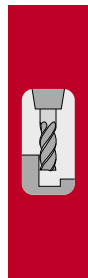


Indexable cutting inserts	Rp	X	b	ae
SO...13M5..	2,5	1,1	10,5	10,0

**Ramping and helical plunge milling**

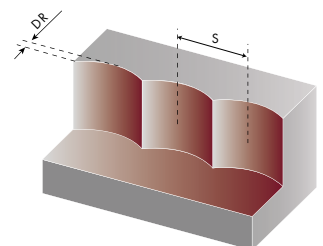


$\phi D_c$	Ramping			Helical plunge milling		
	$\alpha^\circ$	$a_p$ max.	LR min.	$\phi DH$ min.	$\phi DH$ max.	Pitch max. / U
32	10	1,5	6	43	-	6
				-	62	16
35	9	1,5	9,5	49	-	6
				-	68	16
42	6,4	1,5	13,4	63	-	7
				-	82	14
50	4,3	1,5	19,9	79	-	6
				-	98	11
52	4	1,5	21,5	83	-	6
				-	102	10
63	3	1,5	28,6	105	-	6
				-	124	10
66	2,6	1,5	33	111	-	6
				-	130	9
80	2	1,5	43	139	-	6
				-	158	8



**Plunging**

$L \leq 3D_c$	$L > 3D_c$	S max.
$f_z$ (mm/z)		
0,1 - 0,2	0,07 - 0,14	$S \max. = \sqrt{D_c \times DR - DR^2}$



S max. and DR (depending on diameter Dc)

DR	Dc							
	32	35	42	50	52	63	66	80
1	5,6	5,8	6,4	7,0	7,1	7,9	8,1	8,9
2	7,7	8,1	8,9	9,8	10,0	11,0	11,3	12,5
3	9,3	9,8	10,8	11,9	12,1	13,4	13,7	15,2
4	10,6	11,1	12,3	13,6	13,9	15,4	15,7	17,4
5	11,6	12,2	13,6	15,0	15,3	17,0	17,5	19,4
6	12,5	13,2	14,7	16,2	16,6	18,5	19,0	21,1
7	13,2	14,0	15,7	17,3	17,7	19,8	20,3	22,6
8	13,9	14,7	16,5	18,3	18,8	21,0	21,5	24,0
9	14,4	15,3	17,2	19,2	19,7	22,0	22,6	25,3
10	14,8	15,8	17,9	20,2	20,5	23,0	23,7	26,5

**palbit**  High feed-rate milling cutter LINEPRO 20090



- $ae = 0,7 \times D$
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

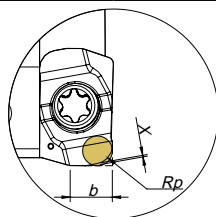
260240...  
260239...

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz/tooth			Cutting speed Vc m/min	
								◀ Wear resistance	Toughness ▶
					PH7920	PH7930	XPET 06...LP	XPET 06...HF	XPHW 06...MH
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,05 - 0,07	0,4 - 0,8	0,05 - 0,12	180 - 240	160 - 220
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,05 - 0,07	0,4 - 0,8	0,05 - 0,12	170 - 250	150 - 230
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,05 - 0,07	0,4 - 0,6	0,05 - 0,12	160 - 210	140 - 190
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,05 - 0,07	0,4 - 0,8			130 - 220
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,05 - 0,07	0,4 - 0,6			120 - 180
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,05 - 0,07	0,4 - 0,6			70 - 140
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,05 - 0,07	0,4 - 0,8		160 - 350	160 - 350
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,05 - 0,07	0,4 - 0,8		150 - 320	150 - 300
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,05 - 0,07	0,4 - 0,8		130 - 280	120 - 260
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,05 - 0,07	0,4 - 0,6			35 - 65

Usage conditions: ++ = good ± = average -- = difficult

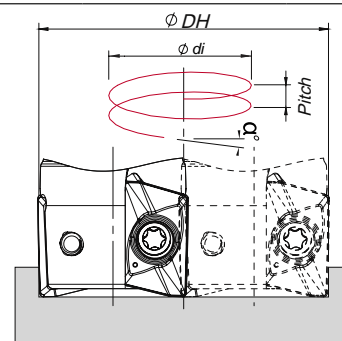
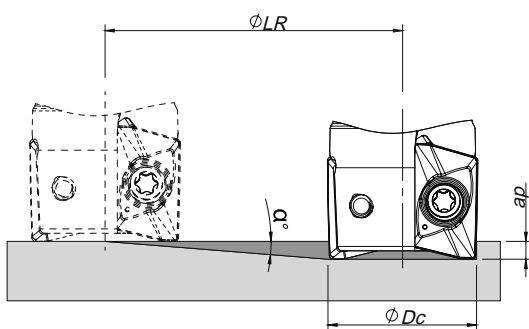
	ae	Vc	fz	ap mm
Grooving	100%	< 20%	< 20%	1 - 3
Side milling	< 50%	> 8%	> 8%	1 - 4
	≤ 25%	> 12%	> 12%	1 - 4

**Programming**



Indexable cutting inserts	Rp	X	b
XPET 05 HF	1,1	0,84	2,3

**Ramping and helical plunge milling**



ØDc	Ramping			Helical plunge milling		
	α°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
10	5,5	4	41,5	17,2	-	2,2 2,5
12	4,0	4	57,2	21,2	-	2,0 2,3
16	2,5	4	91,6	29,2	-	1,8 2,0
17	2,2	4	104,1	31,2	-	1,7 1,9
20	1,9	4	120,6	37,2	-	1,8 1,9
21	1,6	4	143,2	39,2	-	1,6 1,7
25	1,3	4	171,0	47,2	-	1,6 1,7
32	1,0	4	229,2	61,2	-	1,6 1,7

**palbit**  High feed-rate milling cutter LINEPRO 20190


- $ae = 0,7 \times D$
- PH5... = Cooling: air or emulsion
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

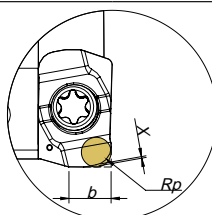
260243...  
260242...  
260241...

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min						
					◀ Wear resistance ▶						Toughness ▶
					PH7603	PH0910	PH5705	PH7920	PH7930	PH 5740	PHS740
P	Unalloyed structural steel	Up to 700	St-52	1.0052	200 - 260			160 - 220	140 - 200		120 - 150
	Tempering steel	500 - 950	42 CrMo4	1.7225	190 - 270			150 - 230	130 - 180		110 - 170
	Tempering steel	950 - 1300	43CrMo4	1.3563	180 - 230			140 - 190	100 - 170		100 - 130
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006					130 - 220		
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301					120 - 180		
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462					70 - 140		
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155			160 - 390	160 - 350	140 - 260	120 - 240	
	Grey cast iron	Up to 260 HB	GG 25	0.6025			150 - 320	150 - 300	130 - 220	110 - 200	
	Ductile iron	Up to 280 HB	GGG 60	0.7060			120 - 260	120 - 260	100 - 180	90 - 170	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535		350 - 1.400					
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718					35 - 65		
H	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	120 - 230						

Usage conditions: ++ = good ± = average -- = difficult

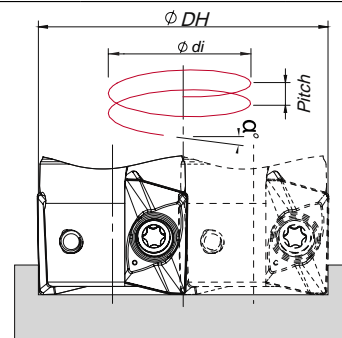
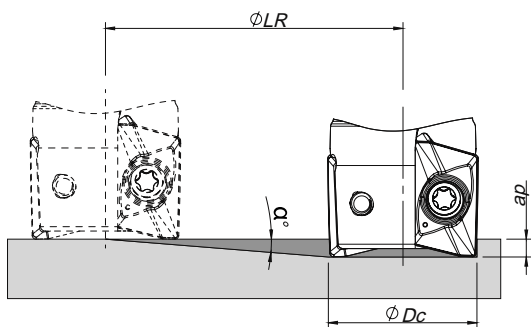
ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz/tooth				
					XPET 10..LP	XPET10..MP	XPET 10..LN	XPET..HF	XPHW 10..MH
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,08 - 0,2	0,10 - 0,25		0,4 - 0,8	0,1 - 0,25
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,08 - 0,2	0,10 - 0,2		0,4 - 0,8	0,1 - 0,25
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,08 - 0,15	0,10 - 0,2		0,4 - 0,6	0,1 - 0,25
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,08 - 0,2	0,10 - 0,2		0,4 - 0,7	
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,08 - 0,2	0,10 - 0,2		0,4 - 0,7	
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,08 - 0,15	0,10 - 0,2		0,4 - 0,6	
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,08 - 0,2	0,10 - 0,25		0,5 - 0,8	
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,08 - 0,2	0,10 - 0,25		0,5 - 0,8	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,08 - 0,2	0,10 - 0,2		0,5 - 0,6	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535			0,07 - 0,25		
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,05 - 0,07			0,4 - 0,6	
H	Hardened materials up to 60 HRC		X153CrMoV12	1.2379					0,08 - 0,15

	ae	Vc	fz	ap mm
Grooving	100%	< 20%	< 20%	2 - 4
Side milling	< 50%	> 8%	> 8%	3 - 6
	≤ 25%	> 12%	> 12%	7 - 9

**Programming**


Indexable cutting inserts	Rp	X	b
XPET 10 HF	1,6	0,33	3,45

Ramping and helical plunge milling



ØDc	Ramping			Helical plunge milling		
	α°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
16	7,5	10	76	27,6	-	4,8
					30,4	6,0
17	7	10	81,4	29,6	-	5,9
					32,4	5,9
20	5	10	114,3	35,6	-	4,3
					38,4	5,1
22	4,5	10	127,1	39,6	-	4,3
					42,4	5,0
25	3,5	10	163,5	45,6	-	4,0
					48,4	4,5
27	3	10	190,8	49,6	-	3,7
					52,4	4,2
32	2,5	10	229	59,6	-	3,8
					62,4	4,2
40	1,7	10	336,9	75,6	-	3,3
					78,4	3,6
50	1,3	10	440,7	95,6	-	3,2
					98,4	3,4
63	1	10	572,9	121,6	-	3,2
					124,4	3,4

palbit  High feed-rate milling cutter LINEPRO 20290

- ae = 0,7 x D
- PH5... = Cooling: air or emulsion
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!



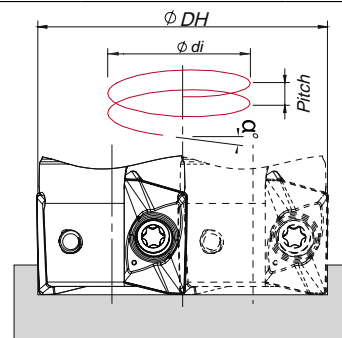
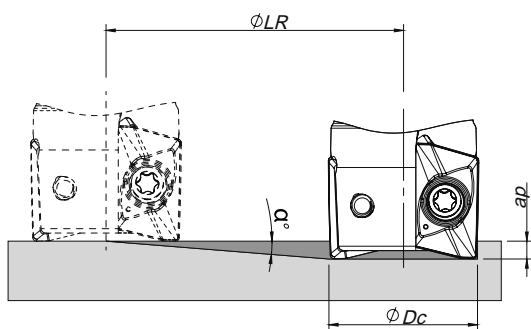
260245....  
260244....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz/tooth	Cutting speed Vc m/min					
						◀ Wear resistance			Toughness ▶		
						PH0910	PH5705	PH7920	PH5740	PH5740	PH7740
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,1 - 0,35			160 - 280		140 - 220	140 - 220
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,1 - 0,35			150 - 230		130 - 180	130 - 180
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,1 - 0,30			140 - 190		100 - 170	100 - 170
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,1 - 0,30						130 - 220
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,1 - 0,30						120 - 180
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,1 - 0,25						70 - 140
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,1 - 0,35		160 - 380	160 - 350	150 - 300		140 - 260
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,1 - 0,35		150 - 320	150 - 300	140 - 250		130 - 220
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,1 - 0,30		120 - 280	120 - 260	120 - 220		100 - 180
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	0,1 - 0,35	350 - 1.400					
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,1 - 0,20						30 - 65

Usage conditions: ++ = good ± = average -- = difficult



Ramping and helical plunge milling



$\phi Dc$	Ramping			Helical plunge milling		
	$\alpha^\circ$	$a_p$ max.	LR min.	$\phi DH$ min.	$\phi DH$ max.	Pitch max. / U
32	3,8	17	255,9	58,8	-	5,6 6,3
40	2,7	17	360,5	74,8	-	5,2 5,7
50	2,0	17	186,8	94,8	-	4,9 5,3
63	1,5	17	649,2	120,8	-	4,8 5,0
80	1,0	17	973,9	154,8	-	4,1 4,3
100	0,8	17	1.217,5	194,8	-	4,2 4,3
125	0,7	17	1.498,4	244,8	-	4,3 4,4



palbit High feed-rate milling cutter TETRAFEED



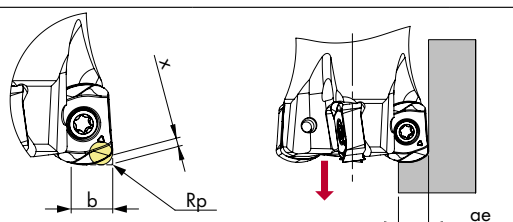
- $a_e = 0,7 \times D$
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260311...  
260312...  
260313...

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz/tooth	Cutting speed Vc m/min			
						◀ Wear resistance			Toughness ▶
						PHP920	PHP930	PHH930	PHS740
					XNKU 06..MP	±	±	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,05 - 1,50	180 - 250	160 - 230		160 - 230
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,05 - 1,50	170 - 210	150 - 190		150 - 190
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,05 - 1,50	160 - 200	140 - 180		140 - 180
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,05 - 1,40			130 - 170	120 - 180
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,05 - 1,40			100 - 160	100 - 150
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,05 - 1,40			80 - 140	70 - 130
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,05 - 1,50	180 - 320			160 - 300
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,05 - 1,50	170 - 280			150 - 260
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,05 - 1,50	100 - 240			80 - 220
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,05 - 1,30			30 - 75	30 - 70

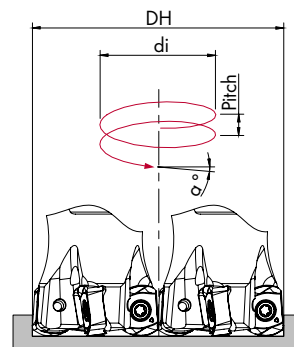
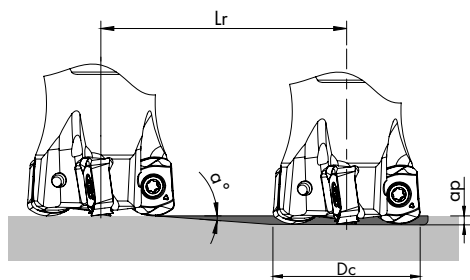
Usage conditions: ++ = good ± = average -- = difficult

Programming



Indexable cutting inserts	Rp	X	b	ae
XNKU 06T310-MP	1,8	0,4	3,6	3,4

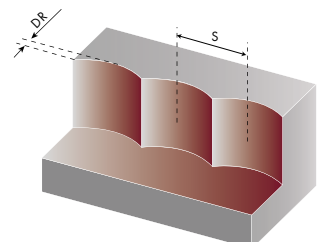
**Ramping and helical plunge milling**



ØDc	Ramping			Helical plunge milling		
	α°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
16	0,5	1	114,6	24,8 -	- 30,0	0,2 0,3
20	0,5	1	114,6	32,8 -	- 38,0	0,3 0,4
25	0,8	1	71,6	42,8 -	- 48,0	0,7 1,0
32	0,8	1	71,6	56,8 -	- 62,0	1,0 1,3
35	0,5	1	114,6	62,8 -	- 68,0	0,7 0,9
40	0,4	1	143,2	72,8 -	- 78,0	0,7 0,8
42	0,4	1	143,2	76,8 -	- 82,0	0,7 0,8
50	0,3	1	191,0	92,8 -	- 98,0	0,7 0,7
52	0,3	1	191,0	96,8 -	- 102,0	0,7 0,8
63	0,25	1	229,2	118,8 -	- 124,0	0,7 0,8

**Plunging**

L ≤ 3Dc	L > 3Dc	S max.
fz (mm/z)		
0,08 - 0,15	0,05 - 0,10	$S \max. = \sqrt{Dc \times DR - DR^2}$



S max. and DR (depending on diameter Dc)

DR mm	Dc mm XNKU 06..									
	16	20	25	32	40	50	63	80	100	125
1	3,9	4,4	4,9	5,6	5,8	6,2	6,4	7,0	7,1	7,9
2	5,3	6,0	6,8	7,7	8,1	8,7	8,9	9,8	10,0	11,0
3	6,2	7,1	8,1	9,3	9,8	10,5	10,8	11,9	12,1	13,4

**palbit**  **High feed-rate milling cutter ALUPRO 76090**



- $ae = 0,7 \times D$
- Please adjust these guideline values according to clamping operation and machine set-up!

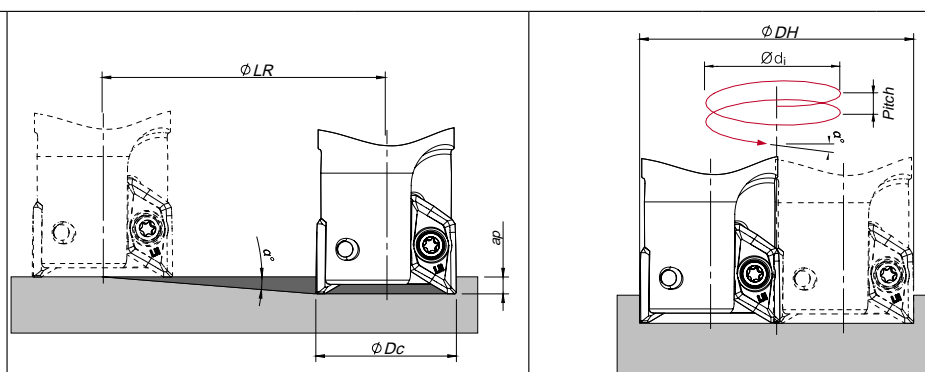
260250....  
260251....  
260252....  
260253....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Vc	Cutting width ae mm	Cutting depth ap mm	Feed fz/tooth
					m/min PH0910			
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 3.000	≤ 25% ØDc	≤ 5	0,35 - 0,40
							5 - 10	0,30 - 0,35
							10 - 15	0,25 - 0,30
						≤ 50% ØDc	≤ 5	0,35 - 0,40
							5 - 10	0,30 - 0,35
							10 - 15	0,25 - 0,30
						≤ 75% ØDc	≤ 5	0,30 - 0,35
							5 - 10	0,25 - 0,30
							10 - 15	0,20 - 0,25

**Permissible rotational speed**

ØDc	Ø20	Ø25	Ø32	Ø4	Ø50	Ø63	Ø80	Ø100
min <sup>-1</sup>	40.000	38.000	33.000	29.000	24.000	21.000	19.000	16.000

**Ramping and helical plunge milling**



Indexable cutting inserts - radius	ØDc	Ramping			Helical plunge milling		
		α°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
≤ 3,2 mm	20	23	15	35,3	36,2 -	- 38,4	21,6 24,5
	25	21	15	39,1	46,2 -	- 48,4	25,6 28,2
	32	15	15	56,0	60,2 -	- 62,4	23,7 25,6
	40	10	15	85,1	76,2 -	- 78,4	20,0 21,3
	50	8	15	106,7	96,2 -	- 98,4	20,4 21,4
	63	6	15	142,7	122,2 -	- 124,4	19,5 20,3
	80	4	15	214,5	156,2 -	- 158,4	16,7 17,2
	100	2,5	15	343,6	196,2 -	- 198,4	13,2 13,5
≥ 4,0 mm	20	23	13	37,1	36,2 -	- 38,4	18,5 21,0
	25	21	13	40,3	46,2 -	- 48,4	22,3 24,6
	32	15	13	56,2	60,2 -	- 62,4	21,3 22,9
	40	10	13	90,3	76,2 -	- 78,4	17,0 18,0
	50	8	13	109,9	96,2 -	- 98,4	17,8 18,7
	63	6	13	140,2	122,2 -	- 124,4	17,9 18,6
	80	4	13	220,7	156,2 -	- 158,4	14,6 15,1
	100	2,5	13	309,2	196,2 -	- 198,4	13,2 13,5

## ATORN® Plunge milling cutter for non-ferrous metals



• Please adjust these guideline values according to clamping operation and machine set-up!

260400....  
260401....

260402....  
260403....  
270104....

ISO	Materials group	Vc m/min	
		HC4410	HW4410
N	Aluminium alloys, long-chipping 100-400 N/mm <sup>2</sup>	1500 - 3000 1000 - 2000	1000 - 2000 800 - 1600
	Aluminium alloys, short-chipping up to 400 N/mm <sup>2</sup>	1000	800
	Copper alloys, long-chipping 150-250 N/mm <sup>2</sup>	300	250
	Copper alloys, short-chipping up to 500 N/mm <sup>2</sup>	500	400
	Magnesium alloys, long-chipping 160-300 N/mm <sup>2</sup>	500	400
	Thermoplastics 350-700 N/mm <sup>2</sup>	400	300
	Thermosets 20-40 N/mm <sup>2</sup>	200	150

ISO	Maximum feed per tooth = fz (mm/z.)	
	VPGT 1604... ap max. = 8 mm	VCGT 2205... ap max. = 9 mm
N	0.35	0.5
	0.3	0.4

## ATORN® High-speed milling cutter range



• Please adjust these guideline values according to clamping operation and machine set-up!

264001 - 264014

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz/tooth				Cutting speed Vc m/min	Feed fz/tooth			Cutting speed Vc m/min	Feed fz/tooth			
						HC4640					HC4540 / HC4544				HC4410 / HC4430			
						ADKX 0602	ADKX 0903	ADKX 1204	ADKX 1705		ADKX 0903	ADKX 1204	ADKX 1705		ADKX 0602	ADKX 0903	ADKX 1204	ADKX 1705
P	Unalloyed structural steel	Up to 700	St-52	1.0052	180 - 220	0.08	0.12	0.18	0.30				220 - 240	0.06	0.10	0.14	0.24	
	Machining steel	Up to 700	9 SMn 28	1.0715	180 - 220	0.08	0.12	0.18	0.30				220 - 240	0.06	0.10	0.14	0.24	
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	180 - 220	0.08	0.12	0.18	0.30				220 - 240	0.06	0.10	0.14	0.24	
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	180 - 220	0.06	0.10	0.16	0.24				220 - 240	0.05	0.08	0.14	0.20	
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	180 - 220	0.05	0.08	0.14	0.20				220 - 240	0.04	0.06	0.11	0.16	
	Cast steel	Up to 950	GS 40	1.0416	180 - 220	0.06	0.10	0.16	0.24				220 - 240	0.05	0.08	0.14	0.20	
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	180 - 220	0.05	0.08	0.10	0.16	180 - 240	0.08	0.12	0.18					
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	180 - 220	0.05	0.08	0.10	0.16	180 - 240	0.08	0.12	0.18					
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	180 - 220	0.05	0.08	0.10	0.16	180 - 240	0.08	0.12	0.18					
K	Grey cast iron	100 - 400	GG 25	0.6025									220 - 280	0.12	0.18	0.25	0.35	
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678									220 - 280	0.12	0.18	0.25	0.35	
	Ductile iron	400 - 800	GGG 60	0.7060									140 - 180	0.08	0.12	0.20	0.30	
	Malleable cast iron	350 - 700	GTS 55	0.8155									140 - 180	0.08	0.12	0.2	0.30	
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535									300 - 400	0.10	0.12	0.15	0.20	
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581									300 - 400	0.10	0.12	0.15	0.20	
	Copper alloy long-chipping	300 - 700	MS 63	2.0320									200 - 250	0.10	0.12	0.15	0.20	
	Copper alloy short-chipping	Up to 500	MS 58	2.0402									200 - 250	0.10	0.12	0.15	0.20	
	Thermoplastic	40 - 70	PVC, acrylic glass										250-300	0.12	0.20	0.25	0.35	
	Thermoset	20 - 40	Bakelite										200 - 250	0.12	0.20	0.25	0.35	
S	Titanium alloy	Up to 950	TiAl6V4	3.7165						60 - 80	0.08	0.12	0.15	40 - 60	0.05	0.08	0.12	0.15
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174						40 - 60	0.08	0.12	0.15	40 - 60	0.05	0.08	0.12	0.15
	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670						40 - 60	0.08	0.12	0.15	40 - 60	0.05	0.08	0.12	0.15
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718						20 - 40	0.08	0.12	0.15	20 - 40	0.05	0.08	0.12	0.15

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material examples	Material number	Cutting speed Vc m/min	Feed fz/tooth			
						HC4410 / HW4410			
						ADHX 0602	ADHX 0903	ADHX 1204	ADHX 1705
P	Unalloyed structural steel	Up to 700	St-52	1.0052					
	Machining steel	Up to 700	9 SMn 28	1.0715					
	Unalloyed tempered steel	500 - 950	Ck45	1.1191					
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131					
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343					
	Cast steel	Up to 950	GS 40	1.0416					
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301					
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104					
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006					
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	800-1000	0.20	0.25	0.30	0.40
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	350-500	0.10	0.12	0.15	0.20
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	350-500	0.12	0.15	0.20	0.30
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	250-300	0.10	0.12	0.15	0.20
	Thermoplastic	40 - 70	PVC, acrylic glass		250-300	0.12	0.20	0.24	0.35
	Thermoset	20 - 40	Bakelite		200-350	0.12	0.20	0.24	0.35
S	Titanium alloy	Up to 950	TiAl6V4	3.7165					
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174					
	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670					
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718					

Cutting depth ap / mm			
ADHX ..0602	ADHX ..0903	ADHX ..1204	ADHX ..1705
5.5	8.5	12.0	16.5

**palbit**  **Tangential shoulder milling cutter 90° TGPLUS 90190**



- $ae = 0,7 \times D$
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260247....  
260248....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Feed fz/tooth (LNXT 13..MP)	Cutting speed Vc m/min			
						◀ Wear resistance			Toughness ▶
						PHS320	PH7920	PHS740	PH7740
						++	±	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,10 - 0,35		180 - 250	140 - 170	140 - 170
	Tempering steel	500 - 950	42 CrMo4	1.7225	0,10 - 0,30		170 - 210	130 - 160	130 - 160
	Tempering steel	950 - 1300	43CrMo4	1.3563	0,10 - 0,20		160 - 200	110 - 140	110 - 140
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,10 - 0,30				120 - 180
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,10 - 0,25				100 - 150
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,10 - 0,20				70 - 130
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,10 - 0,35	180 - 320	170 - 300		
	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,10 - 0,30	160 - 270	150 - 250		
	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,10 - 0,25	100 - 230	90 - 210		

Usage conditions: ++ = good ± = average -- = difficult



**palbit**  **High feed-rate milling cutter TOROMILL 24590 / 25090 / 25190**



- $ae = 0,7 \times D$
- Please adjust these guideline values according to clamping operation and machine set-up!

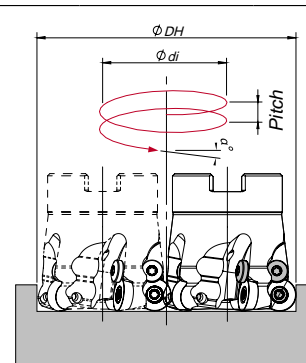
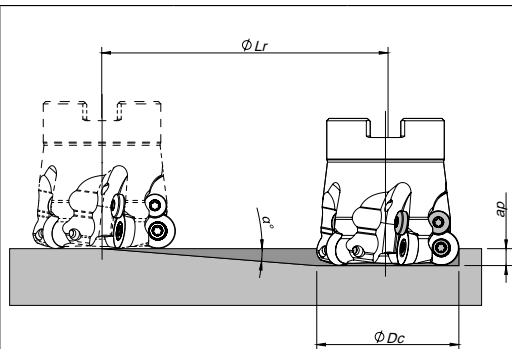
260281.... 260290....  
260284.... 260289....  
260287....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min						
					◀ Wear resistance						Toughness ▶
					PH6103	PH6910	PH6920	PH6125	PH6135	PH6740	PDP410
					++	++	±	±	--	--	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	180 - 300	180 - 250	150 - 230	160 - 190	150 - 180	130 - 160	
	Tempering steel	500 - 950	42 CrMo4	1.7225	180 - 250	170 - 210	140 - 220	140 - 180	140 - 170	120 - 150	
	Tempering steel	950 - 1300	43CrMo4	1.3563	180 - 230	160 - 200	130 - 180	130 - 160	120 - 150	100 - 130	
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155		170 - 300	150 - 280			130 - 250	
	Grey cast iron	Up to 260 HB	GG 25	0.6025		150 - 250	130 - 230			110 - 220	
	Ductile iron	Up to 280 HB	GGG 60	0.7060		90 - 210	80 - 190			80 - 170	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535							
H	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	120 - 240						

Usage conditions: ++ = good ± = average -- = difficult

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	RD..07		RD..10		RD..12		RD..16		RD..20	
					fz mm/t	ap mm	fz mm/t	ap mm	fz mm/t	ap mm	fz mm/t	ap mm	fz mm/t	ap mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	≤ 0,18	≤ 1,5	≤ 0,24	≤ 2,5	≤ 0,27	≤ 2,5	≤ 0,33	≤ 3,5	≤ 0,33	≤ 5
	Tempering steel	500 - 950	42 CrMo4	1.7225	≤ 0,18	≤ 1,5	≤ 0,24	≤ 2,5	≤ 0,25	≤ 2,5	≤ 0,33	≤ 3,5	≤ 0,33	≤ 5
	Tempering steel	950 - 1300	43CrMo4	1.3563	≤ 0,15	≤ 1,5	≤ 0,21	≤ 2,5	≤ 0,20	≤ 2,5	≤ 0,27	≤ 3,5	≤ 0,27	≤ 5
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	≤ 0,20	≤ 1,5	≤ 0,25	≤ 2,5	≤ 0,24	≤ 2,5	≤ 0,35	≤ 3,5	≤ 0,35	≤ 5
	Grey cast iron	Up to 260 HB	GG 25	0.6025	≤ 0,20	≤ 1,5	≤ 0,25	≤ 2,5	≤ 0,24	≤ 2,5	≤ 0,35	≤ 3,5	≤ 0,35	≤ 5
	Ductile iron	Up to 280 HB	GGG 60	0.7060	≤ 0,18	≤ 1,5	≤ 0,22	≤ 2,5	≤ 0,22	≤ 2,5	≤ 0,32	≤ 3,5	≤ 0,32	≤ 5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	≤ 0,45	≤ 1,5	≤ 0,80	≤ 2,5						
H	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	≤ 0,12	≤ 1,5	≤ 0,18	≤ 2,5	≤ 0,18	≤ 2,5	≤ 0,25	≤ 3,5	≤ 0,20	≤ 5

**Ramping and helical plunge milling**



Indexable cutting inserts	$\phi_{Dc}$	Ramping			Helical plunge milling		
		$\alpha^\circ$	ap max.	LR min.	$\phi_{DH}$ min.	$\phi_{DH}$ max.	Pitch max. / U
RD..07	15	9,4	3,5	21,1	23 -	- 30	4 7
	16	8	3,5	24,9	25 -	- 32	3 7
	20	6	3,5	33,3	33 -	- 40	4 6
RD..10	20	25	5	10,7	30 -	- 40	14 29
	25	22	5	12,4	40 -	- 50	19 31
	30	13,5	5	20,8	50 -	- 60	15 22
	35	12	5	23,5	60 -	- 70	16 23
	42	10	5	28,4	74 -	- 84	17 23
	52	7	5	40,7	94 -	- 104	16 20
RD..12	24	17	6	19,6	36 -	- 48	11,1 23
	25	16,2	6	20,7	38 -	- 50	11 22
	35	12	6	28,2	58 -	- 70	15 23
	42	10,3	6	33	72 -	- 84	17 23
	50	6,4	6	53,5	88 -	- 100	13 17
	52	6	6	57,1	92 -	- 104	13 17
	66	3,5	6	79,8	120 -	- 132	12 15
	80	2,5	6	104,1	148 -	- 160	12 14
RD..16	32	20	8	22	48 -	- 64	18 36
	35	18	8	24,6	54 -	- 70	19 35
	52	11,3	8	34,7	88 -	- 104	26 37
	66	8,5	8	53,5	116 -	- 132	23 30
	80	6	8	76,1	144 -	- 160	21 26
	125	3,5	8	130,8	234 -	- 250	20 24
	160	2,5	8	183,2	304 -	- 320	19 21
RD..20	80	6	10	76,1	140 -	- 160	19 26
	100	5	10	91,4	180 -	- 200	21 27
	125	4,5	10	101,6	230 -	- 250	25 30
	160	3	10	152,6	300 -	- 320	23 26



## ATORN® Milling inserts WNEU 04



• Please adjust these guideline values according to clamping operation and machine set-up!

262566 ....  
262567 ....  
262568 ....

295830 ....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min		
					HC 4620	HC 4430	HC 4630
P	Structural steel	700 - 950	Ck45	1.1191	160 - 250	150 - 240	100 - 200
	Tempering steel	500 - 950	42 CrMo4	1.7225	130 - 220	130 - 220	
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	110 - 200	110 - 200	
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006			60 - 130
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301			110 - 130
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120 - 240	120-200	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120 - 220		

Application	ae / Ø	Feed fz mm / tooth			Vc - Correction factor
		0.05	0.1	0.15	
Contact width	100%	0.05	0.1	0.15	1
Shoulder milling	25%	0.06	0.12	0.2	1.3
	10%	0.08	0.16	0.3	1.5
	5%	0.11	0.22	0.4	1.6
Centre chip thickness hm		0.06	0.09	0.16	-

## ATORN® Milling inserts WNEU 08



• Please adjust these guideline values according to clamping operation and machine set-up!

262565 ....

295828 ....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min		
					HC 4620	HC 4430	HC 4630
P	Structural steel	700 - 950	Ck45	1.1191	175 - 280	150 - 230	100 - 170
	Tempering steel	500 - 950	42 CrMo4	1.7225	145 - 215	130 - 180	
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130 - 190	110 - 160	
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006			80 - 130
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301		80 - 160	110 - 180
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	140 - 270	120-230	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 160		

Application	ae / Ø	Feed fz mm / tooth			Vc - Correction factor
		0.05	0.1	0.15	
Contact width	100%	0.05	0.1	0.15	1
Shoulder milling	25%	0.06	0.12	0.2	1.3
	10%	0.08	0.16	0.3	1.5
	5%	0.11	0.22	0.4	1.6
Centre chip thickness hm		0.06	0.09	0.16	-



**palbit**  **High feed-rate milling cutter LINEPRO 40095 / 40595 / 41095**



- $ae = 0,7 \times D$
- Please adjust these guideline values according to clamping operation and machine set-up!

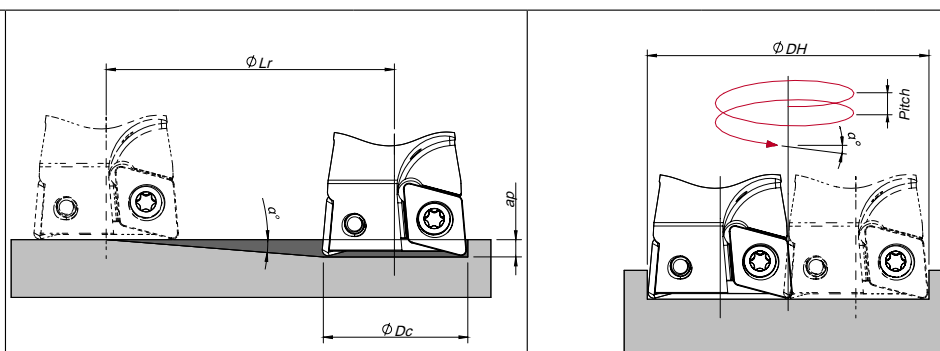
260295.... 260294....  
260293....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min					PCD	PCBN
					◀ Wear resistance			Toughness ▶			
					PHD103	PH6103	PH6910	PH6125	PH6135	PDP410	PBH910
					++	++	++	±	--		
P	Unalloyed structural steel	Up to 700	St-52	1.0052		180 - 300	180 - 250	160 - 190	150 - 180		
	Tempering steel	500 - 950	42 CrMo4	1.7225		180 - 250	170 - 210	140 - 180	140 - 170		
	Tempering steel	950 - 1300	43CrMo4	1.3563		180 - 230	160 - 200	130 - 160	120 - 150		
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155			170 - 300	160 - 290			
	Grey cast iron	Up to 260 HB	GG 25	0.6025			150 - 250	140 - 240			
	Ductile iron	Up to 280 HB	GGG 60	0.7060			90 - 210	80 - 200			
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300 - 1.000					800 - 3.000	
H	Hardened materials up to 60 HRC		X153CrMoV12	1.2379		120 - 260					200 - 600

Usage conditions: ++ = good ± = average -- = difficult

Indexable cutting inserts	fz mm/t		ap Rec.
	ae	Vc	
XD.. 04	0,1 - 0,2	0,1 - 0,15	0,1 - 0,5
XD.. 06	0,15 - 0,3	0,1 - 0,25	0,2 - 0,8
XD.. 10	0,15 - 0,35	0,1 - 0,3	0,2 - 0,8

**Ramping and helical plunge milling**



Indexable cutting inserts	ØDc	Ramping			Helical plunge milling		
		α°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
XDHW 04...	10	7,3	0,8	6,2	18	-	3,2
	12	5,3	0,8	8,6	22	20	4
XDHW 06...	16	8	1	7,1	30	24	2,9
	20	5,7	1	10	38	24	3,5
	25	4	1	14,3	48	40	6,2
XDHW 10...	25	8,7	1	6,5	48	50	7,1
	35	5,2	1	11	68	50	11,1
	42	4	1	14,3	82	70	12
	52	3	1	19,1	102	84	9,4
	66	2,3	1	24,9	130	104	10
	80	1,8	1	31,8	158	132	8,8
						160	84

## Application recommendations: ball-nose cutter PFB



260530 .... 260532 .... 260534 ....  
260531 .... 260533 ....

### Recommended qualities for various material groups

Carbide quality	Insert geometry	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
XP3320	PFB-SP	○	○	○		●	○
XP3225	PFB-SP PFB-Q	●	●		● 1)	○	
XP3310	PFB-SH			●			●
XC4505	PFB-D				● 2)		

1) = best choice for aluminium and copper alloys  
2) = best choice for graphite and composite materials

### Cutting data recommendations, insert type SP, SH, Q

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							6 - 8	10 - 12	16 - 20	25 - 32
P	Machining steel	Up to 575	9 SMn 28	1.0715	300	0.02 x D	0.1	0.12	0.14	0.18
	Tempering steel	Up to 900	42 CrMo4	1.7225	300	0.02 x D	0.07	0.1	0.12	0.14
	Tempering steel	Up to 1100	43CrMo4	1.3563	250	0.02 x D	0.07	0.1	0.12	0.14
M	Stainless steel, ferr./marten.	Up to 800	X10 Cr13	1.4006	250	0.02 x D	0.07	0.12	0.14	0.17
K	Grey cast iron	Up to 300	GG 25	0.6025	400	0.02 x D	0.12	0.14	0.18	0.22
	Alloyed grey cast iron	Up to 600	GG-NiCr 35 2	0.6678	300	0.02 x D	0.1	0.12	0.14	0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	500	0.03 x D	0.12	0.14	0.18	0.22
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	300	0.03 x D	0.11	0.13	0.17	0.22
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	90	0.02 x D	0.06	0.08	0.11	0.13
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	50	0.015 x D	0.04	0.05	0.06	0.06
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	180	0.015 x D	0.05	0.06	0.07	0.07
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	200	0.015 x D	0.06	0.07	0.08	0.01
	Hardened materials up to 64 HRc		100Cr6	1.2067	150	0.01 x D	0.05	0.06	0.07	0.07

### Cutting data recommendations, insert type D

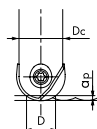
• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							6 - 8	10 - 12	16 - 20	25 - 32
N	Fibre-reinforced plastics		CFRP, GFRP	3.3535	300	0.03 x D	0.11	0.13	0.17	0.2
	Graphite		C8000	2.1016	500	0.03 x D	0.14	0.17	0.21	0.25

**Cutting depth and actual cutting diameter**

Cutting depth ap / mm		Actual cutting diameter / mm														
Dc	R	0.1	0.2	0.3	0.4	0.5	0.8	1	1.5	2	2.5	3	3.5	4	4.5	5
6	3	1.5	2.2	2.6	3	3.3	4.1									
7	3.5	1.6	2.3	2.8	3.3	3.6	4.5									
8	4	1.8	2.5	3	3.5	3.9	4.8									
10	5	2	2.8	3.4	3.9	4.4	5.4	6	7.1							
12	6	2.2	3.1	3.7	4.3	4.8	6	6.6	7.9	8.9						
16	8	2.5	3.6	4.3	5	5.6	7	7.7	9.3	10.6	11.6					
20	10	2.8	4	4.9	5.6	6.2	7.8	8.7	10.5	12	13.2	14.3	15.2			
25	12.5	3.2	4.5	5.4	6.3	7	8.8	9.8	11.9	13.6	15	16.2	17.3	18.3		
30	15	3.5	4.9	6	6.9	7.7	9.7	10.8	13.1	15	16.6	18	19.3	20.4	21.4	22.4
32	16	3.6	5	6.2	7.1	7.9	10	11.1	13.5	15.5	17.2	18.7	20	21.2	22.2	23.2

**Determining the actual cutting diameter D**

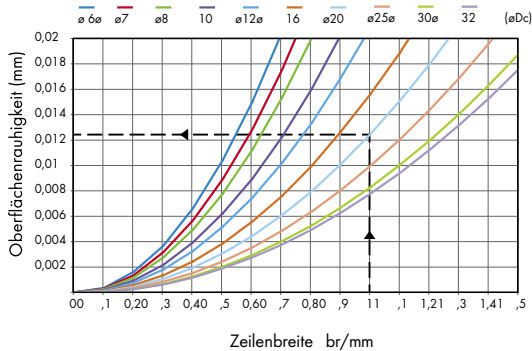
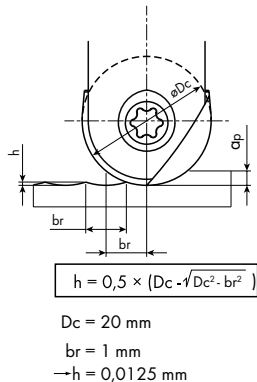


$$D = 2\sqrt{ap(Dc - ap)}$$

**Recommended line width / surface quality**

Dc mm	6	7	8	10	12	16	20	25	30	32
Pf mm	0.4	0.45	0.5	0.6	0.7	0.8	1	1.2	1.3	1.4
h mm	0.007	0.007	0.008	0.009	0.01	0.01	0.012	0.014	0.014	0.015

**Theoretical milled surface roughness process**



## Usage recommendations for torus milling cutter PFR



### Cutting data recommendations, insert type ST, SH

• Please adjust these guideline values according to clamping operation and machine set-up!

260540 .... 260542 .... 260544 ....  
260541 .... 260543 ....

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min			Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
					2.5 x D	5 x D	8 x D		8 - 10	12 - 16	20 - 32
P	Machining steel	Up to 575	9 SMn 28	1.0715	200	x 0.8	x 0.6	0.05 x D	0.2	0.22	0.25
	Tempering steel	Up to 900	42 CrMo4	1.7225	180			0.05 x D	0.18	0.22	0.25
	Tempering steel	Up to 1100	43CrMo4	1.3563	150			0.05 x D	0.15	0.18	0.2
M	Stainless steel, ferr./marten.	Up to 800	X10 Cr13	1.4006	150			0.03 x D	0.12	0.15	0.18
K	Grey cast iron	Up to 300	GG 25	0.6025	200			0.05 x D	0.2	0.25	0.3
	Alloyed grey cast iron	Up to 600	GGL-NiCr 35 2	0.6678	150			0.05 x D	0.15	0.2	0.25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300			0.05 x D	0.25	0.3	0.35
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50			0.02 x D	0.08	0.1	0.15
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	30			0.02 x D	0.05	0.8	0.12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	80			0.025 x D	0.08	0.1	0.15
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	120	0.03 x D	0.1	0.12	0.18		
	Hardened materials up to 64 HRC		100Cr6	1.2067	60	0.02 x D	0.05	0.08	0.1		

### Cutting data recommendations, insert type D

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min			Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
					2.5 x D	5 x D	8 x D		8 - 10	12 - 16	20 - 32
N	Fibre-reinforced plastics		CFRP, GFRP	3.3535	200	x 0.8	x 0.6	0.5 x D	0.1	0.15	0.2
	Graphite		C8000	2.1016	250			0.1 x D	0.4	0.5	0.5

### Cutting data recommendations, steel shank, finish milling

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							8	10 - 12	16 - 20	25 - 32
P	Machining steel	Up to 575	9 SMn 28	1.0715	450	0.02 x D	0.1	0.12	0.14	0.18
	Tempering steel	Up to 900	42 CrMo4	1.7225	450	0.02 x D	0.07	0.1	0.12	0.14
	Tempering steel	Up to 1100	43CrMo4	1.3563	375	0.02 x D	0.07	0.1	0.12	0.14
M	Stainless steel, ferr./marten.	Up to 800	X10 Cr13	1.4006	375	0.02 x D	0.07	0.12	0.14	0.17
K	Grey cast iron	Up to 300	GG 25	0.6025	600	0.02 x D	0.12	0.14	0.18	0.22
	Alloyed grey cast iron	Up to 600	GGL-NiCr 35 2	0.6678	450	0.02 x D	0.1	0.12	0.14	0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	750	0.03 x D	0.12	0.14	0.18	0.22
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	120	0.02 x D	0.06	0.08	0.11	0.13
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	70	0.015 x D	0.04	0.05	0.06	0.06
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	270	0.015 x D	0.05	0.06	0.07	0.07
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	300	0.015 x D	0.06	0.07	0.08	0.1
	Hardened materials up to 64 HRC		100Cr6	1.2067	230	0.01 x D	0.05	0.06	0.07	0.07

### Cutting data recommendations, solid carbide shank, finish milling

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min			Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
					Short	Long	Extra-long		8	10 - 12	16 - 20	25 - 32
P	Machining steel	Up to 575	9 SMn 28	1.0715	540	480	360	0.02 x D	0.1	0.12	0.14	0.18
	Tempering steel	Up to 900	42 CrMo4	1.7225	540	480	360	0.02 x D	0.07	0.1	0.12	0.14
	Tempering steel	Up to 1100	43CrMo4	1.3563	450	400	300	0.02 x D	0.07	0.1	0.12	0.14
M	Stainless steel, ferr./marten.	Up to 800	X10 Cr13	1.4006	450	400	300	0.02 x D	0.07	0.12	0.14	0.17
K	Grey cast iron	Up to 300	GG 25	0.6025	720	640	480	0.02 x D	0.12	0.14	0.18	0.22
	Alloyed grey cast iron	Up to 600	GGL-NiCr 35 2	0.6678	540	480	360	0.02 x D	0.1	0.12	0.14	0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	600	800	600	0.03 x D	0.12	0.14	0.18	0.22
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	150	144	110	0.02 x D	0.06	0.08	0.11	0.13
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	80	80	60	0.015 x D	0.04	0.05	0.06	0.06
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	290	288	220	0.015 x D	0.05	0.06	0.07	0.07
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	340	320	240	0.015 x D	0.06	0.07	0.08	0.1
	Hardened materials up to 64 HRC		100Cr6	1.2067	260	240	180	0.01 x D	0.05	0.06	0.07	0.07

## ATORN® Cutting data recommendations for tangential shoulder milling cutter 90°

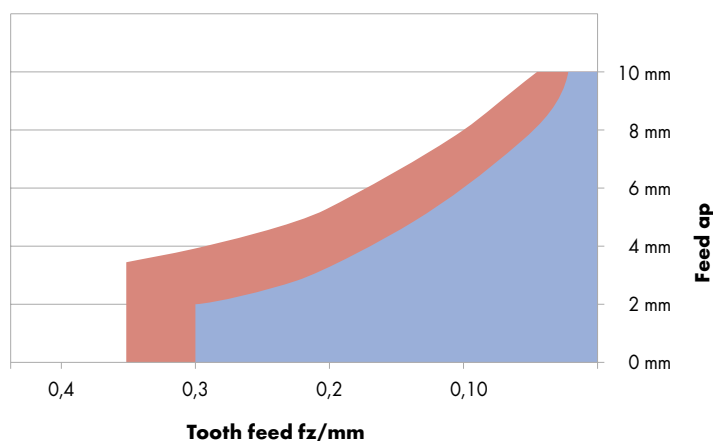
• Please adjust these guideline values according to clamping operation and machine set-up!



262566 ....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Carbide quality	Cutting speed Vc m/min
P	Machining steel	Up to 700	9 SMn 28	1.0715	HC4640	200 - 220
	Unalloyed structural steel	Up to 700	St-52	1.0052		200 - 220
	Structural steel	700 - 950	Ck45	1.1191		200 - 220
	Tempering steel	500 - 950	42 CrMo4	1.7225		180 - 200
	Cast steel	Up to 950	GS 40	1.0416		140 - 160
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131		140 - 180
	Tempering steel	950 - 1300	43CrMo4	1.3563		120 - 160
	Nitriding steel	950 - 1300	31CrMoV9	1.8519		120 - 140
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343		120 - 140
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	HC4420	200 - 240
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678		160 - 200
	Ductile iron	Up to 280 HB	GGG 60	0.7060		140 - 180
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155		160 - 200

Recommended tooth feed fz  
with  $a_e = 0.6 \times d1$



## ATORN® Disc milling cutter

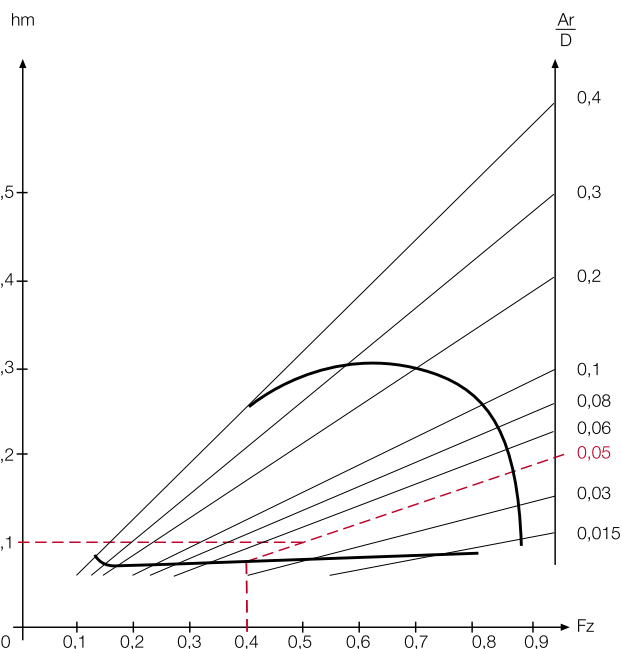
• The average **chip thickness hm** should be at least 0.1 mm to prevent the indexable inserts becoming worn quickly. For groove milling the chip thickness is much smaller than the feed per tooth. Thus the ratio between **groove depth Ar** and **milling cutter diameter D** must be observed. The average chip thickness and the corresponding minimum feed rate is illustrated in the following diagram.



262600....

262610....

Example: milling cutter Ø D 160 mm  
Groove depth Ar = 8 mm  
 $Ar / D = 0.05$   
**Result: Feed per tooth fz = 0.4 mm**



ISO	Materials group	Type	Cutting speed Vc m/min
P	Carbon steel	HC 4630 TiAlN-coated	200
	Tool steel	HC 4630 TiAlN-coated	150
M	Stainless steel, austenitic	HC 4630 TiAlN-coated	160
K	Grey cast iron	HW 4415	100
		HC 4630 TiAlN-coated	140
N	Al. alloys	HW 4415	350

FOR  
**3000 CHUCKS**  
FIND THE RIGHT CLAMPING JAWS.  
AND DO IT  
**BLINDFOLDED.**

ALL IT TAKES IS A FEW CLICKS:  
**CLAMPING JAWS FINDER**

THAT'S POWER TO PRODUCE

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE



# Turning tools

## Indexable cutting inserts


<b>INFO</b>	Overview of indexable cutting insert geometries	845
	ISO indexable cutting inserts negative	846
	ISO indexable cutting inserts positive	879
	ISO indexable cutting inserts, ceramic <b>NEW</b>	904
	ISO indexable cutting inserts CBN and PKD	905

## Monoblock carrier tools for internal and external machining

<b>INFO</b>	Overview of clamp mountings and boring bars	911
	Clamp mounting, negative	912
	Clamp mounting, positive	927
	Boring bars, negative	936
	Boring bars, positive	940
	Vibration-dampened boring bars, modular <b>NEW</b>	948
	Mini clamp mountings, positive	953
	Mini boring bars, positive	954

	Miniature boring bar holder <b>NEW</b>	959
	Solid carbide miniature boring bar holder <b>NEW</b>	960
	ISO indexable cutting inserts, Mini	962

## Carbide monoblock turning tools

	Turning bars and turning tools	965
---	--------------------------------	-----

## Thread turning

<b>INFO</b>	Overview of thread production	970
	Thread cutting clamp mountings	971
	Thread tool holder with internal cooling <b>NEW</b>	972
	Thread cutting boring bars	973
	Threading inserts	975
	High-performance threading inserts	980
	Thread cutting sets Standard, Ultra and Mini	983
	Grooving inserts for thread cutter holders	986





Recess turning systems		
<b>INFO</b>	Overview of types and chip breakers GROOVE system	988
	Cutting inserts AD, AE GROOVE system	993
	Carrier tools for cutting inserts AD AE GROOVE system	1004
	Boring bar GROOVE system <b>NEW</b>	1006
	Recess clamp mounting GROOVE modular <b>NEW</b>	1007
	Cutting inserts ASS GROOVE system	1008
	Carrier tools for cutting inserts ASS GROOVE system	1010
	Clamping shafts for cutting edge holders	1011
	Carrier tools DED	1012
	Indexable cutting inserts DED	1015
	Grooving and parting-off system MINI PALBIT	1016
	Internal turning system MINI CUT	1019
	Flexo carrier tools MINI CUT	1020
<b>INFO</b>	Overview of mini-bore	1029

	Internal turning system mini-bore	1030
	Multi-function tools DT-Line <b>NEW</b>	1040
Grooving		
<b>INFO</b>	Overview of keyway slotting with system	1042
	Keyway slotting Carrier tools and cutting inserts	1043
	Hexagonal ram Carrier tools and cutting inserts <b>NEW</b>	1047
Knurling		
	Smoothing tool	1048
	Lettering tool	1049
<b>INFO</b>	Knurling tools	1051
	Knurling carrier tools and knurling wheels	1053
Technical information, usage recommendations		1059



## Summary of icons used for drilling tools

INFO

## Cutting material

**HM** e.g.: carbide metal**CBN** e.g.: cubic boron nitride**PKD** e.g.: polycrystalline diamond


## Coating

**TiN** Titanium-nitride coating**TiCN** Titanium-carbo-nitride coating**TiAlN** Titanium-aluminium-nitride coating

## Standard

**DIN 4951-4965** Complies with DIN 4951 - 4965

## Shank design

 Corresponds to straight shank

## Thread

**M** e.g. metric thread**MF** e.g. metric fine thread**BSW** e.g. British Standard Whitworth


## Thread angle

 Thread angle is 55°

## Coolant design

 With internal coolant supply

## Cutting data

 Further information such as cutting data recommendations is available in the technical appendix

... optimal chip control.

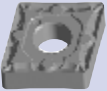
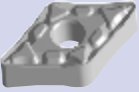
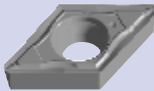


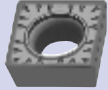
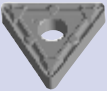
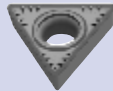







Ground sharp ...

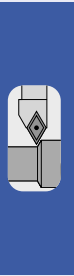
**ATORN**<sup>®</sup>  
Performance demands quality

Overview of geometries of indexable cutting inserts

ISO designation codes in the INFO section

INFO

negative		P	M	K	N	S	positive		P	M	K	N	S
	CN...	846	850	852	853	853		CC...	879	882	884	884	
	DN...	854	858	860	861	861		DC...	885	888	890	890	
	KNUX	862						RC...	891				
	SN...	862	865	866		866		SC...	891	892	892	893	
	TN...	867	868	870	870	871		TC...	893	896	897	897	
	VN...	871	872		873			VB...	898	899			
	WN..	873	875	877	878	878		VC...	900	901		903	
	Ceramics							WC...	903	903			
	CBN												
	PKD												




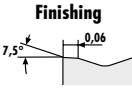
ISO indexable cutting inserts

# ISO indexable cutting inserts CN.. ISO P

**ISO P**

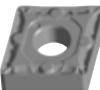
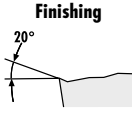
• 80° rhombic, negative 0°

## Chip breaker FP1 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <p>Finishing</p> 	CNMG 090304-FP1	●		○						ACP 15 T	10 366704 0015	7,20
	CNMG 120404-FP1	●		○						ACP 15 T	10 366704 0115	8,45
	CNMG 120408-FP1	●	○							ACP 25 T	10 366704 0225	8,45
		●		○						ACP 15 T	10 366704 0315	8,45
		●	○						ACP 25 T	10 366704 0425	8,45	


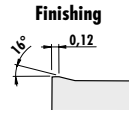
3135

## Chip breaker FP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Finishing</p> 	CNMG 120404-FP	●		○						HC 7620	10 311151 2612	8,05
	CNMG 120408-FP	●		○						HC 7620	10 311151 2712	8,05


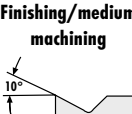
3147

## Chip breaker FP2 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <p>Finishing</p> 	CNMX 120404-FP2	●		○						ACP 15 T	10 366705 0115	8,45
	CNMX 120408-FP2	●		○						ACP 15 T	10 366705 0215	8,45


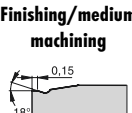
3135

## Chip breaker FFP, CERMET negative design

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <p>Finishing/medium machining</p> 	CNMG 120404-FFP	●	○	○						ATU 10 T	10 366612 0140	8,45
	CNMG 120408-FFP	●	○	○						ATU 10 T	10 366612 0240	8,45

3135

## Chip breaker LC negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Finishing/medium machining</p> 	CNMG 120404-LC	●								PHG 115	10 333605 0164	8,70
		●								PHG 125	10 333605 0165	8,70
	CNMG 120408-LC	●								PHG 115	10 333605 0264	8,70
		●								PHG 125	10 333605 0265	8,70
	CNMG 120412-LC	●								PHG 115	10 333605 0364	8,70
		●								PHG 125	10 333605 0365	8,70

3148

ISO	ACP 15 T	ACP 25 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240
ISO M stainless steel		Vc = 70 - 210
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.25 - 2.5	


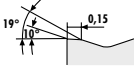
ISO	HC 7620
ISO P steel	Vc = 150 - 350
ISO K cast iron	Vc = 170 - 290
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.25 ap = 0.2 - 2.0

ISO	ACP 15 T
ISO P steel	Vc = 180 - 400
ISO K cast iron	Vc = 140 - 520
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.6 ap = 0.5 - 4.0

ISO	ATU 10 T
ISO P steel	Vc = 160 - 270
ISO M stainless steel	Vc = 130 - 240
ISO K cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 2.0

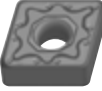
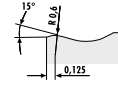
ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.50 ap = 0.60 - 3.00	

Chip breaker MP5 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	●	○	ISO designation										
 <p>Medium machining</p> 	CNMG 120404-MP5	●		○						ACP 15 T	10 366613 0115	8,45	
		●	○								ACP 25 T	10 366613 0225	8,45
		●									ACP 15 T	10 366613 0315	8,45
	CNMG 120408-MP5	●	○								ACP 25 T	10 366613 0425	8,45
		●	○								ACP 35 T	10 366613 0535	8,45
		●									ACP 15 T	10 366613 0615	8,45
	CNMG 120412-MP5	●	○								ACP 25 T	10 366613 0725	8,45
		●	○								ACP 25 T	10 366613 0725	8,45
		●	○								ACP 35 T	10 366613 0835	8,45


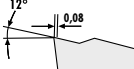
3135

Chip breaker MP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	●	-	ISO designation										
 <p>Medium machining</p> 	CNMG 120404-MP	●		○						HC 7620	10 311155 2612	8,05	
		●									HC 7630	10 311155 2613	8,05
	CNMG 120408-MP	●	○								HC 7610	10 311155 2711	8,05
		●	○								HC 7620	10 311155 2712	8,05
	CNMG 120412-MP	●									HC 7630	10 311155 2713	8,05
		●	○								HC 7610	10 311155 2811	8,05
	CNMG 160608-MP	●									HC 7620	10 311155 4012	15,40
		●									HC 7620	10 311155 4112	15,40


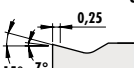
3147

Chip breaker MP3-HP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation									
 <p>Medium machining</p> 	CNMG 120408-MP3	●	○	○						ACP 25 T	10 311672 0114	8,85
		●	○	○							ACP 25 T	10 311672 0214
	<b>Highly wear-resistant</b>											


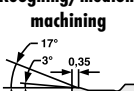
3147

Chip breaker PM negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	●	-	ISO designation										
 <p>Medium machining</p> 	CNMG 120404-PM	●		●						PHG 115	10 333607 0164	8,70	
		●		●							PHG 125	10 333607 0165	8,70
	CNMG 120408-PM	●		●							PHG 115	10 333607 0264	8,70
		●		●							PHG 125	10 333607 0265	8,70
	CNMG 120412-PM	●		●							PHG 115	10 333607 0364	8,70
		●		●							PHG 125	10 333607 0365	8,70
	CNMG 120416-PM	●		●							PHG 115	10 333607 0464	8,70
		●		●							PHG 125	10 333607 0465	8,70

3148

Chip breaker RP5 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation										
 <p>Roughing/medium machining</p> 	CNMG 120408-RP5	●		●						HC 7610	10 311520 1511	8,05	
		●		●							HC 7620	10 311520 1512	8,05
		●		●							HC 7630	10 311520 1513	8,05
	CNMG 120412-RP5	●		●							HC 7610	10 311520 1611	8,05
		●		●							HC 7620	10 311520 1612	8,05
		●		●							HC 7630	10 311520 1613	8,05

3147

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 130 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.4 ap = 0.25 - 5.0		

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 130 - 290	Vc = 120 - 280	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	Vc = 150 - 260	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.25 ap = 0.8 - 3.0	f = 0.18 - 0.4 ap = 0.6 - 6.0	


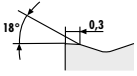
ISO	ACP 25 T
ISO P steel	Vc = 100 - 270
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.20 - 0.45 ap = 1.0 - 4.0

ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 270	Vc = 100 - 240
ISO K cast iron	Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.65 ap = 0.40 - 5.50	

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 160 - 320	Vc = 130 - 270	Vc = 110 - 230
ISO K cast iron	Vc = 160 - 520	Vc = 130 - 440	Vc = 110 - 390
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.20 - 0.60 ap = 0.80 - 6.0		


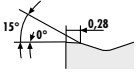
Continued on next page >>>

**Chip breaker RP1 negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation										
 <p><b>Roughing/medium machining</b></p> 	CNMG 160608-RP1	●	○							ACP 35 T	10 366620 0335	16,20	
	CNMG 160612-RP1	●	○	○						ACP 25 T	10 366620 0525	16,20	
			●	○							ACP 35 T	10 366620 0635	16,20
	CNMG 160616-RP1	●	○	○							ACP 25 T	10 366620 0625	16,20
			●	○							ACP 35 T	10 366620 0735	16,20
	CNMG 190612-RP1	●	○	○							ACP 25 T	10 366620 0825	22,40
		●	○							ACP 35 T	10 366620 0935	22,40	
		●	○							ACP 25 T	10 366620 1125	22,40	
		●	○							ACP 35 T	10 366620 1235	22,40	


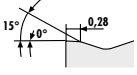
3135

**Chip breaker RP2 negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation										
 <p><b>Roughing</b></p> 	CNMG 120408-RP2	●		○						ACP 15 T	10 366618 0115	8,45	
		●	○							ACP 25 T	10 366618 0225	8,45	
	CNMG 120412-RP2	●		○						ACP 15 T	10 366618 0215	8,45	
		●	○								ACP 35 T	10 366618 0235	8,45
		●	○								ACP 25 T	10 366618 0325	8,45

3135


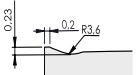
**Chip breaker RP3-HP negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
 <p><b>Roughing</b></p> 	CNMG 120408-RP3	●	○							ACP 25 T	10 311683 0114	8,85
	<b>Highly wear-resistant</b>											

3147



**Chip breaker GR negative**

NEW

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	●	ISO designation									
 <p><b>Roughing</b></p> 	CNMM 120408-GR	●								PHG 125	10 333689 0165	9,05
	CNMM 120412-GR	●								PHG 125	10 333689 0265	9,05

3148

**Chip breaker RP6-HP negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
 <p><b>Roughing</b></p> 	CNMG 190612-RP6	●	○							ACP 25 T	10 311682 0114	21,90
	<b>Highly wear-resistant</b>											

3147

ISO	ACP 25 T	ACP 35 T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.7 ap = 0.5 - 7.5	

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 6.0		

ISO	ACP 25 T
ISO P steel	Vc = 100 - 270
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.45 ap = 1.0 - 6.0

ISO	PHG 125
ISO P steel	Vc = 150 - 300
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.20 - 0.55 ap = 1.0 - 7.0

ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 130 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.5 ap = 1.0 - 5.0

Chip breaker RP7 negative

F finishing	M medium	R roughing	<b>ATORN®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	CNMM 120408-RP7	●		○				ACP 15 T	10 366703 0115	8,45
				○	●				○	APM 25 T	10 366703 0121	8,45
				●	○	○				ACP 25 T	10 366703 0225	8,45
				●	○					ACP 35 T	10 366703 0335	8,45
			CNMM 120412-RP7	○	●				○	APM 25 T	10 366703 0221	8,45
				●		○				ACP 15 T	10 366703 0415	8,45
				●	○	○				ACP 25 T	10 366703 0525	8,45
				●	○					ACP 35 T	10 366703 0635	8,45

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T	APM 25 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 250	Vc = 60 - 250
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200	Vc = 40 - 250
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250		
ISO S superalloys				Vc = 20 - 80
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 0.6 ap = 0.8 - 7.0			

Chip breaker RP8 negative up to 16 mm

F finishing	M medium	R roughing	<b>ATORN®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	CNMM 120412-RP8	●		○				ACP 15 T	10 366619 0415	8,45
				●	○	○				ACP 25 T	10 366619 0525	8,45
				●	○					ACP 35 T	10 366619 0635	8,45
			CNMM 120416-RP8	●	○	○				ACP 25 T	10 366619 0825	8,45
				●	○					ACP 35 T	10 366619 0935	8,45
			CNMM 160612-RP8	●		○				ACP 15 T	10 366619 1315	16,20
				●	○	○				ACP 25 T	10 366619 1425	16,20
				●	○					ACP 35 T	10 366619 1535	16,20

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 0.7 ap = 1.5 - 8.0		

Chip breaker RP8 negative from 19 mm

F finishing	M medium	R roughing	<b>ATORN®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	●	CNMM 190616-RP8	●		○				ACP 15 T	10 366621 0115	22,40
				●	○	○				ACP 25 T	10 366621 0225	22,40
				●	○	○				ACP 25 T	10 366621 0525	22,40
				●	○	○				ACP 25 T	5 366621 1125	43,80

3135

ISO	ACP 15 T	ACP 25 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240
ISO M stainless steel		Vc = 70 - 210
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.4 - 1.1 ap = 1.2 - 13.0	

Chip breaker RP9 negative from 19 mm

F finishing	M medium	R roughing	<b>ATORN®</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	●	CNMM 190616-RP9	●	○	○				ACP 25 T	10 366622 0125	22,40
			CNMM 190624-RP9	●	○	○				ACP 25 T	10 366622 0225	22,40
			CNMM 250924-RP9	●	○	○				ACP 25 T	5 366622 0325	43,80
			CNMM 250932-RP9	●	○	○				ACP 25 T	5 366622 0425	43,80

3135

ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.5 - 1.5 ap = 2.0 - 13.0





## ISO indexable cutting inserts CN.. ISO M

• 80° rhombic, negative 0°



**ISO M**

### Chip breaker FM5 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ISO designation												
 <p>Micro finishing</p> 	CNGP 120402-FM5				●	○	○	○		APM 20 T	10 366609 0120	15,50
	CNGP 120404-FM5				●	○	○	○		APM 20 T	10 366609 0220	15,50
	CNGP 120408-FM5				●	○	○	○		APM 20 T	10 366609 0320	15,50
	CNGP 120412-FM5				●	○	○	○		APM 20 T	10 366609 0420	15,50


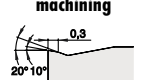
3135

### Chip breaker FM negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
ISO designation													
 <p>Finishing</p> 	CNGM 120404-FM			○	●					HC 7510	10 310153 2624	8,05	
	CNGM 120404-FM				●				○		HC 7520	10 310153 2625	8,05
	CNGM 120404-FM			○	●						HC 7820	10 311531 0112	8,05
	CNGM 120408-FM			○	●						HC 7510	10 310153 2724	8,05
	CNGM 120408-FM				●				○		HC 7520	10 310153 2725	8,05
	CNGM 120408-FM			○	●						HC 7820	10 311531 0212	8,05


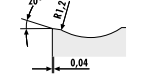
3147

### Chip breaker SF negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
ISO designation													
 <p>Finishing/medium machining</p> 	CNGM 120404-SF				●					PHS 215	10 333604 0371	8,70	
	CNGM 120404-SF				●						PHS 225	10 333604 0472	8,70
	CNGM 120408-SF				●						PHS 215	10 333604 0771	8,70
	CNGM 120408-SF				●						PHS 225	10 333604 0872	8,70
	CNGM 120412-SF				●						PHS 215	10 333604 1171	8,70
	CNGM 120412-SF				●						PHS 225	10 333604 1272	8,70



3148

### Chip breaker MM negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
ISO designation													
 <p>Medium machining</p> 	CNGM 120404-MM				●				○	HC 7520	10 310157 2625	8,05	
	CNGM 120404-MM				●					○	HC 7530	10 310157 2626	8,05
	CNGM 120408-MM				●					○	HC 7520	10 310157 2725	8,05
	CNGM 120408-MM				●					○	HC 7530	10 310157 2726	8,05
	CNGM 120412-MM				●					○	HC 7520	10 310157 2825	8,05
	CNGM 120412-MM				●					○	HC 7530	10 310157 2826	8,05

3147

### Chip breaker GS negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
ISO designation													
 <p>Medium machining</p> 	CNGM 120404-GS				●			●		PHH 920	10 333577 0194	9,10	
	CNGM 120404-GS				●			●			PHH 910	10 333577 0195	9,10
	CNGM 120408-GS				●			●			PHH 920	10 333577 0294	9,10
	CNGM 120408-GS				●			●			PHH 910	10 333577 0295	9,10
	CNGM 120412-GS				●			●			PHH 920	10 333577 0394	9,10
	CNGM 120412-GS				●			●			PHH 910	10 333577 0395	9,10

3148

ISO	APM 20 T
ISO M stainless steel	Vc = 60 - 200
ISO K cast iron	Vc = 120 - 220
ISO N Al/non-ferrous	Vc = 100 - 600
ISO S superalloys	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.25 ap = 0.2 - 2.5



ISO	HC 7510	HC 7520	HC 7820
ISO P steel	Vc = 140 - 320		Vc = 140 - 190
ISO M stainless steel	Vc = 175 - 270	Vc = 170 - 260	Vc = 170 - 240
ISO S superalloys		Vc = 30 - 60	Vc = 40 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.16 ap = 0.4 - 1.5		

ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 80 - 290	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.55 ap = 0.60 - 3.0	

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 150 - 240	Vc = 130 - 200
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.25 ap = 0.8 - 3.0	


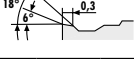
ISO	PHH 910	PHH 920
ISO M stainless steel	Vc = 130 - 250	Vc = 110 - 220
ISO S superalloys	Vc = 25 - 70	Vc = 20 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.50 ap = 0.50 - 4.0	

**Chip breaker MM5 negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation									
 Roughing/medium machining 	CNMG 090304-MM5	○	●							APM 25 T	10 366615 0021	7,20
	CNMG 120408-MM5	○	●							APM 25 T	10 366615 0121	8,45



3135

**Chip breaker RM5 negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
 Roughing/medium machining 	CNMG 120408-RM5	○	●							APM 25 T	10 366616 0121	8,45
	CNMG 120412-RM5	○	●							APM 25 T	10 366616 0221	8,45
	CNMG 160612-RM5	○	●							APM 25 T	10 366616 0421	16,20


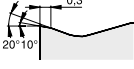
3135

**Chip breaker SM2 negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation									
 Roughing/medium machining 	CNMG 120404-SM2	○	●							ACM 20 T	10 311677 0112	8,85
	CNMG 120408-SM2	○	●							ACM 20 T	10 311677 0212	8,85



3147

**Chip breaker SS negative**

F finishing	M medium	R roughing	<b>palbit®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation									
 Roughing/medium machining 	CNMG 090304-SS		●							PHS 225	10 333609 0172	7,55
	CNMG 090308-SS		●							PHS 225	10 333609 0472	7,55
	CNMG 120404-SS		●							PHS 215	10 333609 0771	8,70
			●							PHS 225	10 333609 0772	8,70
	CNMG 120408-SS		●							PHS 215	10 333609 1271	8,70
			●							PHS 225	10 333609 1272	8,70
	CNMG 120412-SS		●							PHS 215	10 333609 1771	8,70
			●							PHS 225	10 333609 1772	8,70
CNMG 160608-SS		●							PHS 225	10 333609 2472	18,25	
CNMG 160612-SS		●							PHS 225	10 333609 2672	18,25	

3148

**Chip breaker RM (HC75..) negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	●	ISO designation									
 Roughing 	CNMG 120408-RM		●					○		HC 7530	10 310161 2726	8,05
	CNMG 120412-RM		●					○		HC 7530	10 310161 2826	8,05

3147

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.25 - 0.5 ap = 0.5 - 4.0

ISO	APM 25 T
ISO P steel	Vc = 80 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 6.0

ISO	ACM 20 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.14 - 0.4 ap = 1.0 - 4.2

ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 55 - 240	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 1.0 ap = 0.6 - 8.50	


ISO	HC 7530
ISO M stainless steel	Vc = 90 - 160
ISO S superalloys	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.22 - 0.40 ap = 1.2 - 4.0

## ISO indexable cutting inserts CN.. ISO K

**ISO K**

• 80° rhombic, negative 0°


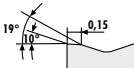
### Chip breaker RK smooth negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation	○		●				ACK 20 T		
 <p><b>Roughing/medium machining</b></p>			CNMA 120408-RK	○		●				ACK 20 T	10 <b>366610</b> 0130	<b>8,45</b>

3135

ISO	ACK 20 T
<b>ISO P</b> steel	Vc = 150 - 340
<b>ISO K</b> cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 7.5


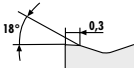
### Chip breaker MK negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation	○		●				ACK 20 T		
 <p><b>Roughing/medium machining</b></p> 			CNMG 120408-MK	○		●				ACK 20 T	10 <b>366617</b> 0130	<b>8,45</b>
			CNMG 120412-MK	○		●					ACK 20 T	10 366617 0230

3135

ISO	ACK 20 T
<b>ISO P</b> steel	Vc = 150 - 340
<b>ISO K</b> cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 5.0


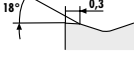
### Chip breaker RK2 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€		
-	○	●	ISO designation	○		●				ACK 20 T				
 <p><b>Roughing/medium machining</b></p> 			CNMG 120408-RK2	○		●				ACK 20 T	10 <b>366614</b> 0130	<b>8,45</b>		
			CNMG 120412-RK2	○		●					ACK 20 T	10 366614 0230	<b>8,45</b>	
			CNMG 160608-RK2	○		●						ACK 20 T	10 366614 0330	<b>16,20</b>
			CNMG 160612-RK2	○		●						ACK 20 T	10 366614 0430	<b>16,20</b>
			CNMG 190612-RK2	○		●						ACK 20 T	10 366614 0530	<b>22,40</b>

3135

ISO	ACK 20 T
<b>ISO P</b> steel	Vc = 150 - 340
<b>ISO K</b> cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.6 ap = 0.5 - 7.5

### Chip breaker RK3-HP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation	○		●				ACK 10 T			
 <p><b>Roughing</b></p> 			CNMG 120408-RK3	○		●				ACK 10 T	10 <b>311680</b> 0111	<b>8,85</b>	
			CNMG 120412-RK3	○		●					ACK 10 T	10 311680 0211	<b>8,85</b>
			CNMG 160612-RK3	○		●						ACK 10 T	10 311680 0311

3147

**Highly wear-resistant**




ISO	ACK 10 T
<b>ISO P</b> steel	Vc = 170 - 400
<b>ISO K</b> cast iron	Vc = 170 - 450
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 0.5 ap = 2.0 - 4.8

## ISO indexable cutting inserts CN.. ISO N

ISO N

- 80° rhombic, negative 0°

## Chip breaker NS negative




F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	●	-	ISO designation				●			LT 05	10	340001 0101	11,-
							●			LT 05	10	340001 0201	11,-
Finishing/medium machining													
													

3135

ISO	LT 05
ISO N Al/non-ferrous	Vc = 600 - 1200
Vc = [m/min]	f = 0.12 - 0.35
f = [mm/U]	ap = 0.25 - 5.0
ap = [mm]	

## Chip breaker MS negative

NEW

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	●	-	ISO designation				●			PH 0910	10	333603 0120	7,60
							●			PH 0910	10	333603 0320	7,60
Medium machining													
													
							●			PH 0910	10	333603 0520	7,60

3148




ISO	PH 0910
ISO N Al/non-ferrous	Vc = 35 - 630
Vc = [m/min]	f = 0.10 - 0.60
f = [mm/U]	ap = 0.20 - 3.6
ap = [mm]	

## ISO indexable cutting inserts CN.. ISO S

ISO S

- 80° rhombic, negative 0°




## Chip breaker MS1 negative

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	○	-	ISO designation		○			●		APS 15 T	10	366611 0131	8,45
					○			●		APS 10 T	10	366611 0232	8,45
Finishing/medium machining													
													
					○			●		APS 15 T	10	366611 0231	8,45
					○			●		APS 10 T	10	366611 0332	8,45

3135

ISO	APS 10 T	APS 15 T
ISO M stainless steel	Vc = 60 - 230	Vc = 50 - 220
ISO S superalloys	Vc = 30 - 120	Vc = 30 - 120
Vc = [m/min]	f = 0.08 - 0.3	
f = [mm/U]	ap = 0.25 - 3.0	
ap = [mm]		

## Chip breaker SS2 negative

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation		●			●		APS 40 T	10	366716 0140	12,50
					●			●		APS 40 T	10	366716 0240	12,50
Roughing/medium machining													
													
					●			●		APS 40 T	10	366716 0540	23,20

3135


ISO	APS 40 T
ISO M stainless steel	Vc = 80 - 200
ISO S superalloys	Vc = 60 - 160
Vc = [m/min]	f = 0.1 - 0.5
f = [mm/U]	ap = 1.0 - 5.0
ap = [mm]	

## ISO indexable cutting inserts DN.. ISO P

- 55° rhombic, negative 0°

ISO P


## Chip breaker FFP, CERMET negative design

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	<b>ISO designation</b>									
			DNMG 110404-FFP	●	○	○				ATU 10 T	10 366635 0140	11,50
			DNMG 150604-FFP	●	○	○				ATU 10 T	10 366635 0240	13,75

3135

ISO	ATU 10 T
<b>ISO P</b> steel	Vc = 160 - 270
<b>ISO M</b> stainless steel	Vc = 130 - 240
<b>ISO K</b> cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 2.0

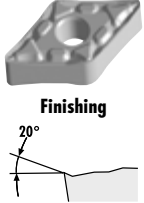
## Chip breaker FP1 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	<b>ISO designation</b>									
			DNMG 110404-FP1	●		○				ACP 15 T	10 366633 0115	11,50
			DNMG 150604-FP1	●	○	○				ACP 25 T	10 366633 0225	11,50
			DNMG 150608-FP1	●		○				ACP 15 T	10 366633 0315	13,75
			DNMG 150608-FP1	●		○				ACP 15 T	10 366633 0415	13,75

3135

ISO	ACP 15 T	ACP 25 T
<b>ISO P</b> steel	Vc = 180 - 400	Vc = 100 - 240
<b>ISO M</b> stainless steel		Vc = 70 - 210
<b>ISO K</b> cast iron	Vc = 140 - 520	Vc = 140 - 520
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.25 - 2.5	


## Chip breaker FP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	<b>ISO designation</b>									
			DNMG 110404-FP	●		○				HC 7620	10 311251 2312	10,95
			DNMG 110408-FP	●		○				HC 7610	10 311251 2411	10,95
			DNMG 150604-FP	●		○				HC 7610	10 311251 2412	10,95
			DNMG 150604-FP	●		○				HC 7610	10 311251 3011	13,10
			DNMG 150608-FP	●		○				HC 7620	10 311251 3012	13,10
			DNMG 150608-FP	●		○				HC 7620	10 311251 3112	13,10

3147

ISO	HC 7610	HC 7620
<b>ISO P</b> steel	Vc = 150 - 350	Vc = 170 - 290
<b>ISO K</b> cast iron	Vc = 140 - 340	Vc = 180 - 290
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.5	

## Chip breaker FP2 negative


F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	<b>ISO designation</b>									
			DNMX 150604-FP2	●		○				ACP 15 T	10 366706 0115	11,45
			DNMX 150608-FP2	●		○				ACP 15 T	10 366706 0225	11,45

3135

ISO	ACP 15 T
<b>ISO P</b> steel	Vc = 180 - 400
<b>ISO K</b> cast iron	Vc = 140 - 520
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.5 ap = 0.5 - 4.0

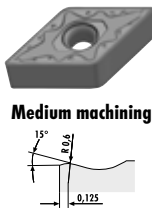
NEW

Chip breaker LC negative

F finishing	M medium	R roughing	<b>pablit</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Finishing/medium machining</p>	DNMG 150404-LC			●						PHG 115	10 333619 0164	11,90
	DNMG 150408-LC			●						PHG 125	10 333619 0165	11,90
	DNMG 150412-LC			●						PHG 115	10 333619 0264	11,90
	DNMG 150604-LC			●						PHG 125	10 333619 0265	11,90
	DNMG 150608-LC			●						PHG 115	10 333619 0364	11,90
	DNMG 150612-LC			●						PHG 125	10 333619 0365	11,90
	DNMG 150604-LC			●						PHG 115	10 333619 0464	12,75
	DNMG 150608-LC			●						PHG 125	10 333619 0465	12,75
	DNMG 150608-LC			●						PHG 115	10 333619 0564	12,75
	DNMG 150608-LC			●						PHG 125	10 333619 0565	12,75
	DNMG 150612-LC			●						PHG 115	10 333619 0664	12,75
	DNMG 150612-LC			●						PHG 125	10 333619 0665	12,75

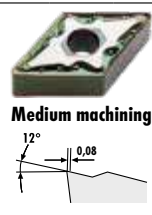
3148

Chip breaker MP negative

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Medium machining</p>	DNMG 110404-MP			●		○				HC 7620	10 311255 2312	10,95
	DNMG 110408-MP			●		○				HC 7630	10 311255 2313	10,95
	DNMG 110408-MP			●		○				HC 7610	10 311255 2411	10,95
	DNMG 110408-MP			●		○				HC 7620	10 311255 2412	10,95
	DNMG 110408-MP			●		○				HC 7630	10 311255 2413	10,95
	DNMG 150604-MP			●		○				HC 7610	10 311255 3011	13,10
	DNMG 150604-MP			●		○				HC 7620	10 311255 3012	13,10
	DNMG 150604-MP			●		○				HC 7630	10 311255 3013	13,10
	DNMG 150608-MP			●		○				HC 7610	10 311255 3111	13,10
	DNMG 150608-MP			●		○				HC 7620	10 311255 3112	13,10
	DNMG 150608-MP			●		○				HC 7630	10 311255 3113	13,10

3147

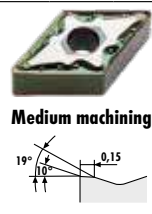
Chip breaker MP3-HP negative

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Medium machining</p>	DNMG 150608-MP3			●	○	○				ACP 25 T	10 311673 0114	14,35
	<b>Highly wear-resistant</b>											

3147

Chip breaker MP5 negative

• Note: for DNMG 1104.. Reduction of max. feed ap = 3.0 mm, f = 0.1-0.35 mm/rev

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Medium machining</p>	DNMG 110404-MP5			●		○				ACP 15 T	10 366637 1215	11,50
	DNMG 110404-MP5			●	○	○				ACP 25 T	10 366637 1225	11,50
	DNMG 110408-MP5			●		○				ACP 15 T	10 366637 0115	11,50
	DNMG 110408-MP5			●	○	○				ACP 25 T	10 366637 0225	11,50
	DNMG 110408-MP5			●	○					ACP 35 T	10 366637 0335	11,50
	DNMG 150404-MP5			●	○	○				ACP 25 T	10 366637 1325	13,50
	DNMG 150408-MP5			●	○	○				ACP 25 T	10 366637 1425	13,50
	DNMG 150604-MP5			●		○				ACP 15 T	10 366637 0415	13,75
	DNMG 150604-MP5			●	○	○				ACP 25 T	10 366637 0525	13,75
	DNMG 150604-MP5			●		○				ACP 15 T	10 366637 0615	13,75
	DNMG 150608-MP5			●	○	○				ACP 25 T	10 366637 0725	13,75
	DNMG 150608-MP5			●	○					ACP 35 T	10 366637 0835	13,75
	DNMG 150612-MP5			●		○				ACP 15 T	10 366637 0915	13,75
	DNMG 150612-MP5			●	○	○				ACP 25 T	10 366637 1025	13,75
	DNMG 150612-MP5			●	○					ACP 35 T	10 366637 1135	13,75

3135

ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.50 ap = 0.40 - 3.50	ap = 0.60 - 3.00


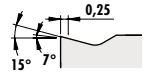
ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 140 - 340	Vc = 120 - 280	Vc = 80 - 220
ISO K cast iron	Vc = 180 - 290	Vc = 150 - 260	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.35 ap = 0.6 - 4.0		

ISO	ACP 25 T
ISO P steel	Vc = 100 - 270
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.45 ap = 1.0 - 4.0

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.5 ap = 0.5 - 5.0		

Continued on next page >>>


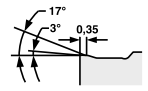
Chip breaker PM negative

F finishing	M medium	R roughing	<b>palbit</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Medium machining</p> 	○	●	-	●		●				PHG 115	10 333621 0164	11,90
				●		●				PHG 125	10 333621 0165	11,90
				●		●				PHG 115	10 333621 0264	11,90
				●		●				PHG 125	10 333621 0265	11,90
				●		●				PHG 115	10 333621 0364	11,90
				●		●				PHG 125	10 333621 0365	11,90
				●		●				PHG 115	10 333621 0464	11,90
				●		●				PHG 125	10 333621 0465	11,90
				●		●				PHG 115	10 333621 0564	12,75
				●		●				PHG 125	10 333621 0565	12,75
				●		●				PHG 115	10 333621 0664	12,75
				●		●				PHG 125	10 333621 0665	12,75

3148

ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 270	Vc = 100 - 240
ISO K cast iron	Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.60 ap = 0.40 - 7.00	

Chip breaker RP5 negative



F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Roughing/medium machining</p> 	-	○	●	●		●				HC 7610	10 311520 1711	13,10
				●		●				HC 7620	10 311520 1712	13,10
				●		●				HC 7630	10 311520 1713	13,10
				●		●				HC 7620	10 311520 1812	13,10

3147

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 200 - 340	Vc = 140 - 290	Vc = 140 - 230
ISO K cast iron	Vc = 250 - 580	Vc = 140 - 490	Vc = 180 - 430
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.35 ap = 0.80 - 5.0		

Chip breaker 02 negative



NEW

F finishing	M medium	R roughing	<b>palbit</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Roughing/medium machining</p> 	-	●	○	●						PHG 115	10 333626 0164	11,90
				●						PHG 125	10 333626 0165	11,90
				●						PHG 115	10 333626 0264	11,90
				●						PHG 125	10 333626 0265	11,90
				●						PHG 115	10 333626 0364	11,90
				●						PHG 125	10 333626 0365	11,90
				●						PHG 115	10 333626 0464	11,90
				●						PHG 125	10 333626 0465	11,90

3148

ISO	PHG 115	PHG 125
ISO P steel	Vc = 100 - 295	Vc = 110 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.14 - 0.50 ap = 0.70 - 5.0	

Chip breaker RP3-HP negative


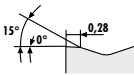
F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Roughing</p> 	-	○	●	●	○	○				ACP 25 T	10 311681 0114	14,35
										<b>Highly wear-resistant</b>		

3147

ISO	ACP 25 T
ISO P steel	Vc = 100 - 250
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.45 ap = 1.0 - 6.0




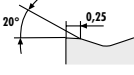
**Chip breaker RP2 negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation										
 <p><b>Roughing</b></p> 	DNMG 150608-RP2	●		○						ACP 15 T	10 366641 0115	13,75	
		●	○	○							ACP 25 T	10 366641 0225	13,75
		●	○								ACP 35 T	10 366641 0335	13,75
	DNMG 150612-RP2	●		○							ACP 15 T	10 366641 0415	13,75
		●	○	○							ACP 25 T	10 366641 0525	13,75
		●	○								ACP 35 T	10 366641 0635	13,75

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.5 ap = 0.5 - 6.0		


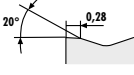
**Chip breaker RP7 negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation										
 <p><b>Roughing</b></p> 	DNMM 150608-RP7	●		○						ACP 15 T	10 366642 0115	13,75	
		●	○	○							ACP 25 T	10 366642 0225	13,75
		●	○								ACP 35 T	10 366642 0335	13,75

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 0.7 ap = 0.5 - 7.0		

**Chip breaker RP8 negative**

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation										
 <p><b>Roughing</b></p> 	DNMM 150612-RP8	●		○						ACP 15 T	10 366643 0115	13,75	
		●	○	○							ACP 25 T	10 366643 0225	13,75
		●	○								ACP 35 T	10 366643 0335	13,75

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 0.8 ap = 1.5 - 8.0		

**Over 200,000 tools available online!**

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



**Register online now!**



**www.saratools.com**

## ISO indexable cutting inserts DN.. ISO M

• 55° rhombic, negative 0°



ISO M

### Chip breaker FM5 negative

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
			DNGP 150404-FM5		●	○	○	○		APM 20 T	10 366631 0120	17,10
			DNGP 150602-FM5		●	○	○	○		APM 20 T	10 366631 0220	17,50
			DNGP 150604-FM5		●	○	○	○		APM 20 T	10 366631 0320	17,50
			DNGP 150608-FM5		●	○	○	○		APM 20 T	10 366631 0420	17,50

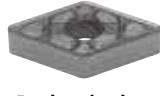
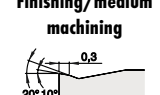
3135

### Chip breaker FM (HC75..) negative

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
			DNMG 110404-FM	○	●			○		HC 7510	10 310253 2324	10,95
					●			○		HC 7520	10 310253 2325	10,95


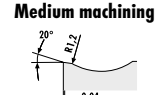
3147

### Chip breaker SF negative

F finishing	M medium	R roughing	palbit®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
			DNMG 110404-SF		●					PHS 215	10 333618 0371	8,75
			DNMG 110408-SF		●					PHS 225	10 333618 0472	8,75
			DNMG 110408-SF		●					PHS 215	10 333618 0771	8,75
			DNMG 150404-SF		●					PHS 215	10 333618 1171	11,90
			DNMG 150408-SF		●					PHS 225	10 333618 1272	11,90
			DNMG 150408-SF		●					PHS 215	10 333618 1571	11,90
			DNMG 150408-SF		●					PHS 225	10 333618 1672	11,90
			DNMG 150412-SF		●					PHS 215	10 333618 1971	11,90
			DNMG 150412-SF		●					PHS 225	10 333618 2072	11,90
			DNMG 150604-SF		●					PHS 215	10 333618 2371	12,75
			DNMG 150604-SF		●					PHS 225	10 333618 2472	12,75
			DNMG 150608-SF		●					PHS 215	10 333618 2771	12,75
			DNMG 150608-SF		●					PHS 225	10 333618 2872	12,75
			DNMG 150612-SF		●					PHS 215	10 333618 3171	12,75
			DNMG 150612-SF		●					PHS 225	10 333618 3272	12,75

3148

### Chip breaker MM (HC75..) negative

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
			DNMG 110404-MM		●			○		HC 7530	10 310257 2326	10,95
			DNMG 110408-MM		●			○		HC 7520	10 310257 2425	10,95
			DNMG 110408-MM		●			○		HC 7530	10 310257 2426	10,95
			DNMG 150604-MM		●			○		HC 7520	10 310257 3025	13,10
			DNMG 150604-MM		●			○		HC 7530	10 310257 3026	13,10
			DNMG 150608-MM		●			○		HC 7520	10 310257 3125	13,10

3147

ISO	APM 20 T
ISO M stainless steel	Vc = 60 - 200
ISO K cast iron	Vc = 120 - 220
ISO N Al/non-ferrous	Vc = 100 - 600
ISO S superalloys	Vc = 15 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.2 ap = 0.14 - 2.5

ISO	HC 7510	HC 7520
ISO P steel	Vc = 140 - 320	
ISO M stainless steel	Vc = 175 - 270	Vc = 170 - 260
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.12 ap = 0.2 - 1.0	

ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 80 - 290	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.55 ap = 0.60 - 3.0	

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 150 - 240	Vc = 130 - 200
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.35 ap = 0.6 - 5.0	

NEW

Chip breaker GS negative

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation		●			●		PHH 920	10 333578 0794	9,05
<p>Medium machining</p>												
			DNMG 110404-GS		●			●		PHH 910	10 333578 0795	9,05
			DNMG 110408-GS		●			●		PHH 920	10 333578 0894	9,05
			DNMG 150404-GS		●			●		PHH 910	10 333578 0895	9,05
			DNMG 150408-GS		●			●		PHH 920	10 333578 0194	11,90
			DNMG 150408-GS		●			●		PHH 910	10 333578 0195	11,90
			DNMG 150412-GS		●			●		PHH 920	10 333578 0294	11,90
			DNMG 150412-GS		●			●		PHH 910	10 333578 0295	11,90
			DNMG 150604-GS		●			●		PHH 920	10 333578 0394	11,90
			DNMG 150604-GS		●			●		PHH 910	10 333578 0395	11,90
			DNMG 150608-GS		●			●		PHH 920	10 333578 0494	13,50
			DNMG 150608-GS		●			●		PHH 910	10 333578 0495	13,50
			DNMG 150612-GS		●			●		PHH 920	10 333578 0594	13,50
			DNMG 150612-GS		●			●		PHH 910	10 333578 0595	13,50
			DNMG 150612-GS		●			●		PHH 920	10 333578 0694	13,50
			DNMG 150612-GS		●			●		PHH 910	10 333578 0695	13,50

3148

Chip breaker MM5 negative

• Note: for DNMG 1104.. Reduction of max. feed ap = 3.0 mm, f = 0.1-0.35 mm/rev

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation	○	●					APM 25 T	10 366634 0121	11,50
<p>Medium machining</p>												
			DNMG 110404-MM5	○	●					APM 25 T	10 366634 0221	11,50
			DNMG 150604-MM5	○	●					APM 25 T	10 366634 0321	13,75
			DNMG 150608-MM5	○	●					APM 25 T	10 366634 0421	13,75

3135

Chip breaker SM2-HP negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation	○	●					ACM 20 T	10 311678 0112	14,35
<p>Roughing/medium machining</p>												
			DNMG 150604-SM2	○	●					ACM 20 T	10 311678 0212	14,35
			DNMG 150608-SM2	○	●					ACM 20 T	10 311678 0212	14,35

Highly wear-resistant

3147

Chip breaker SS negative

NEW

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	●	ISO designation		●					PHS 215	10 333623 0471	11,90
<p>Roughing/medium machining</p>												
			DNMG 150404-SS		●					PHS 225	10 333623 0472	11,90
			DNMG 150408-SS		●					PHS 215	10 333623 0971	11,90
			DNMG 150412-SS		●					PHS 225	10 333623 0972	11,90
			DNMG 150412-SS		●					PHS 215	10 333623 1371	11,90
			DNMG 150604-SS		●					PHS 225	10 333623 1372	11,90
			DNMG 150604-SS		●					PHS 215	10 333623 1871	12,75
			DNMG 150604-SS		●					PHS 225	10 333623 1872	12,75
			DNMG 150608-SS		●					PHS 215	10 333623 2371	12,75
			DNMG 150608-SS		●					PHS 225	10 333623 2372	12,75
			DNMG 150612-SS		●					PHS 215	10 333623 2871	12,75
			DNMG 150612-SS		●					PHS 225	10 333623 2872	12,75

3148

ISO	PHH 910	PHH 920
ISO M stainless steel	Vc = 130 - 250	Vc = 110 - 220
ISO S superalloys	Vc = 25 - 70	Vc = 20 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.35 ap = 0.15 - 3.0	

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.14 - 0.4 ap = 0.25 - 4.0

ISO	ACM 20 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.4 ap = 1.0 - 4.2

ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 55 - 240	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 1.0 ap = 0.3 - 6.4	

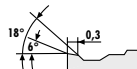
Continued on next page >>>

Chip breaker RM5 negative

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	DNMG 150608-RM5	○	●					APM 25 T	10 366640 0121	13,75
			DNMG 150612-RM5	○	●					APM 25 T	10 366640 0221	13,75



Roughing



3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.25 - 0.5 ap = 0.5 - 6.0

ISO indexable cutting inserts DN.. ISO K

• 55° rhombic, negative 0°

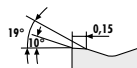


Chip breaker MK negative

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	DNMG 150608-MK	○		●				ACK 20 T	10 366632 0130	13,75
			DNMG 150612-MK	○		●				ACK 20 T	10 366632 0230	13,75



Medium machining



3135

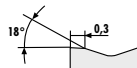
ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.5 ap = 0.25 - 5.0

Chip breaker RK2 negative

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	DNMG 150608-RK2	○		●				ACK 20 T	10 366638 0130	13,75



Roughing



3135



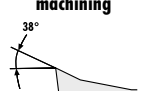
ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.5 ap = 1.0 - 6.0

## ISO indexable cutting inserts DN.. ISO N

**ISO N**

• 55° rhombic, negative 0°

### Chip breaker NS negative




F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	●	-	ISO designation				●			LT 05	10 340002 0101	11,-
				DNMG 110404-NS			●			LT 05	10 340002 0201	11,-
<b>Finishing/medium machining</b>												
												

3135

ISO	LT 05
<b>ISO N</b> Al/non-ferrous	Vc = 600 - 1200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.30 ap = 0.25 - 5.0

### Chip breaker MS negative

**NEW**

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation				●			PH 0910	10 333617 0120	10,30
				DNMG 150404-MS			●			PH 0910	10 333617 0320	10,30
<b>Medium machining</b>				DNMG 150412-MS			●			PH 0910	10 333617 0520	10,30
				DNMG 150604-MS			●			PH 0910	10 333617 0820	10,85
				DNMG 150608-MS			●			PH 0910	10 333617 1020	10,85

3148



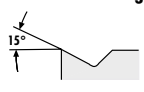
ISO	PH 0910
<b>ISO N</b> Al/non-ferrous	Vc = 35 - 630
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.60 ap = 0.20 - 4.0

## ISO indexable cutting inserts DN.. ISO S

**ISO S**

• 55° rhombic, negative 0°




### Chip breaker MS1 negative

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation		○			●		APS 10 T	10 366639 0132	13,75
				DNMG 150608-MS1		○		●		APS 15 T	10 366639 0231	13,75
<b>Medium machining</b>												
												

3135

ISO	APS 10 T	APS 15 T
<b>ISO M</b> stainless steel	Vc = 60 - 230	Vc = 50 - 220
<b>ISO S</b> superalloys	Vc = 30 - 120	Vc = 30 - 120
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.3 ap = 0.4 - 3.0	

### Chip breaker MS2-HP negative

F finishing	M medium	R roughing		ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation		○			●		ACM 20 T	10 311684 0114	14,35
				DNMG 150608-MS2		○		●		ACM 20 T	10 311684 0114	14,35
<b>Medium machining</b>												
												
<b>Highly wear-resistant</b>												

3147

ISO	ACM 20 T
<b>ISO M</b> stainless steel	Vc = 100 - 250
<b>ISO S</b> superalloys	Vc = 30 - 120
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.3 ap = 0.4 - 3.0


## ISO indexable cutting inserts KNUX ISO P

**ISO P**

- 55° rhombic, negative 0°

### Chip breaker SR right-hand version

- **Note:**
- **RH** insert = **right-hand** tool holder or **left-hand** boring bar
- **LH** insert = **left-hand** tool holder or **right-hand** boring bar


F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation	●	○	○						
			KNUX 160405-SR	●	○	○				ACP 25 T	10 366645 0125	12,65
				●	○	○				ACU 20 T	10 366645 0350	12,65
				●	○	○				ACU 40 T	10 366645 0455	12,65
			KNUX 160410-SR	●	○	○				ACP 25 T	10 366645 0225	12,65

3135

ISO	ACP 25 T	ACU 20 T	ACU 40 T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200	Vc = 90 - 180
ISO M stainless steel	Vc = 70 - 210	Vc = 90 - 180	Vc = 50 - 160
ISO K cast iron	Vc = 130 - 250		
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.6 ap = 0.5 - 4.8		

### Chip breaker SL left-hand version

- **Note:**
- **RH** insert = **right-hand** tool holder or **left-hand** boring bar
- **LH** insert = **left-hand** external tool holder or **right-hand** boring bar

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation	●	○	○						
			KNUX 160405-SL	●	○	○				ACP 25 T	10 366644 0125	12,65
				●	○	○				ACU 20 T	10 366644 0350	12,65
				●	○	○				ACU 40 T	10 366644 0455	12,65
			KNUX 160410-SL	●	○	○				ACP 25 T	10 366644 0225	12,65

3135

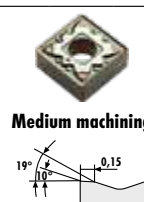
ISO	ACP 25 T	ACU 20 T	ACU 40 T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200	Vc = 90 - 180
ISO M stainless steel	Vc = 70 - 210	Vc = 90 - 180	Vc = 50 - 160
ISO K cast iron	Vc = 130 - 250		
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.6 ap = 0.5 - 4.8		

## ISO indexable cutting inserts SN.. ISO P

**ISO P**

- 90° square, negative 0°

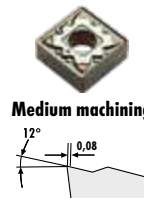
### Chip breaker MP5 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation	●	○	○						
			SNMG 120408-MP5	●	○	○				ACP 25 T	10 366655 0225	10,-
				●	○	○				ACP 35 T	10 366655 0235	10,-
				●	○	○				ACP 15 T	10 366655 0435	10,-
			SNMG 120412-MP5	●	○	○				ACP 15 T	10 366655 0115	10,-
				●	○	○				ACP 25 T	10 366655 0325	10,-
				●	○	○				ACP 35 T	10 366655 0535	10,-

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.4 ap = 0.5 - 5.0		

### Chip breaker MP3-HP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation	●	○	○						
			SNMG 120408-MP3	●	○	○				ACP 25 T	10 311674 0114	10,50

**Highly wear-resistant**

3147

ISO	ACP 25 T
ISO P steel	Vc = 100 - 270
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.45 ap = 1.0 - 4.0

NEW

Chip breaker PM negative

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	-	-	ISO designation										
<p>Medium machining</p>	SNMG 120404-PM			●		●				PHG 115	10 333683 0164	8,70	
	SNMG 120408-PM			●		●					PHG 125	10 333683 0165	8,70
	SNMG 120412-PM			●		●					PHG 115	10 333683 0264	8,70
	SNMG 120412-PM			●		●					PHG 125	10 333683 0265	8,70
SNMG 120412-PM			●		●					PHG 115	10 333683 0364	8,70	
SNMG 120412-PM			●		●					PHG 125	10 333683 0365	8,70	

3148

Chip breaker RP1 negative

• ap up to 11 mm possible for SNMG 1906..

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation										
<p>Roughing/medium machining</p>	SNMG 150612-RP1			●	○	○				ACP 25 T	10 366658 0125	15,40	
	SNMG 150612-RP1			●	○	○					ACP 35 T	10 366658 0235	15,40
	SNMG 190612-RP1			●	○	○					ACP 25 T	10 366658 0325	21,40
	SNMG 190612-RP1			●	○	○					ACP 35 T	10 366658 0435	21,40

3135

Chip breaker RP2 negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
<p>Roughing/medium machining</p>	SNMG 120408-RP2			●	○	○				ACP 25 T	10 366657 0125	10,-

3135

Chip breaker RP8 negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	○	●	ISO designation										
<p>Roughing</p>	SNMM 190612-RP8			●	○	○				ACP 25 T	10 366659 0125	21,40	
	SNMM 190616-RP8			●	○	○					ACP 25 T	10 366659 0225	21,40
	SNMM 250724-RP8			●	○	○					ACP 25 T	5 366659 0325	39,10
	SNMM 250924-RP8			●	○	○					ACP 25 T	5 366659 0425	44,10

3135

Chip breaker RP9 negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	-	●	ISO designation										
<p>Roughing</p>	SNMM 190616-RP9			●	○	○				ACP 25 T	10 366660 0125	21,40	
	SNMM 190624-RP9			●	○	○					ACP 25 T	10 366660 0225	21,40
	SNMM 250924-RP9			●	○	○					ACP 25 T	5 366660 0325	44,10
	SNMM 250932-RP9			●	○	○					ACP 25 T	5 366660 0425	44,10

3135

ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 270	Vc = 100 - 240
ISO K cast iron	Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.6 ap = 0.4 - 6.0	

ISO	ACP 25 T	ACP 35 T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.7 ap = 1.0 - 7.5	

ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 6.0

ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 0.8 ap = 1.5 - 10.5

ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 1.4 ap = 2.5 - 13.0

Continued on next page >>>

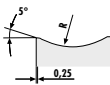


Chip breaker RP10 negative

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	-	•	SNMM 190616-RP10	●	○	○				ACP 25 T	10 366661 0125	21,40
			SNMM 250924-RP10	●	○	○				ACP 25 T	5 366661 0225	44,10



Roughing



ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 100 - 240
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 1.2 ap = 2.5 - 12.0

3135

ISO indexable cutting inserts SNMX R 1-4

- 90° square, negative 0°
- **Note: When using indexable cutting inserts with radius > 3 mm, the insert seat must be modified**
- Suitable for PSSN clamp mounting
- With 8 cutting edges
- **Main application: ISO P**
- Feed f: 0.1 - 0.2 mm/rev
- Cutting speed Vc: 50 - 120m/min

Radius indexable turning insert



ISO designation	Quality	r mm	art.no.	€
SNMX 120408 R1	SWP 25 T	1.0	311686 1201	41,70
SNMX 120408 R2	SWP 25 T	2.0	311686 1202	41,70
SNMX 120408 R3	SWP 25 T	3.0	311686 1203	41,70
SNMX 120408 R4	SWP 25 T	4.0	311686 1204	41,70
SNMX 120408 R1-4	SWP 25 T	1.0-4.0	311686 1234	41,70

3164

**EVEN WORKS BACKWARDS.**

**SIMPLY INPUT THE DIMENSIONS, AND YOU'RE DONE:**

**CLAMPING JAWS FINDER**

**THAT'S POWER TO PRODUCE**


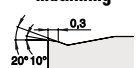
**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE

## ISO indexable cutting inserts SN.. ISO M

• 90° square, negative 0°


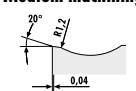
ISO M

## Chip breaker SF negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Finishing/medium machining</p> 	SNMG 120404-SF				●					PHS 215	10 333635 0371	8,70
	SNMG 120408-SF				●					PHS 225	10 333635 0472	8,70
	SNMG 120412-SF				●					PHS 215	10 333635 0771	8,70
					●					PHS 225	10 333635 0872	8,70
					●					PHS 215	10 333635 1171	8,70
				●					PHS 225	10 333635 1272	8,70	


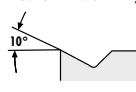
3148

## Chip breaker MM negative

F finishing	M medium	R roughing	<b>ATORN</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
 <p>Medium machining</p> 	SNMG 120408-MM				●			○		HC 7520	10 310451 2725	9,55
	SNMG 120412-MM				●				○		HC 7530	10 310451 2826


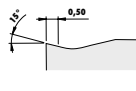
3147

## Chip breaker MM5 negative

F finishing	M medium	R roughing	<b>ATORN</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation									
 <p>Medium machining</p> 	SNMG 120408-MM5			○	●					APM 25 T	10 366656 0121	10,-


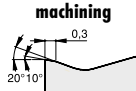
3135

## Chip breaker GS negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Medium machining</p> 	SNMG 120408-GS				●			●		PHH 920	10 333580 0194	9,05
					●				●		PHH 910	10 333580 0195

3148

## Chip breaker SS negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	●	ISO designation									
 <p>Roughing/medium machining</p> 	SNMG 120404-SS				●					PHS 225	10 333637 0572	8,70
	SNMG 120408-SS				●					PHS 225	10 333637 0872	8,70
	SNMG 120412-SS				●					PHS 225	10 333637 1172	8,70

3148

ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 80 - 290	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.55 ap = 1.0 - 4.0	

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 150 - 240	Vc = 130 - 200
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.25 ap = 0.8 - 3.0	

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.4 ap = 0.5 - 5.0

ISO	PHH 910	PHH 920
ISO M stainless steel	Vc = 130 - 250	Vc = 110 - 220
ISO S superalloys	Vc = 25 - 70	Vc = 20 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.50 ap = 0.50 - 4.0	


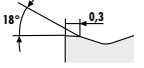
ISO	PHS 225
ISO M stainless steel	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.8 ap = 0.5 - 8.0

## ISO indexable cutting inserts SN.. ISO K

• 90° square, negative 0°

**ISO K**


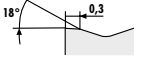
### Chip breaker RK2 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation			●				ACK 20 T	10 366653 0130	10,-
 <p><b>Roughing/medium machining</b></p> 		SNMG 120408-RK2										

3135

ISO	ACK 20 T
<b>ISO P</b> steel	Vc = 150 - 340
<b>ISO K</b> cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.6 ap = 0.5 - 7.5


### Chip breaker RK3-HP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation			●				ACK 10 T	10 311680 0411	10,50
 <p><b>Roughing</b></p> 		SNMG 120412-RK3										
<b>Highly wear-resistant</b>												

3147

ISO	ACK 10 T
<b>ISO P</b> steel	Vc = 170 - 400
<b>ISO K</b> cast iron	Vc = 170 - 450
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 0.5 ap = 2.0 - 4.8

### Chip breaker RK negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation			●				ACK 20 T	10 366652 0130	10,-
 <p><b>Roughing</b></p>		SNMA 120408-RK										

3135



ISO	ACK 20 T
<b>ISO P</b> steel	Vc = 150 - 340
<b>ISO K</b> cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 7.0

## ISO indexable cutting inserts SN.. ISO S

• 90° square, negative 0°

**ISO S**

### Chip breaker MS1 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation		○			●		APS 10 T	10 366654 0132	10,-
 <p><b>Medium machining</b></p> 		SNMG 120408-MS1										
										APS 15 T	10 366654 0231	10,-

3135

ISO	APS 10 T	APS 15 T
<b>ISO M</b> stainless steel	Vc = 60 - 230	Vc = 50 - 220
<b>ISO S</b> superalloys	Vc = 30 - 120	Vc = 30 - 120
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.3 ap = 0.5 - 3.0	

# ISO indexable cutting inserts TN.. ISO P

• 60° triangular, negative 0°

**ISO P**

**NEW**

## Chip breaker LC negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
•	•	-	<b>ISO designation</b>									
<p><b>Finishing/medium machining</b></p>	TNMG 160404-LC	●								PHG 115	10 333649 0164	8,75
			●							PHG 125	10 333649 0165	8,75
	TNMG 160408-LC	●								PHG 115	10 333649 0264	8,75
			●							PHG 125	10 333649 0265	8,75
	TNMG 160412-LC	●								PHG 115	10 333649 0364	8,75
			●							PHG 125	10 333649 0365	8,75
TNMG 220408-LC	●									PHG 115	10 333649 0464	13,-
		●								PHG 125	10 333649 0465	13,-

3148

ISO	PHG 115	PHG 125
<b>ISO P</b> steel	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.5 ap = 0.4 - 3.5	

## Chip breaker MP5 negative

F finishing	M medium	R roughing	<b>ATORN</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	•	○	<b>ISO designation</b>									
<p><b>Medium machining</b></p>	TNMG 160404-MP5	●		○						ACP 15 T	10 366670 0115	10,-
			●	○						ACP 25 T	10 366670 0225	10,-
	TNMG 160408-MP5	●		○						ACP 15 T	10 366670 0415	10,-
			●	○						ACP 25 T	10 366670 0525	10,-
			●	○						ACP 35 T	10 366670 0635	10,-
	TNMG 160412-MP5	●		○						ACP 15 T	10 366670 0715	10,-
		●	○						ACP 25 T	10 366670 0825	10,-	
TNMG 220404-MP5	●		○							ACP 25 T	10 366670 0925	14,55
TNMG 220408-MP5	●		○							ACP 25 T	10 366670 1025	14,55

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
<b>ISO P</b> steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
<b>ISO M</b> stainless steel		Vc = 70 - 210	Vc = 55 - 200
<b>ISO K</b> cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5		

## Chip breaker MP3-HP negative

F finishing	M medium	R roughing	<b>ATORN</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	•	-	<b>ISO designation</b>									
<p><b>Medium machining</b></p>	TNMG 160408-MP3	●	○							ACP 25 T	10 311675 0114	10,50
	<b>Highly wear-resistant</b>											

3147

ISO	ACP 25 T
<b>ISO P</b> steel	Vc = 100 - 270
<b>ISO M</b> stainless steel	Vc = 70 - 210
<b>ISO K</b> cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.45 ap = 1.0 - 4.0

## Chip breaker PM negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	•	-	<b>ISO designation</b>									
<p><b>Finishing/medium machining</b></p>	TNMG 160404-PM	●		●						PHG 115	10 333651 0164	8,70
			●		●					PHG 125	10 333651 0165	8,70
	TNMG 160408-PM	●		●						PHG 115	10 333651 0264	8,70
			●		●					PHG 125	10 333651 0265	8,70
	TNMG 160412-PM	●		●						PHG 115	10 333651 0364	8,70
			●		●					PHG 125	10 333651 0365	8,70
	TNMG 160416-PM	●		●						PHG 115	10 333651 0464	8,70
			●		●					PHG 125	10 333651 0465	8,70
	TNMG 220404-PM	●		●						PHG 115	10 333651 0564	13,-
			●		●					PHG 125	10 333651 0565	13,-
	TNMG 220408-PM	●		●						PHG 115	10 333651 0664	13,-
			●		●					PHG 125	10 333651 0665	13,-
TNMG 220412-PM	●		●						PHG 115	10 333651 0764	13,-	
		●		●					PHG 125	10 333651 0765	13,-	
TNMG 220416-PM	●		●						PHG 115	10 333651 0864	13,-	
		●		●					PHG 125	10 333651 0865	13,-	

3148

ISO	PHG 115	PHG 125
<b>ISO P</b> steel	Vc = 110 - 350	Vc = 100 - 295
<b>ISO K</b> cast iron	Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.60 ap = 0.30 - 9.00	

Continued on next page >>>

Chip breaker RP1 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
<p><b>Roughing</b></p>			TNMG 220412-RP1	●	○	○				ACP 25 T	10 <b>366676</b> 0125	<b>14,55</b>

3135

ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 130 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.5 ap = 0.5 - 5.0

Chip breaker RP2 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
<p><b>Roughing</b></p>			TNMG 160408-RP2	●	○	○				ACP 25 T	10 <b>366674</b> 0125	<b>10,-</b>
			TNMG 160412-RP2	●	○	○				ACP 25 T	10 366674 0325	<b>10,-</b>

3135

ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 6.0

ISO indexable cutting inserts TN.. ISO M

- 60° triangular, negative 0°

ISO M

Chip breaker SF negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
<p><b>Finishing/medium machining</b></p>			TNMG 160404-SF		●					PHS 215	10 <b>333648</b> 0371	<b>8,75</b>
			TNMG 160408-SF		●					PHS 225	10 333648 0472	<b>8,75</b>
			TNMG 160412-SF		●					PHS 215	10 333648 0771	<b>8,75</b>
			TNMG 160412-SF		●					PHS 225	10 333648 0872	<b>8,75</b>
			TNMG 160412-SF		●					PHS 215	10 333648 1171	<b>8,75</b>
			TNMG 160412-SF		●					PHS 225	10 333648 1272	<b>8,75</b>
			TNMG 220404-SF		●					PHS 215	10 333648 1571	<b>13,-</b>
			TNMG 220404-SF		●					PHS 225	10 333648 1672	<b>13,-</b>
			TNMG 220408-SF		●					PHS 215	10 333648 1971	<b>13,-</b>
			TNMG 220408-SF		●					PHS 225	10 333648 2072	<b>13,-</b>
			TNMG 220412-SF		●					PHS 215	10 333648 2371	<b>13,-</b>
			TNMG 220412-SF		●					PHS 225	10 333648 2472	<b>13,-</b>

3148

ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 80 - 290	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.55 ap = 0.6 - 3.0	

Chip breaker MM (HC75..) negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
<p><b>Medium machining</b></p>			TNMG 160408-MM		●			○		HC 7520	10 <b>310557</b> 3825	<b>9,55</b>
			TNMG 160408-MM		●			○		HC 7530	10 310557 3826	<b>9,55</b>

3147

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 150 - 240	Vc = 130 - 200
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.35 ap = 0.6 - 4.0	

NEW

Chip breaker GS negative

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
<p>Medium machining</p>			TNMG 160404-GS		●			●		PHH 920	10 333581 0194	9,05
			TNMG 160408-GS		●			●		PHH 910	10 333581 0195	9,05
			TNMG 160412-GS		●			●		PHH 920	10 333581 0294	9,05
			TNMG 160412-GS		●			●		PHH 910	10 333581 0295	9,05
			TNMG 160412-GS		●			●		PHH 920	10 333581 0394	9,05
			TNMG 160412-GS		●			●		PHH 910	10 333581 0395	9,05

3148

ISO	PHH 910	PHH 920
ISO M stainless steel	Vc = 130 - 250	Vc = 110 - 220
ISO S superalloys	Vc = 25 - 70	Vc = 20 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.50 ap = 0.50 - 4.0	

Chip breaker MM5 negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation									
<p>Roughing/medium machining</p>			TNMG 160404-MM5	○	●					APM 25 T	10 366669 0121	10,-
			TNMG 160408-MM5	○	●						APM 25 T	10 366669 0221

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.4 ap = 0.5 - 5.0

Chip breaker SS negative

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€		
-	●	●	ISO designation											
<p>Roughing/medium machining</p>			TNMG 160404-SS		●					PHS 215	10 333653 0171	8,75		
			TNMG 160408-SS		●						PHS 225	10 333653 0172	8,75	
			TNMG 160412-SS		●							PHS 215	10 333653 0671	8,75
			TNMG 160412-SS		●							PHS 225	10 333653 0723	7,60
			TNMG 220408-SS		●							PHS 215	10 333653 1171	8,75
			TNMG 220408-SS		●							PHS 225	10 333653 1172	8,75
			TNMG 220412-SS		●					PHS 215	10 333653 1671	13,-		
			TNMG 220412-SS		●					PHS 225	10 333653 1672	13,-		
			TNMG 220412-SS		●					PHS 225	10 333653 2172	13,-		

3148

ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 55 - 240	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 1.0 ap = 0.3 - 8.5	

Chip breaker RM5 negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
<p>Roughing/medium machining</p>			TNMG 160408-RM5	○	●					APM 25 T	10 366675 0221	10,-
			TNMG 160412-RM5	○	●						APM 25 T	10 366675 0121

3135


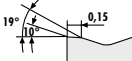
ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.6 ap = 0.5 - 6.0

## ISO indexable cutting inserts TN.. ISO K

- 60° triangular, negative 0°

ISO K


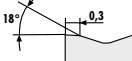
## Chip breaker MK negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	•	○	ISO designation									
 <p>Roughing/medium machining</p> 			TNMG 160408-MK	○		●				ACK 20 T	10 366673 0130	10,-
			TNMG 160612-MK	○		●				ACK 20 T	10 366673 0230	10,-
			TNMG 220408-MK	○		●				ACK 20 T	10 366673 0330	14,55

3135

ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.5 ap = 0.25 - 4.0

## Chip breaker RK2 negative


F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
 <p>Roughing/medium machining</p> 			TNMG 160408-RK2	○		●				ACK 20 T	10 366671 0130	10,-

3135

ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.5 ap = 0.5 - 6.0

## Chip breaker RK negative

- Without chip breaker version

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
 <p>Roughing</p>			TNMA 160408-RK	○		●				ACK 20 T	10 366668 0130	10,-

3135

ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 7.0



## ISO indexable cutting inserts TN.. ISO N

- 60° triangular, negative 0°

ISO N

NEW

## Chip breaker MS negative

F finishing	M medium	R roughing	<b>palbit®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Medium machining</p> 			TNMG 160404-MS				●			PH 0910	10 333647 0120	7,60
			TNMG 160408-MS				●			PH 0910	10 333647 0320	7,60
			TNMG 160412-MS				●			PH 0910	10 333647 0520	7,60

3148

ISO	PH 0910
ISO N Al/non-ferrous	Vc = 35 - 630
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.60 ap = 0.30 - 3.8





## ISO indexable cutting inserts TN.. ISO S

**ISO S**

• 60° triangular, negative 0°

### Chip breaker MS1 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation		○			●		APS 10 T	10 366672 0132	10,-
 <p>Finishing/medium machining</p> 			TNMG 160408-MS1		○			●		APS 15 T	10 366672 0231	10,-

3135


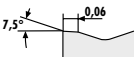
ISO	APS 10 T	APS 15 T
<b>ISO M</b> stainless steel	Vc = 60 - 230	Vc = 50 - 220
<b>ISO S</b> superalloys	Vc = 30 - 120	Vc = 30 - 120
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.3 ap = 0.5 - 3.0	

## ISO indexable cutting inserts VN.. ISO P

**ISO P**

• 35° rhombic, negative 0°


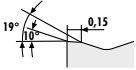
### Chip breaker FP1 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation	●		○				ACP 15 T	10 366686 0115	14,60
 <p>Finishing</p> 			VNMG 160404-FP1									

3135

ISO	ACP 15 T
<b>ISO P</b> steel	Vc = 180 - 400
<b>ISO K</b> cast iron	Vc = 140 - 520
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.2 - 2.5

### Chip breaker MP5 negative


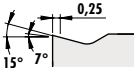
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€		
○	●	-	ISO designation	●		○				ACP 15 T	10 366685 0115	14,60		
 <p>Medium machining</p> 			VNMG 160404-MP5		○					ACP 25 T	10 366685 0225	14,60		
			VNMG 160408-MP5		○						ACP 15 T	10 366685 0415	14,60	
					○							ACP 25 T	10 366685 0525	14,60

3135

ISO	ACP 15 T	ACP 25 T
<b>ISO P</b> steel	Vc = 180 - 400	Vc = 180 - 400
<b>ISO M</b> stainless steel		Vc = 70 - 210
<b>ISO K</b> cast iron	Vc = 140 - 520	Vc = 130 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5	

### Chip breaker PM negative

**NEW**

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€		
○	●	-	ISO designation	●		●				PHG 115	10 333687 0164	12,20		
 <p>Medium machining</p> 			VNMG 160404-PM			●				PHG 125	10 333687 0165	12,20		
			VNMG 160408-PM			●					PHG 115	10 333687 0264	12,20	
					●							PHG 125	10 333687 0265	12,20

3148


ISO	PHG 115	PHG 125
<b>ISO P</b> steel	Vc = 110 - 270	Vc = 100 - 240
<b>ISO K</b> cast iron	Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.5 ap = 1.0 - 4.0	

# ISO indexable cutting inserts VN.. ISO M

**ISO M**

• 35° rhombic, negative 0°

## Chip breaker FM5 negative

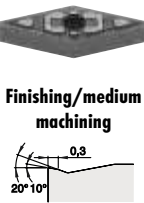
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Micro finishing</p>	VNGP 160402-FM5				●	○	○	○		APM 20 T	10 366684 0120	23,70
	VNGP 160404-FM5				●	○	○	○		APM 20 T	10 366684 0220	23,70

3135

ISO	APM 20 T
<b>ISO M</b> stainless steel	Vc = 60 - 200
<b>ISO K</b> cast iron	Vc = 120 - 220
<b>ISO N</b> Al/non-ferrous	Vc = 100 - 600
<b>ISO S</b> superalloys	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.2 ap = 0.14 - 2.5

## Chip breaker SF negative


**NEW**

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Finishing/medium machining</p>	VNMG 160404-SF				●					PHS 215	10 333660 0371	12,20
	VNMG 160408-SF				●					PHS 225	10 333660 0472	12,20
	VNMG 160412-SF				●					PHS 215	10 333660 0771	12,20
	VNMG 160412-SF				●					PHS 225	10 333660 0872	12,20

3148

ISO	PHS 215	PHS 225
<b>ISO M</b> stainless steel	Vc = 80 - 290	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.55 ap = 0.6 - 3.0	

## Chip breaker MM5 negative

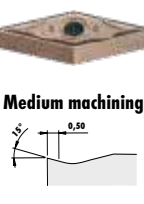
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Medium machining</p>	VNMG 160408-MM5			○	●					APM 25 T	10 366688 0121	14,60

3135

ISO	APM 25 T
<b>ISO P</b> steel	Vc = 60 - 250
<b>ISO M</b> stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.14 - 0.4 ap = 0.25 - 4.0

## Chip breaker GS negative

**NEW**

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Medium machining</p>	VNMG 160404-GS				●			●		PHH 920	10 333582 0194	12,75
	VNMG 160408-GS				●			●		PHH 910	10 333582 0195	12,75
	VNMG 160412-GS				●			●		PHH 920	10 333582 0294	12,75
	VNMG 160412-GS				●			●		PHH 910	10 333582 0295	12,75

3148

ISO	PHH 910	PHH 920
<b>ISO M</b> stainless steel	Vc = 130 - 250	Vc = 110 - 220
<b>ISO S</b> superalloys	Vc = 25 - 70	Vc = 20 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.50 ap = 0.50 - 4.0	


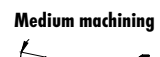

## ISO indexable cutting inserts VN.. ISO N

NEW

- 35° rhombic, negative 0°

ISO N

## Chip breaker MS negative

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	<b>ISO designation</b>									
			VNMG 160404-MS				●			PH 0910	10 333659 0120	10,55
			VNMG 160408-MS				●			PH 0910	10 333659 0320	10,55
<b>Medium machining</b> 												

3148




ISO	PH 0910
<b>ISO N</b> Al/non-ferrous	Vc = 35 - 630
Vc = [m/min]	f = 0.10 - 0.40
f = [mm/U]	ap = 0.20 - 4.0
ap = [mm]	

## ISO indexable cutting inserts WN.. ISO P

- 80° trigometric, negative 0°

ISO P



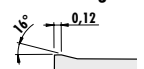
## Chip breaker FP1 negative

F finishing	M medium	R roughing	<b>ATORN</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	<b>ISO designation</b>									
			WNMG 060404-FP1	●		○				ACP 15 T	10 366696 0115	9,45
			WNMG 080404-FP1	●		○				ACP 15 T	10 366696 0215	10,-
<b>Finishing</b> 												

3135

ISO	ACP 15 T
<b>ISO P</b> steel	Vc = 180 - 400
<b>ISO K</b> cast iron	Vc = 140 - 520
Vc = [m/min]	f = 0.08 - 0.25
f = [mm/U]	ap = 0.25 - 2.5
ap = [mm]	

## Chip breaker FP2 negative



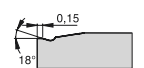
F finishing	M medium	R roughing	<b>ATORN</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	<b>ISO designation</b>									
			WNMX 080404-FP2	●		○				ACP 15 T	10 366707 0115	9,30
			WNMX 080408-FP2	●		○				ACP 15 T	10 366707 0215	9,30
<b>Finishing</b> 												

3135

ISO	ACP 15 T
<b>ISO P</b> steel	Vc = 180 - 400
<b>ISO K</b> cast iron	Vc = 140 - 520
Vc = [m/min]	f = 0.1 - 0.8
f = [mm/U]	ap = 0.5 - 5.0
ap = [mm]	

## Chip breaker LC negative

NEW


F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	●	-	<b>ISO designation</b>									
			WNMG 080408-LC	●						PHG 115	10 333670 0164	10,-
				●						PHG 125	10 333670 0165	10,-
<b>Finishing/medium machining</b> 												

3148

ISO	PHG 115	PHG 125
<b>ISO P</b> steel	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min]	f = 0.10 - 0.35	
f = [mm/U]	ap = 0.40 - 2.50	
ap = [mm]		

Continued on next page &gt;&gt;&gt;

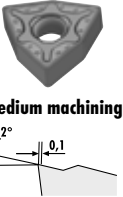
Chip breaker MP5 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	•	-	ISO designation										
 <p>Medium machining</p>	WNNMG 060404-MP5	•		○						ACP 15 T	10 366695 0115	9,45	
		•	○							ACP 25 T	10 366695 0225	9,45	
	WNNMG 060408-MP5	•		○							ACP 15 T	10 366695 0415	9,45
		•	○								ACP 25 T	10 366695 0525	9,45
	WNNMG 080404-MP5	•		○							ACP 15 T	10 366695 0715	10,-
		•	○								ACP 25 T	10 366695 0825	10,-
	WNNMG 080408-MP5	•		○							ACP 15 T	10 366695 1015	10,-
		•	○								ACP 25 T	10 366695 1125	10,-
	WNNMG 080412-MP5	•		○							ACP 15 T	10 366695 1315	10,-
		•	○								ACP 25 T	10 366695 1425	10,-
			•	○							ACP 35 T	10 366695 1535	10,-

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5		


Chip breaker MP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	•	-	ISO designation										
 <p>Medium machining</p>	WNNMG 060404-MP	•		○						HC 7620	10 311755 0312	8,95	
		•		○							HC 7620	10 311755 0412	8,95
	WNNMG 080404-MP	•		○							HC 7610	10 311755 0811	9,55
		•		○							HC 7620	10 311755 0812	9,55
	WNNMG 080408-MP	•		○							HC 7630	10 311755 0813	9,55
		•		○							HC 7610	10 311755 0911	9,55
	WNNMG 080412-MP	•		○							HC 7620	10 311755 0912	9,55
		•		○							HC 7630	10 311755 0913	9,55
			•		○						HC 7620	10 311755 1012	9,55

3147

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 160 - 350	Vc = 120 - 280	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	Vc = 170 - 290	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.4 ap = 0.6 - 5.0		

Chip breaker MP3-HP negative


F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	•	○	ISO designation									
 <p>Medium machining</p>	WNNMG 080408-MP3	•	○							ACP 25 T	10 311676 0114	10,50
		•	○								ACP 25 T	10 311676 0214
			•	○								

Highly wear-resistant

3147

ISO	ACP 25 T
ISO P steel	Vc = 100 - 270
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.45 ap = 1.0 - 4.0



Chip breaker PM negative

F finishing	M medium	R roughing	<b>pablit®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	•	-	ISO designation										
 <p>Medium machining</p>	WNNMG 060404-PM	•		•						PHG 115	10 333672 1064	8,10	
		•		•							PHG 125	10 333672 1065	8,10
	WNNMG 060408-PM	•		•							PHG 115	10 333672 1164	8,10
		•		•							PHG 125	10 333672 1165	8,10
	WNNMG 080404-PM	•		•							PHG 115	10 333672 0164	10,-
		•		•							PHG 125	10 333672 0165	10,-
	WNNMG 080408-PM	•		•							PHG 115	10 333672 0264	10,-
		•		•							PHG 125	10 333672 0265	10,-
	WNNMG 080412-PM	•		•							PHG 115	10 333672 0364	10,-
		•		•							PHG 125	10 333672 0365	10,-
	WNNMG 080416-PM	•		•							PHG 115	10 333672 0464	10,-
		•		•							PHG 125	10 333672 0465	10,-

3148


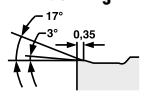
ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 270	Vc = 100 - 240
ISO K cast iron	Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.65 ap = 0.50 - 4.50	

Chip breaker RP2 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	☞	art.no.	€
-	○	●	ISO designation										
 <p><b>Roughing/medium machining</b></p> 	WNMG 080408-RP2	●	○	○						ACP 25 T	10	<b>366702</b> 0125	10,-
	WNMG 080412-RP2	●	○	○						ACP 25 T	10	366702 0225	10,-

3135

Chip breaker RP5 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	☞	art.no.	€	
-	○	●	ISO designation											
 <p><b>Roughing/medium machining</b></p> 	WNMG 080408-RP5	●		●						HC 7610	10	<b>311520</b> 1911	9,55	
		●		●							HC 7620	10	311520 1912	9,55
		●		●							HC 7630	10	311520 1913	9,55
	WNMG 080412-RP5	●		●						HC 7620	10	311520 2012	9,55	

3147

ISO	ACP 25 T
ISO P steel	Vc = 100 - 240
ISO M stainless steel	Vc = 70 - 210
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 6.0



ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 190 - 320	Vc = 160 - 270	Vc = 140 - 230
ISO K cast iron	Vc = 230 - 520	Vc = 190 - 440	Vc = 140 - 390
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.20 - 0.40	f = 0.20 - 0.60	f = 0.20 - 0.40
	ap = 0.80 - 6.0		

ISO indexable cutting inserts WN.. ISO M

• 80° trigometric, negative 0°




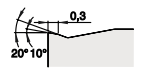
Chip breaker FM5 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	☞	art.no.	€
●	-	-	ISO designation										
 <p><b>Micro finishing</b></p> 	WNGP 080404-FM5		●	○	○	○	○	○	○	APM 20 T	10	<b>366692</b> 0120	15,30
	WNGP 080408-FM5		●	○	○	○	○	○	○	APM 20 T	10	366692 0220	15,30

3135

ISO	APM 20 T
ISO M stainless steel	Vc = 60 - 200
ISO K cast iron	Vc = 120 - 220
ISO N Al/non-ferrous	Vc = 100 - 600
ISO S superalloys	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.2 ap = 0.14 - 2.5

Chip breaker SF negative


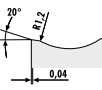
F finishing	M medium	R roughing	<b>palbit®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	☞	art.no.	€	
○	●	-	ISO designation											
 <p><b>Finishing/medium machining</b></p> 	WNMG 060404-SF		●							PHS 215	10	<b>333668</b> 0371	8,10	
			●								PHS 225	10	333668 0472	8,10
	WNMG 060408-SF		●								PHS 215	10	333668 0771	8,10
			●								PHS 225	10	333668 0872	8,10
	WNMG 060412-SF		●								PHS 215	10	333668 1171	8,10
			●								PHS 225	10	333668 1272	8,10
	WNMG 080404-SF		●								PHS 215	10	333668 1571	10,-
			●								PHS 225	10	333668 1672	10,-
	WNMG 080408-SF		●								PHS 215	10	333668 1971	10,-
			●								PHS 225	10	333668 2072	10,-
	WNMG 080412-SF		●								PHS 215	10	333668 2371	10,-
			●								PHS 225	10	333668 2472	10,-

3148

ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 80 - 290	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.55 ap = 0.6 - 3.0	

Continued on next page >>>


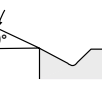
Chip breaker MM (HC75..) negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
 <p>Medium machining</p> 	WNMG 060404-MM	●						○		HC 7530	10 310757 0326	8,95
	WNMG 080408-MM	●						○		HC 7520	10 310757 0925	9,55
		●						○		HC 7530	10 310757 0926	9,55

3147

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 150 - 240	Vc = 130 - 200
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.40 ap = 0.5 - 5.0	


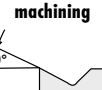
Chip breaker MM5 negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
 <p>Medium machining</p> 	WNMG 060404-MM5	○	●							APM 25 T	10 366694 0121	9,45
	WNMG 060408-MM5	○	●							APM 25 T	10 366694 0221	9,45
	WNMG 080404-MM5	○	●							APM 25 T	10 366694 0321	10,-
	WNMG 080408-MM5	○	●							APM 25 T	10 366694 0421	10,-
	WNMG 080412-MM5	○	●							APM 25 T	10 366694 0521	10,-

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5

Chip breaker SM2-HP negative

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
 <p>Roughing/medium machining</p> 	WNMG 080404-SM2	○	●							ACM 20 T	10 311679 0112	10,50
	WNMG 080408-SM2	○	●							ACM 20 T	10 311679 0212	10,50


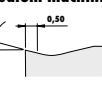
Highly wear-resistant

3147

ISO	ACM 20 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.4 ap = 1.0 - 4.2

Chip breaker GS negative

NEW

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Medium machining</p> 	WNMG 060404-GS		●					●		PHH 920	10 333583 0494	8,20
	WNMG 060408-GS		●					●		PHH 910	10 333583 0495	8,20
	WNMG 080404-GS		●					●		PHH 920	10 333583 0594	8,20
	WNMG 080408-GS		●					●		PHH 910	10 333583 0595	8,20
	WNMG 080404-GS		●					●		PHH 920	10 333583 0194	9,90
	WNMG 080408-GS		●					●		PHH 910	10 333583 0195	9,90
WNMG 080408-GS		●					●		PHH 920	10 333583 0294	9,90	
WNMG 080412-GS		●					●		PHH 910	10 333583 0295	9,90	
WNMG 080412-GS		●					●		PHH 920	10 333583 0394	9,90	
WNMG 080412-GS		●					●		PHH 910	10 333583 0395	9,90	

3148

ISO	PHH 910	PHH 920
ISO M stainless steel	Vc = 130 - 250	Vc = 110 - 220
ISO S superalloys	Vc = 25 - 70	Vc = 20 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.40 ap = 0.15 - 3.50	

NEW

Chip breaker SS negative

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	•	•	ISO designation		●					PHS 215	10 333674 0171	8,10
<b>Roughing/medium machining</b>												
WNMG 060404-SS												
WNMG 060408-SS												
WNMG 080404-SS												
WNMG 080408-SS												
WNMG 080412-SS												
WNMG 080412-SS												

3148

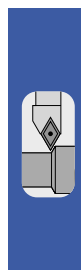
ISO	PHS 215	PHS 225
ISO M stainless steel	Vc = 55 - 240	Vc = 55 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.6 ap = 0.5 - 4.0	

Chip breaker RM5 negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	•	ISO designation		●					APM 25 T	10 366699 0121	10,-
<b>Roughing/medium machining</b>												
WNMG 080408-RM5												
WNMG 080412-RM5												

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.5 - 6.0



ISO indexable cutting inserts WN.. ISO K

• 80° trigometric, negative 0°

ISO K

Chip breaker MK negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	•	-	ISO designation			●				ACK 20 T	10 366701 0130	10,-
<b>Medium machining</b>												
WNMG 080408-MK												
WNMG 080412-MK												

3135

ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.5 ap = 0.25 - 5.0

Chip breaker RK negative

F finishing	M medium	R roughing	ATORN	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	•	ISO designation			●				ACK 20 T	10 366693 0130	10,-
<b>Roughing/medium machining</b>												
WNMA 080408-RK												

3135

ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.5 ap = 0.25 - 5.5

Continued on next page >>>



Chip breaker RK2 negative

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
<p>Roughing/medium machining</p>			WNMG080408-RK2	○		●				ACK 20 T	10 366697 0130	10,-

3135

ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.6 ap = 0.5 - 5.0

Chip breaker RK3-HP negative

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
<p>Roughing</p>			WNMG 080408-RK3	○		●				ACK 10 T	10 311680 0511	10,50
			WNMG 080412-RK3	○		●				ACK 10 T	10 311680 0611	10,50
<b>Highly wear-resistant</b>												

3147

ISO	ACK 10 T
ISO P steel	Vc = 170 - 400
ISO K cast iron	Vc = 170 - 450
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.3 - 0.5 ap = 2.0 - 4.8

ISO indexable cutting inserts WN.. ISO N

• 80° trigometric, negative 0°

**ISO N** **NEW**

Chip breaker MS negative

F finishing	M medium	R roughing	palbit	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
<p>Medium machining</p>			WNMG 080408-MS				●			PH 0910	10 333667 0320	8,70
			WNMG 080412-MS				●			PH 0910	10 333667 0520	8,70

3148

ISO	PH 0910
ISO N Al/non-ferrous	Vc = 35 - 630
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.20 - 0.55 ap = 0.70 - 4.0

ISO indexable cutting inserts WN.. ISO S

• 80° trigometric, negative 0°

**ISO S**

Chip breaker MS1 negative

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
<p>Medium machining</p>			WNMG 080408-MS1		○			●		APS 10 T	10 366698 0132	10,-
				○				●		APS 15 T	10 366698 0231	10,-

3135


ISO	APS 10 T	APS 15 T
ISO M stainless steel	Vc = 60 - 230	Vc = 60 - 220
ISO S superalloys	Vc = 30 - 120	Vc = 30 - 120
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.3 ap = 0.25 - 3.0	

## ISO indexable cutting inserts CC.. ISO P

• 80° rhombic, positive 7°

**ISO P**


### Chip breaker FFP, CERMET design

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Micro finishing</p>	CCMT 060204-FFP			●	○	○				ATU 10 T	10 <b>366603</b> 0140	<b>6,90</b>
	CCMT 09T304-FFP			●	○	○					ATU 10 T	10 366603 0240

3135

ISO	ATU 10 T
<b>ISO P</b> steel	Vc = 160 - 270
<b>ISO M</b> stainless steel	Vc = 130 - 240
<b>ISO K</b> cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.65

### Chip breaker FS positive


F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Micro finishing</p>	CCGT 060201-FS			●	○			●		PH 7910	10 <b>333513</b> 0149	<b>10,-</b>
	CCGT 060202-FS			●	○			●		PH 7910	10 333513 0150	<b>10,-</b>
	CCGT 060204-FS			●	○			●		PH 7910	10 333513 0249	<b>10,-</b>
	CCGT 060204-FS			●	○			●		PH 7920	10 333513 0250	<b>10,-</b>
	CCGT 060204-FS			●	○			●		PH 7910	10 333513 0349	<b>10,-</b>
	CCGT 060204-FS			●	○			●		PH 7920	10 333513 0350	<b>10,-</b>
	CCGT 09T301-FS			●	○			●		PH 7910	10 333513 0449	<b>10,85</b>
	CCGT 09T301-FS			●	○			●		PH 7920	10 333513 0450	<b>10,85</b>
	CCGT 09T302-FS			●	○			●		PH 7910	10 333513 0549	<b>10,85</b>
	CCGT 09T302-FS			●	○			●		PH 7920	10 333513 0550	<b>10,85</b>
	CCGT 09T304-FS			●	○			●		PH 7910	10 333513 0649	<b>10,85</b>
	CCGT 09T304-FS			●	○			●		PH 7920	10 333513 0650	<b>10,85</b>

3148

ISO	PH 7910	PH 7920
<b>ISO P</b> steel	Vc = 115 - 245	Vc = 100 - 230
<b>ISO M</b> stainless steel	Vc = 100 - 230	Vc = 100 - 235
<b>ISO S</b> superalloys	Vc = 33 - 160	Vc = 25 - 145
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.01 - 0.25 ap = 0.10 - 3.00	

### Chip breaker BO positive

NEW


F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Micro finishing</p>	CCMT 060202-BO			●	○			○		PH 7910	10 <b>373510</b> 1049	<b>7,60</b>
	CCMT 060202-BO			●	○			○		PH 7920	10 373510 1050	<b>7,60</b>
	CCMT 060204-BO			●	○			○		PH 7910	10 373510 1149	<b>7,60</b>
	CCMT 060204-BO			●	○			○		PH 7920	10 373510 1150	<b>7,60</b>
	CCMT 060208-BO			●	○			○		PH 7920	10 373510 1250	<b>7,60</b>
	CCMT 09T302-BO			●	○			○		PH 7920	10 373510 1350	<b>8,10</b>
	CCMT 09T304-BO			●	○			○		PH 7910	10 373510 1349	<b>8,10</b>
	CCMT 09T304-BO			●	○			○		PH 7920	10 373510 1450	<b>8,10</b>
	CCMT 09T308-BO			●	○			○		PH 7910	10 373510 1449	<b>8,10</b>
	CCMT 09T308-BO			●	○			○		PH 7920	10 373510 1550	<b>8,10</b>
	CCMT 120404-BO			●	○			○		PH 7910	10 373510 1549	<b>9,50</b>
	CCMT 120404-BO			●	○			○		PH 7920	10 373510 1650	<b>9,50</b>
CCMT 120408-BO			●	○			○		PH 7910	10 373510 1649	<b>9,50</b>	
CCMT 120408-BO			●	○			○		PH 7920	10 373510 1750	<b>9,50</b>	

1172

ISO	PH 7910	PH 7920
<b>ISO P</b> steel	Vc = 115 - 245	Vc = 100 - 230
<b>ISO M</b> stainless steel	Vc = 100 - 230	Vc = 100 - 235
<b>ISO S</b> superalloys	Vc = 33 - 170	Vc = 23 - 150
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.30 ap = 0.30 - 1.50	

Continued on next page >>>


Chip breaker FP positive

F finishing	M medium	R roughing	<b>palbit</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Micro finishing</p>			CCMT 060202-FP	●						PHG 125	10 333502 0165	7,85
			CCMT 060204-FP	●						PHG 115	10 333502 0164	7,85
			CCMT 09T302-FP	●						PHG 125	10 333502 0265	7,85
			CCMT 09T304-FP	●						PHG 115	10 333502 0464	7,85
			CCMT 09T304-FP	●						PHG 125	10 333502 0465	7,85
			CCMT 09T308-FP	●						PHG 115	10 333502 0564	7,85
			CCMT 09T308-FP	●						PHG 125	10 333502 0565	7,85
		CCMT 120404-FP	●						PHG 115	10 333502 0664	9,75	
		CCMT 120404-FP	●						PHG 125	10 333502 0665	9,75	

3148

ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.45 ap = 0.06 - 2.40	

Chip breaker FU1 positive


F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Finishing</p>			CCGT 060201-FU1	●	●			●		HC 7820	10 311530 1312	10,60
			CCGT 060202-FU1	●	●			●		HC 7810	10 311530 1411	10,60
			CCGT 060202-FU1	●	●			●		HC 7820	10 311530 1412	10,60
			CCGT 060204-FU1	●	●			●		HC 7810	10 311530 1511	10,60
			CCGT 060204-FU1	●	●			●		HC 7820	10 311530 1512	10,60
			CCGT 09T301-FU1	●	●			●		HC 7820	10 311530 1612	12,25
			CCGT 09T302-FU1	●	●			●		HC 7810	10 311530 1711	12,25
			CCGT 09T302-FU1	●	●			●		HC 7820	10 311530 1712	12,25
		CCGT 09T304-FU1	●	●			●		HC 7810	10 311530 1811	12,25	
		CCGT 09T304-FU1	●	●			●		HC 7820	10 311530 1812	12,25	
		CCGT 09T308-FU1	●	●			●		HC 7810	10 311530 1911	12,25	
		CCGT 09T308-FU1	●	●			●		HC 7820	10 311530 1912	12,25	

3147

ISO	HC 7810	HC 7820
ISO P steel	Vc = 80 - 160	Vc = 50 - 130
ISO M stainless steel	Vc = 130 - 220	Vc = 100 - 210
ISO S superalloys	Vc = 40 - 70	Vc = 40 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.30 ap = 0.20 - 3.0	f = 0.02 - 0.30 ap = 0.10 - 3.0

Excellent chip control

Chip breaker FP1 positive

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Finishing</p>			CCMT 060202-FP1	●	○	○				ACP 25 T	10 366604 0125	6,90
			CCMT 060204-FP1	●		○				ACP 15 T	10 366604 0215	6,90
			CCMT 060204-FP1	●	○	○				ACP 25 T	10 366604 0325	6,90
			CCMT 09T302-FP1	●	○	○				ACP 25 T	10 366604 0425	7,90
			CCMT 09T304-FP1	●		○				ACP 15 T	10 366604 0515	7,90
			CCMT 09T304-FP1	●	○	○				ACP 25 T	10 366604 0625	7,90
			CCMT 09T308-FP1	●		○				ACP 15 T	10 366604 0715	7,90
		CCMT 09T308-FP1	●	○	○				ACP 25 T	10 366604 0825	7,90	
		CCMT 120404-FP1	●	○					ACP 35 T	10 366604 0915	7,90	
		CCMT 120404-FP1	●		○				ACP 15 T	10 366604 1015	9,80	

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 100 - 400	Vc = 100 - 240	Vc = 90 - 190
ISO M stainless steel		Vc = 70 - 200	Vc = 55 - 180
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.1 - 2.5		

Chip breaker FP positive

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	-	-	ISO designation										
<p>Finishing</p> <p>20°</p>	CCMT 060202-FP	●		○						HC 7610	10 311101 0111	6,60	
		●		○							HC 7620	10 311101 0112	6,60
	CCMT 060204-FP		●						●		HC 7520	10 311526 0125	6,60
		●		○							HC 7610	10 311101 0211	6,60
	CCMT 09T302-FP	●		○							HC 7620	10 311101 0212	6,60
			●						●		HC 7520	10 311526 0225	6,60
	CCMT 09T304-FP	●		○							HC 7610	10 311101 1111	7,50
		●		○							HC 7620	10 311101 1112	7,50
	CCMT 09T304-FP	●		○							HC 7610	10 311101 1211	7,50
			●						●		HC 7520	10 311526 0325	7,50
	CCMT 09T308-FP	●		○							HC 7610	10 311101 1311	7,50
		●		○							HC 7620	10 311101 1312	7,50
	CCMT 120404-FP		●						●		HC 7520	10 311526 0425	7,50
		●		○							HC 7610	10 311101 2611	9,40
	CCMT 120408-FP	●		○							HC 7620	10 311101 2612	9,40
		●		○							HC 7610	10 311101 2711	9,40
		●								HC 7620	10 311101 2712	9,40	

3147

ISO	HC 7520	HC 7610	HC 7620
ISO P steel		Vc = 200 - 380	Vc = 140 - 320
ISO M stainless steel	Vc = 150 - 220		
ISO K cast iron		Vc = 180 - 280	Vc = 160 - 260
ISO S superalloys	Vc = 30 - 60		
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.16 ap = 0.1 - 1.5		

Chip breaker FP2 positive

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	-	-	ISO designation										
<p>Finishing</p> <p>12°</p>	CCMX 09T304-FP2	●	○	○						ACP 25 T	10 366708 0125	11,85	
		○	●								APM 35 T	10 366708 0135	11,85
	CCMX 09T308-FP2	●	○	○							ACP 25 T	10 366708 0225	11,85
		○	●								APM 35 T	10 366708 0235	11,85

3135

ISO	ACP 25 T	APM 35 T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 130 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.4 ap = 0.3 - 3.0	

Chip breaker MP positive


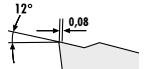
F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	●	-	ISO designation										
<p>Medium machining</p> <p>24° 8°</p>	CCMT 060204-MP	●		●						PHG 115	10 333501 0064	7,85	
		●									PH 7920	10 333508 0150	6,80
		●		●							PHG 125	10 333508 0165	7,85
	CCMT 060208-MP	●		●							PHG 115	10 333501 0164	7,85
		●		●							PHG 125	10 333501 0165	7,85
	CCMT 09T304-MP	●		●							PHG 115	10 333501 0264	7,85
		●		●							PHG 125	10 333501 0265	7,85
	CCMT 09T308-MP	●		●							PH 7920	10 333508 0350	6,80
		●		●							PHG 115	10 333501 0364	7,85
	CCMT 120404-MP	●		●							PHG 125	10 333501 0365	7,85
		●		●							PH 7920	10 333508 0450	6,80
	CCMT 120408-MP	●		●							PHG 115	10 333501 0464	9,75
		●		●							PHG 125	10 333501 0465	9,75
	CCMT 120412-MP	●		●							PHG 115	10 333501 0564	9,75
		●		●							PHG 125	10 333501 0565	9,75
			●								PH 7920	10 333508 0650	8,40
		●								PHG 115	10 333501 0664	9,75	

3148

ISO	PH 7920	PHG 115	PHG 125
ISO P steel	Vc = 100 - 230	Vc = 110 - 270	Vc = 100 - 240
ISO K cast iron		Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.06 - 0.60 ap = 0.19 - 3.60	f = 0.08 - 0.60 ap = 0.20 - 3.60	

Continued on next page >>>


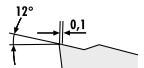
Chip breaker MP5 positive

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	•	○	ISO designation										
 <p>Medium machining</p> 			CCMT 060204-MP5	●		○				ACP 15 T	10 366606 0115	6,90	
				●	○						ACP 25 T	10 366606 0225	6,90
				●	○						ACP 35 T	10 366606 0335	6,90
			CCMT 060208-MP5	●	○						ACP 15 T	10 366606 0415	6,90
				●	○						ACP 25 T	10 366606 0525	6,90
			CCMT 09T304-MP5	●		○					ACP 15 T	10 366606 0615	7,90
				●	○						ACP 25 T	10 366606 0725	7,90
				●		○					ACP 35 T	10 366606 0835	7,90
			CCMT 09T308-MP5	●		○					ACP 15 T	10 366606 0915	7,90
				●	○						ACP 25 T	10 366606 1025	7,90
				●		○					ACP 35 T	10 366606 1135	7,90
			CCMT 120404-MP5	●	○						ACP 25 T	10 366606 1225	9,80
CCMT 120408-MP5	●	○						ACP 25 T	10 366606 1325	9,80			
CCMT 120412-MP5	●	○						ACP 25 T	10 366606 1425	9,80			

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5		

Chip breaker MP positive

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	•	-	ISO designation										
 <p>Medium machining</p> 			CCMT 060204-MP	●		○				HC 7610	10 311103 0211	6,60	
				●		○					HC 7620	10 311103 0212	6,60
				●							HC 7630	10 311103 0213	6,60
			CCMT 09T304-MP	●		○					HC 7610	10 311103 1211	7,50
				●		○					HC 7620	10 311103 1212	7,50
				●							HC 7630	10 311103 1213	7,50
			CCMT 09T308-MP	●		○					HC 7610	10 311103 1311	7,50
				●		○					HC 7620	10 311103 1312	7,50
				●							HC 7630	10 311103 1313	7,50
			CCMT 120404-MP	●		○					HC 7610	10 311103 2611	9,40
				●		○					HC 7620	10 311103 2612	9,40
				●							HC 7630	10 311103 2613	9,40
CCMT 120408-MP	●		○					HC 7610	10 311103 2711	9,40			
	●		○					HC 7620	10 311103 2712	9,40			
	●							HC 7630	10 311103 2713	9,40			

3147



ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 160 - 340	Vc = 110 - 250	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.16 - 0.35 ap = 0.6 - 4.0		

ISO indexable cutting inserts CC.. ISO M

- 80° rhombic, positive 7°

ISO M

Chip breaker FFM positive

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
•	-	-	ISO designation										
 <p>Micro finishing</p> 			CCGT 060200-FFM		●	○	○	○		APM 20 T	10 366602 0120	11,95	
			CCGT 060201-FFM		●	○	○	○			APM 20 T	10 366602 0220	11,95
			CCGT 09T300-FFM		●	○	○	○			APM 20 T	10 366602 0320	12,35
			CCGT 09T301-FFM		●	○	○	○			APM 20 T	10 366602 0420	12,35

3135

ISO	APM 20 T
ISO M stainless steel	Vc = 60 - 200
ISO K cast iron	Vc = 120 - 220
ISO N Al/non-ferrous	Vc = 100 - 600
ISO S superalloys	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.02 - 0.14 ap = 0.05 - 1.35

Chip breaker FM positive

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	-	-	<b>ISO designation</b>										
<p>Micro finishing</p>	CCMT 060202-FM				●			●		PH 7920	10 333504 0150	6,80	
	CCMT 060204-FM				●				●		PH 7910	10 333504 0249	6,80
	CCMT 09T302-FM				●						PHS 225	10 333504 0272	7,85
	CCMT 09T304-FM				●				●		PH 7920	10 333504 0350	6,80
	CCMT 09T304-FM				●				●		PH 7910	10 333504 0449	6,80
	CCMT 09T304-FM				●				●		PH 7920	10 333504 0450	6,80
	CCMT 09T308-FM				●				●		PH 7910	10 333504 0549	6,80
	CCMT 09T308-FM				●						PHS 225	10 333504 0572	7,85
CCMT 120404-FM				●				●		PH 7920	10 333504 0650	8,40	
CCMT 120404-FM				●						PHS 225	10 333504 0672	9,75	

3148

ISO	PH 7910	PH 7920	PHS 225
ISO M stainless steel	Vc = 100 - 230	Vc = 100 - 235	Vc = 90 - 240
ISO S superalloys	Vc = 35 - 170	Vc = 25 - 150	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.45 ap = 0.06 - 2.40		

Chip breaker FM1 positive

F finishing	M medium	R roughing	<b>ATORN</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	○	-	<b>ISO designation</b>										
<p>Finishing</p>	CCMT 060202-FM1			○	●					APM 25 T	10 366605 0121	6,90	
	CCMT 060204-FM1			○	●						APM 25 T	10 366605 0221	6,90
	CCMT 09T302-FM1			○	●						APM 25 T	10 366605 0321	7,90
	CCMT 09T304-FM1			○	●						APM 25 T	10 366605 0421	7,90
	CCMT 09T308-FM1			○	●						APM 25 T	10 366605 0521	7,90

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 60 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.2 - 2.5

Chip breaker MM positive



F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	●	-	<b>ISO designation</b>										
<p>Medium machining</p>	CCMT 060204-MM				●			●		PH 7910	10 333509 0149	6,80	
	CCMT 060204-MM				●				●		PH 7920	10 333509 0150	6,80
	CCMT 060208-MM				●				●		PHS 215	10 333509 0171	7,85
	CCMT 09T304-MM				●				●		PH 7920	10 333509 0250	6,80
	CCMT 09T304-MM				●						PH 7910	10 333509 0349	6,80
	CCMT 09T304-MM				●						PHS 215	10 333509 0350	6,80
	CCMT 09T304-MM				●						PHS 215	10 333509 0371	7,85
	CCMT 09T308-MM				●				●		PH 7910	10 333509 0449	6,80
	CCMT 09T308-MM				●				●		PH 7920	10 333509 0450	6,80
	CCMT 120404-MM				●						PHS 215	10 333509 0471	7,85
	CCMT 120404-MM				●				●		PH 7920	10 333509 0550	8,40
	CCMT 120408-MM				●						PHS 215	10 333509 0571	9,75
CCMT 120412-MM				●				●		PH 7910	10 333509 0649	8,40	
CCMT 120412-MM				●				●		PH 7920	10 333509 0650	8,40	
CCMT 120412-MM				●						PHS 215	10 333509 0671	9,75	
CCMT 120412-MM				●						PHS 215	10 333509 0771	9,75	

3148

ISO	PH 7910	PH 7920	PHS 215
ISO M stainless steel	Vc = 100 - 230	Vc = 100 - 235	Vc = 80 - 290
ISO S superalloys	Vc = 35 - 170	Vc = 25 - 150	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.06 - 0.60 ap = 0.19 - 3.60		f = 0.06 - 6.00 ap = 0.20 - 3.60


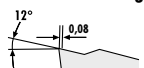
Continued on next page >>>

Chip breaker MP stainless steel positive

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 Medium machining 	CCMT 060204-MP		●					○		HC 7520	10 310103 0225	6,60
			●					○		HC 7530	10 310103 0226	6,60
	CCMT 09T304-MP		●					○		HC 7520	10 310103 1225	7,50
			●					○		HC 7530	10 310103 1226	7,50
	CCMT 09T308-MP		●					○		HC 7520	10 310103 1325	7,50
			●					○		HC 7530	10 310103 1326	7,50

3147

Chip breaker MM3 positive

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
 Medium machining 	CCMT 060204-MM3	○	●							APM 25 T	10 366607 0121	6,90	
	CCMT 060208-MM3	○	●							APM 25 T	10 366607 0221	6,90	
	CCMT 09T304-MM3	○	●								APM 25 T	10 366607 0321	7,90
		○	●								APM 35 T	10 366607 0422	7,90
	CCMT 09T308-MM3	○	●								APM 25 T	10 366607 0521	7,90
		○	●								APM 35 T	10 366607 0622	7,90
	CCMT 120404-MM3	○	●								APM 25 T	10 366607 0721	9,80
	CCMT 120408-MM3	○	●								APM 25 T	10 366607 0821	9,80
CCMT 120412-MM3	○	●								APM 25 T	10 366607 0921	9,80	

3135


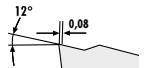
ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 80 - 210	Vc = 90 - 160
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.16 - 0.35 ap = 0.6 - 4.0	

ISO	APM 25 T	APM 35 T
ISO P steel	Vc = 80 - 250	Vc = 90 - 200
ISO M stainless steel	Vc = 40 - 250	Vc = 55 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.3 ap = 0.25 - 3.5	

ISO indexable cutting inserts CC.. ISO K

• 80° rhombic, positive 7°

Chip breaker MK positive

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 Universal application 	CCMT 060204-MK	○		●						ACK 20 T	10 366608 0130	6,90
	CCMT 09T304-MK	○		●						ACK 20 T	10 366608 0230	7,90
	CCMT 09T308-MK	○		●						ACK 20 T	10 366608 0330	7,90
	CCMT 120408-MK	○		●						ACK 20 T	10 366608 0430	9,80

3135


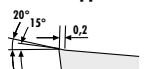
ISO K

ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.4 ap = 0.5 - 3.0

ISO indexable cutting inserts CC.. ISO N

• 80° rhombic, positive 7°

Chip breaker MN5 positive

F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
 Universal application 	CCGT 060201-MN5			○	●		○			AWN 15 T	10 366601 0116	10,70	
	CCGT 060202-MN5			○	●		○			AWN 15 T	10 366601 0216	10,70	
	CCGT 060204-MN5			○	●		○				AWN 15 T	10 366601 0316	10,70
				○	●		○				APN 15 T	10 366601 0517	11,95
	CCGT 09T302-MN5			○	●		○				AWN 15 T	10 366601 0616	11,20
				○	●		○				APN 15 T	10 366601 0717	12,35
	CCGT 09T304-MN5			○	●		○				AWN 15 T	10 366601 0816	11,20
				○	●		○				APN 15 T	10 366601 0917	12,35
	CCGT 09T308-MN5			○	●		○				AWN 15 T	10 366601 1016	11,20
				○	●		○				APN 15 T	10 366601 1117	12,35
	CCGT 120404-MN5			○	●		○				AWN 15 T	10 366601 1216	12,80
				○	●		○				APN 15 T	10 366601 1317	14,10
CCGT 120408-MN5			○	●		○				AWN 15 T	10 366601 1416	12,80	
			○	●		○				APN 15 T	10 366601 1517	14,10	



3135

ISO N

ISO	APN 15 T	AWN 15 T
ISO M stainless steel	Vc = 50 - 140	
ISO K cast iron	Vc = 120 - 200	Vc = 120 - 200
ISO N Al/non-ferrous	Vc = 100 - 3000	Vc = 100 - 2000
ISO S superalloys	Vc = 18 - 120	Vc = 18 - 45
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.5 ap = 0.1 - 4.5	



Chip breaker MN positive

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	●	-	ISO designation									
 <p>Finishing/medium machining</p> 	CCGT 060202-MN		○		●					HC 6310	10 310901 0141	11,40
	CCGT 060204-MN		○		●					HC 6310	10 310901 0241	11,40
	CCGT 09T302-MN		○		●					HC 6310	10 310901 1141	11,70
	CCGT 09T304-MN		○		●					HC 6310	10 310901 1241	11,70
	CCGT 09T308-MN		○		●					HC 6310	10 310901 1341	11,70
	CCGT 120402-MN		○		●					HC 6310	10 310901 2541	13,50
	CCGT 120404-MN		○		●					HC 6310	10 310901 2641	13,50
	CCGT 120408-MN		○		●					HC 6310	10 310901 2741	13,50

3147


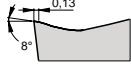
ISO	HC 6310
ISO M stainless steel	Vc = 120 - 200
ISO N Al/non-ferrous	Vc = 160 - 1000
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.16 ap = 0.3 - 2.0

ISO indexable cutting inserts DC.. ISO P

• 55° rhombic, positive 7°





Chip breaker FS

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Micro finishing</p> 	DCGT 070201-FS		●	●				●		PH 7910	10 333524 0149	10,-
	DCGT 070202-FS		●	●				●		PH 7920	10 333524 0150	10,-
	DCGT 070204-FS		●	●				●		PH 7910	10 333524 0249	10,-
	DCGT 070204-FS		●	●				●		PH 7920	10 333524 0250	10,-
	DCGT 070204-FS		●	●				●		PH 7910	10 333524 0349	10,-
	DCGT 070204-FS		●	●				●		PH 7920	10 333524 0350	10,-
	DCGT 11T301-FS		●	●				●		PH 7910	10 333524 0449	10,85
	DCGT 11T301-FS		●	●				●		PH 7920	10 333524 0450	10,85
DCGT 11T302-FS		●	●				●		PH 7910	10 333524 0549	10,85	
DCGT 11T302-FS		●	●				●		PH 7920	10 333524 0550	10,85	
DCGT 11T304-FS		●	●				●		PH 7910	10 333524 0649	10,85	
DCGT 11T304-FS		●	●				●		PH 7920	10 333524 0650	10,85	

3148

ISO	PH 7910	PH 7920
ISO P steel	Vc = 115 - 245	Vc = 100 - 230
ISO M stainless steel	Vc = 100 - 230	Vc = 100 - 235
ISO S superalloys	Vc = 35 - 170	Vc = 25 - 150
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.01 - 0.25 ap = 0.10 - 3.00	



Chip breaker FFP, CERMET design

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Micro finishing</p> 	DCMT 070204-FFP		●	○	○					ATU 10 T	10 366627 0140	7,90
	DCMT 11T304-FFP		●	○	○					ATU 10 T	10 366627 0240	9,15

3135

ISO	ATU 10 T
ISO P steel	Vc = 160 - 270
ISO M stainless steel	Vc = 130 - 240
ISO K cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.65

Chip breaker FP



F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Micro finishing</p> 	DCMT 070202-FP		●							PHG 125	10 333515 0165	7,85
	DCMT 070204-FP		●							PHG 115	10 333515 0264	7,85
	DCMT 070204-FP		●							PHG 125	10 333515 0265	7,85
	DCMT 11T302-FP		●							PH 7920	10 333515 0350	6,80
	DCMT 11T304-FP		●							PHG 115	10 333515 0464	7,85
	DCMT 11T304-FP		●							PHG 125	10 333515 0465	7,85
	DCMT 11T308-FP		●							PHG 115	10 333515 0564	7,85
DCMT 11T308-FP		●							PHG 125	10 333515 0565	7,85	

3148

ISO	PH 7920	PHG 115	PHG 125
ISO P steel	Vc = 100 - 230	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.45 ap = 0.06 - 2.40	f = 0.03 - 0.30 ap = 0.06 - 2.00	

Continued on next page >>>

Chip breaker FU1

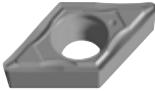

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	-	-	<b>ISO designation</b>										
 <p>Finishing</p> 	DCGT 070101-FU1	●	●					●		HC 7820	10 311530 2012	10,20	
	DCGT 070202-FU1	●	●					●		HC 7810	10 311530 2111	10,20	
	DCGT 070204-FU1	●	●						●		HC 7820	10 311530 2112	10,20
		●	●						●		HC 7810	10 311530 2211	10,20
	DCGT 11T301-FU1	●	●					●		HC 7820	10 311530 2312	12,10	
	DCGT 11T302-FU1	●	●						●		HC 7810	10 311530 2411	12,10
		●	●						●		HC 7820	10 311530 2412	12,10
	DCGT 11T304-FU1	●	●						●		HC 7810	10 311530 2511	12,10
DCGT 11T308-FU1	●	●						●		HC 7820	10 311530 2512	12,10	
	●	●						●		HC 7810	10 311530 2611	12,10	
●	●							●		HC 7820	10 311530 2612	12,10	

3147

ISO	HC 7810	HC 7820
ISO P steel	Vc = 80 - 160	Vc = 80 - 130
ISO M stainless steel	Vc = 130 - 220	Vc = 100 - 210
ISO S superalloys	Vc = 40 - 70	Vc = 40 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.30 ap = 0.20 - 3.0	f = 0.02 - 0.30 ap = 0.10 - 3.0

Excellent chip control


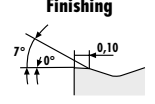
Chip breaker type FP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	-	-	<b>ISO designation</b>										
 <p>Finishing</p> 	DCMCT 070202-FP	●		○						HC 7610	10 311201 0511	7,50	
		●		○							HC 7620	10 311201 0512	7,50
		●	●						●		HC 7520	10 311527 0125	7,50
	DCMCT 070204-FP	●		○							HC 7610	10 311201 0611	7,50
		●		○							HC 7620	10 311201 0612	7,50
	DCMCT 11T302-FP	●		○							HC 7610	10 311201 1911	8,70
		●		○							HC 7620	10 311201 1912	8,70
	DCMCT 11T304-FP	●	●						●		HC 7520	10 311527 0325	8,70
		●		○							HC 7610	10 311201 2011	8,70
	DCMCT 11T308-FP	●		○							HC 7620	10 311201 2012	8,70
		●	●						●		HC 7520	10 311527 0425	8,70
	●		○								HC 7620	10 311201 2112	8,70
●	●							●		HC 7520	10 311527 0525	8,70	

3147

ISO	HC 7520	HC 7610	HC 7620
ISO P steel		Vc = 200 - 380	Vc = 140 - 320
ISO M stainless steel	Vc = 140 - 220		
ISO K cast iron		Vc = 180 - 280	Vc = 160 - 260
ISO S superalloys	Vc = 30 - 60		
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.16 ap = 0.1 - 1.5		


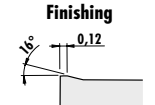
Chip breaker FP1

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	○	-	<b>ISO designation</b>										
 <p>Finishing</p> 	DCMCT 070202-FP1	●		○						ACP 15 T	10 366625 0015	7,90	
		●	●	○							ACP 25 T	10 366625 0125	7,90
	DCMCT 070204-FP1	●	●	○							ACP 25 T	10 366625 0225	7,90
		●		○							ACP 15 T	10 366625 0415	7,90
	DCMCT 11T302-FP1	●		○							ACP 15 T	10 366625 0715	9,15
		●	●	○							ACP 25 T	10 366625 0725	9,15
	DCMCT 11T304-FP1	●		○							ACP 15 T	10 366625 1015	9,15
		●	●	○							ACP 25 T	10 366625 1025	9,15
DCMCT 11T308-FP1	●	●	○							ACP 25 T	10 366625 1325	9,15	

3135

ISO	ACP 15 T	ACP 25 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240
ISO M stainless steel		Vc = 70 - 210
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.5 - 2.5	




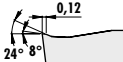
Chip breaker FP2, positive

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
●	-	-	<b>ISO designation</b>										
 <p>Finishing</p> 	DCMX 070204-FP2	●	○	○						ACP 25 T	10 366709 0125	8,65	
		○	●								APM 35 T	10 366709 0135	11,10
	DCMX 11T304-FP2	●	●	○							ACP 25 T	10 366709 0225	11,10
		●	●	○							ACP 25 T	10 366709 0325	11,10

3135

ISO	ACP 25 T	APM 35 T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.5 ap = 0.1 - 3.0	



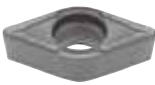
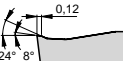
Chip breaker MP

F finishing ○	M medium ●	R roughing -	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
 Medium machining 	DCMT 070204-MP	●			●					PHG 115	10 333520 0164	7,85
		●			●					PHG 125	10 333520 0165	7,85
	DCMT 070208-MP	●			●					PHG 125	10 333520 0265	7,85
		●			●					PHG 115	10 333566 0164	7,85
	DCMT 11T304-MP	●			●					PHG 115	10 333566 0264	7,85
		●			●					PHG 125	10 333566 0265	7,85
	DCMT 11T308-MP	●			●					PHG 115	10 333566 0364	7,85
		●			●					PHG 125	10 333566 0365	7,85
	DCMT 11T312-MP	●			●					PHG 115	10 333566 0464	7,85
		●			●					PHG 125	10 333566 0465	7,85

3148

ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 270	Vc = 100 - 240
ISO K cast iron	Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.06 - 0.60 ap = 0.20 - 3.00	



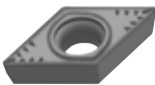
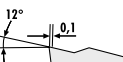
Chip breaker MP

F finishing ○	M medium ●	R roughing -	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
 Finishing 	DCMT 070204-MP	●								PH 7920	10 333520 0150	6,80
	DCMT 11T304-MP	●								PH 7920	10 333520 0350	6,80
	DCMT 11T308-MP	●								PH 7920	10 333520 0450	6,80

3148

ISO	PH 7920
ISO P steel	Vc = 100 - 230
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.06 - 0.60 ap = 0.19 - 3.60




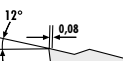
Chip breaker type MP

F finishing -	M medium ●	R roughing -	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
 Medium machining 	DCMT 070204-MP	●		○						HC 7610	10 311203 0611	7,50
		●		○						HC 7620	10 311203 0612	7,50
		●		○						HC 7630	10 311203 0613	7,50
	DCMT 070208-MP	●		○						HC 7610	10 311203 0711	7,50
		●		○						HC 7620	10 311203 0712	7,50
		●		○						HC 7630	10 311203 0713	7,50
	DCMT 11T304-MP	●		○						HC 7620	10 311203 2012	8,70
		●		○						HC 7630	10 311203 2013	8,70
	DCMT 11T308-MP	●		○						HC 7620	10 311203 2112	8,70
		●		○						HC 7630	10 311203 2113	8,70

3147

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 160 - 340	Vc = 110 - 250	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.16 - 0.30 ap = 0.6 - 4.0		

Chip breaker MP5

F finishing ○	M medium ●	R roughing -	 ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	 art.no.	€
 Medium machining 	DCMT 070204-MP5	●	○							ACP 25 T	10 366630 0125	7,90
		●	○							ACP 35 T	10 366630 0235	7,90
	DCMT 070208-MP5	●	○							ACP 25 T	10 366630 0325	7,90
		●	○							ACP 35 T	10 366630 0435	7,90
	DCMT 11T304-MP5	●	○							ACP 15 T	10 366630 0515	9,15
		●	○							ACP 25 T	10 366630 0625	9,15
		●	○							ACP 35 T	10 366630 0735	9,15
	DCMT 11T308-MP5	●	○							ACP 15 T	10 366630 0815	9,15
		●	○							ACP 25 T	10 366630 0925	9,15
		●	○							ACP 35 T	10 366630 1035	9,15

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5		

## ISO indexable cutting inserts DC.. ISO M

**ISO M**

• 55° rhombic, positive 7°

### Chip breaker FFM

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ISO designation												
<p>Micro finishing</p>			DCGT 070200-FFM		●	○	○	○		APM 20 T	10 366624 0120	16,20
			DCGT 070201-FFM		●	○	○	○		APM 20 T	10 366624 0220	16,20
			DCGT 11T300-FFM		●	○	○	○		APM 20 T	10 366624 0320	16,20
			DCGT 11T301-FFM		●	○	○	○		APM 20 T	10 366624 0420	16,20

3135

ISO	APM 20 T
<b>ISO M</b> stainless steel	Vc = 60 - 200
<b>ISO K</b> cast iron	Vc = 120 - 220
<b>ISO N</b> Al/non-ferrous	Vc = 100 - 600
<b>ISO S</b> superalloys	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.02 - 0.14 ap = 0.05 - 1.35

### Chip breaker FM

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ISO designation												
<p>Micro finishing</p>			DCMT 070202-FM		●			●		PH 7920	10 333516 0150	6,80
			DCMT 070204-FM		●			●		PH 7920	10 333516 0250	6,80
			DCMT 11T302-FM		●			●		PH 7910	10 333516 0549	6,80
			DCMT 11T304-FM		●			●		PH 7920	10 333516 0550	6,80
			DCMT 11T304-FM		●			●		PH 7910	10 333516 0349	6,80
			DCMT 11T304-FM		●			●		PH 7920	10 333516 0350	6,80
			DCMT 11T308-FM		●			●		PH 7910	10 333516 0449	6,80
			DCMT 11T308-FM		●			●		PH 7920	10 333516 0450	6,80
				●					PHS 225	10 333516 0472	7,85	

3148

ISO	PH 7910	PH 7920	PHS 225
<b>ISO M</b> stainless steel	Vc = 100 - 235	Vc = 100 - 235	Vc = 90 - 240
<b>ISO S</b> superalloys	Vc = 35 - 170	Vc = 25 - 150	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.45 ap = 0.06 - 2.40		ap = 0.06 - 2.4

### Chip breaker FM1

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ISO designation												
<p>Finishing/medium machining</p>			DCMT 070202-FM1	○	●					APM 25 T	10 366626 0125	7,90
			DCMT 070204-FM1	○	●					APM 25 T	10 366626 0225	7,90
			DCMT 11T302-FM1	○	●					APM 25 T	10 366626 0325	9,15
			DCMT 11T304-FM1	○	●					APM 25 T	10 366626 0425	9,15
			DCMT 11T308-FM1	○	●					APM 25 T	10 366626 0525	9,15

3135

ISO	APM 25 T
<b>ISO P</b> steel	Vc = 60 - 250
<b>ISO M</b> stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.2 - 2.5


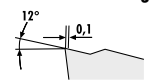
### Chip breaker MM

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
ISO designation													
<p>Medium machining</p>			DCMT 070204-MM		●			●		PH 7910	10 333521 0149	6,80	
			DCMT 070204-MM		●			●		PH 7920	10 333521 0150	6,80	
			DCMT 070204-MM		●				●		PHS 215	10 333521 0171	7,85
			DCMT 070208-MM		●				●		PH 7920	10 333521 0250	6,80
			DCMT 070208-MM		●						PHS 215	10 333521 0271	7,85
			DCMT 11T304-MM		●				●		PH 7910	10 333521 0349	6,80
			DCMT 11T304-MM		●				●		PH 7920	10 333521 0350	6,80
			DCMT 11T304-MM		●						PHS 215	10 333521 0371	7,85
			DCMT 11T308-MM		●				●		PH 7910	10 333521 0449	6,80
			DCMT 11T308-MM		●				●		PH 7920	10 333521 0450	6,80
			DCMT 11T308-MM		●						PHS 215	10 333521 0471	7,85
			DCMT 11T312-MM		●				●		PH 7920	10 333521 0550	6,80
		DCMT 11T312-MM		●						PHS 215	10 333521 0571	7,85	

3148


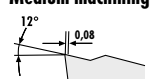
ISO	PH 7910	PH 7920	PHS 215
<b>ISO M</b> stainless steel	Vc = 100 - 230	Vc = 100 - 235	Vc = 80 - 290
<b>ISO S</b> superalloys	Vc = 35 - 170	Vc = 25 - 150	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.06 - 0.60 ap = 0.19 - 3.60		ap = 0.19 - 3.00

Chip breaker type MP, stainless steel

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
 <p>Medium machining</p> 	DCMT 070204-MP	●						○		HC 7530	10 310203 0626	7,50
	DCMT 11T304-MP	●						○		HC 7530	10 310203 2026	8,70
	DCMT 11T308-MP	●						○		HC 7530	10 310203 2126	8,70


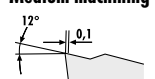
3147

Chip breaker MM3

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Medium machining</p> 	DCMT 070204-MM3	○	●							APM 25 T	10 366629 0121	7,90
	DCMT 070208-MM3	○	●							APM 25 T	10 366629 0221	7,90
	DCMT 11T304-MM3	○	●							APM 25 T	10 366629 0321	9,15
	DCMT 11T308-MM3	○	●							APM 25 T	10 366629 0521	9,15

3135

Chip breaker type MS

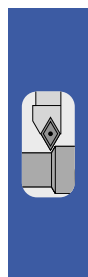
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
 <p>Medium machining</p> 	DCMT 070208-MS	○	●					○		HC 7220	10 311203 0714	7,50
	DCMT 11T308-MS	○	●					○		HC 7220	10 311203 2114	8,70

3147

ISO	HC 7530
ISO M stainless steel	Vc = 90 - 160
ISO S superalloys	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.16 - 0.30 ap = 0.6 - 4.0

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.3 ap = 0.25 - 3.5

ISO	HC 7220
ISO M stainless steel	Vc = 120 - 190
ISO S superalloys	Vc = 30 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.16 - 0.3 ap = 0.6 - 4.0


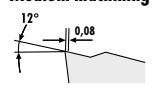


## ISO indexable cutting inserts DC.. ISO K

- 55° rhombic, positive 7°

ISO K

## Chip breaker MK

F finishing	M medium	R roughing	ATORN®						Quality	art.no.	€	
○	●	-	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H				
 <p>Medium machining</p> 			ISO designation									
			DCMT 070204-MK	○		●				ACK 20 T	10	366628 0130
			DCMT 11T304-MK	○		●			ACK 20 T	10	366628 0230	9,15

3135



ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.4 ap = 0.5 - 3.5

## ISO indexable cutting inserts DC.. ISO N

- 55° rhombic, positive 7°

ISO N



## Chip breaker MN5

F finishing	M medium	R roughing	ATORN®						Quality	art.no.	€	
○	○	○	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H				
 <p>Universal application</p> 			ISO designation									
			DCGT 070201-MN5			○	●	○	AWN 15 T	10	366623 0116	10,15
			DCGT 070202-MN5			○	●	○	AWN 15 T	10	366623 0216	10,15
			DCGT 070204-MN5			○	●	○	AWN 15 T	10	366623 0416	10,15
			DCGT 070208-MN5		○	●	○		APN 15 T	10	366623 0517	11,20
			DCGT 070208-MN5			○	●	○	AWN 15 T	10	366623 0616	10,15
			DCGT 11T302-MN5		○	●	○		AWN 15 T	10	366623 0716	11,20
			DCGT 11T304-MN5		○	●	○		APN 15 T	10	366623 0817	12,75
			DCGT 11T304-MN5			○	●	○	AWN 15 T	10	366623 0916	11,70
			DCGT 11T304-MN5		○	●	○		APN 15 T	10	366623 1017	12,75
			DCGT 11T308-MN5			○	●	○	AWN 15 T	10	366623 1116	11,70
			DCGT 11T308-MN5		○	●	○		APN 15 T	10	366623 1217	12,75

3135

ISO	APN 15 T	AWN 15 T
ISO M stainless steel	Vc = 50 - 140	
ISO K cast iron	Vc = 120 - 200	Vc = 120 - 200
ISO N Al/non-ferrous	Vc = 100 - 3000	Vc = 100 - 2000
ISO S superalloys	Vc = 18 - 120	Vc = 18 - 45
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.5 ap = 0.1 - 4.5	

## Chip breaker MN

F finishing	M medium	R roughing	ATORN®						Quality	art.no.	€	
●	●	-	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H				
 <p>Finishing/medium machining</p> 			ISO designation									
			DCGT 070202-MN		○		●		HC 6310	10	310903 0541	10,70
			DCGT 070204-MN		○		●		HC 6310	10	310903 0641	10,70
			DCGT 11T302-MN		○		●		HC 6310	10	310903 1941	12,20
			DCGT 11T304-MN		○		●		HC 6310	10	310903 2041	12,20
			DCGT 11T308-MN		○		●		HC 6310	10	310903 2141	12,20

3147

ISO	HC 6310
ISO M stainless steel	Vc = 120 - 200
ISO N Al/non-ferrous	Vc = 160 - 1000
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.16 ap = 0.3 - 3.5


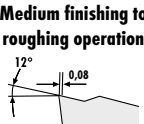
## ISO indexable cutting inserts RC.. ISO P

ISO P

- 360° round, positive 7°

### Chip breaker MP5


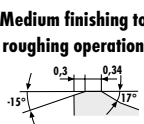
- For RCMT 08.. ap max. = 4.0 mm
- For RCMT 10.. ap max. = 5.0 mm

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	○	ISO designation									
			RCMT 0803MO-MP5	●	○					ACP35T	10 366646 0135	6,40
			RCMT 1003MO-MP5	●	○					ACP35T	10 366646 0235	7,45
			RCMT 1204MO-MP5	●	○					ACP 35 T	10 366646 0335	8,45

3135

### Chip breaker RP11

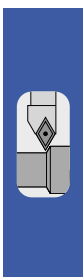
- With RCMT 2006MO.. ap up to 9.5 mm possible

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	○	●	ISO designation									
			RCMT 1606MO-RP11	●	○	○				ACP25T	10 366647 0125	14,10
			RCMT 2006MO-RP11	●	○	○				ACP25T	10 366647 0225	19,15
				●	○					ACP35T	10 366647 0335	14,10
				●	○					ACP35T	10 366647 0435	19,15

3135

ISO	ACP35T
ISO P steel	Vc = 90 - 200
ISO M stainless steel	Vc = 55 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.6 ap = 0.8 - 6.0

ISO	ACP25T	ACP35T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 130 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.7 ap = 2.0 - 7.0	


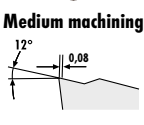


## ISO indexable cutting inserts SC.. ISO P

ISO P

- 90° square, positive 7°


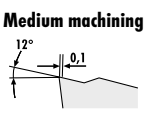
### Chip breaker MP5

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	ISO designation									
			SCMT 09T304-MP5	●	○	○				ACP 25 T	10 366649 0125	9,25
			SCMT 09T308-MP5	●	○	○				ACP 25 T	10 366649 0225	9,25
			SCMT 120404-MP5	●	○	○				ACP 35 T	10 366649 0335	9,25
			SCMT 120408-MP5	●	○	○				ACP 15 T	10 366649 0415	11,35
				●	○	○				ACP 25 T	10 366649 0525	11,35
				●	○	○				ACP 25 T	10 366649 0625	11,35
				●	○	○				ACP 35 T	10 366649 0735	11,35
				●	○	○				ACP 25 T	10 366649 0825	11,35
				●	○	○				ACP 35 T	10 366649 0935	11,35

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 190
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]		f = 0.12 - 0.4 ap = 0.25 - 4.5	

### Chip breaker type MP

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
			SCMT 09T304-MP	●		○				HC 7620	10 311401 1212	8,75
			SCMT 09T308-MP	●		○				HC 7630	10 311401 1213	8,75
			SCMT 120404-MP	●		○				HC 7620	10 311401 1312	8,75
			SCMT 120408-MP	●		○				HC 7630	10 311401 1313	8,75
				●		○				HC 7620	10 311401 2612	10,80
				●		○				HC 7620	10 311401 2712	10,80

3147

ISO	HC 7620	HC 7630
ISO P steel	Vc = 110 - 250	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]		f = 0.12 - 0.35 ap = 0.1 - 3.0

Continued on next page >>>



Chip breaker type MP

F finishing	M medium	R roughing	<b>palbit</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-		●		●				PHG 115	10 333567 0164	8,10
			SCMT 09T304-MP	●		●				PHG 125	10 333567 0165	8,10
			SCMT 09T308-MP	●		●				PHG 115	10 333567 0264	8,10
				●		●				PHG 125	10 333567 0265	8,10
			SCMT 120404-MP	●		●				PHG 115	10 333567 0364	9,75
				●		●				PHG 125	10 333567 0465	9,75
			SCMT 120408-MP	●		●				PHG 125	10 333567 0365	9,75
				●		●				PHG 115	10 333567 0464	9,75
			SCMT 120412-MP	●		●				PHG 115	10 333567 0564	9,75
				●		●				PHG 125	10 333567 0565	9,75

3148

ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 350	Vc = 100 - 295
ISO K cast iron	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.60 ap = 0.25 - 3.60	

ISO indexable cutting inserts SC.. ISO M

- 90° square, positive 7°

ISO M

Chip breaker MM3, especially for stainless steel

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	SCMT 09T304-MM3	○	●					APM 25 T	10 366650 0121	9,25
			SCMT 09T308-MM3	○	●					APM 25 T	10 366650 0221	9,25
			SCMT 120404-MM3	○	●					APM 25 T	10 366650 0321	11,35
			SCMT 120408-MM3	○	●					APM 25 T	10 366650 0421	11,35
			SCMT 120412-MM3	○	●					APM 25 T	10 366650 0521	11,35

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5

Chip breaker type MP, stainless steel

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	SCMT 09T308-MP		●			○		HC 7520	10 311401 1322	8,75
			SCMT 120408-MP		●			○		HC 7520	10 311401 2722	10,80

3147

ISO	HC 7520
ISO M stainless steel	Vc = 80 - 220
ISO S superalloys	Vc = 30 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.32 ap = 0.5 - 2.5

ISO indexable cutting inserts SC.. ISO K

- 90° square, positive 7°

ISO K

Chip breaker MK

F finishing	M medium	R roughing	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	SCMT 09T308-MK	○		●				ACK 20 T	10 366651 0130	9,25
			SCMT 120408-MK	○		●				ACK 20 T	10 366651 0230	11,35

3135

ISO	ACK 20 T
ISO P steel	Vc = 150 - 340
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.5 ap = 0.5 - 5.0

## ISO indexable cutting inserts SC.. ISO N

• 90° square, positive 7°

Chip breaker MN5

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	○	○	ISO designation			○	●	○		AWN 15 T	10 366648 0116	11,50
<p>Universal application</p>			SCGT 09T304-MN5		○	●	○			AWN 15 T	10 366648 0217	14,35
			SCGT 09T308-MN5		○	●	○			AWN 15 T	10 366648 0316	11,50
			SCGT 120408-MN5		○	●	○			AWN 15 T	10 366648 0417	14,35
			SCGT 120408-MN5		○	●	○			AWN 15 T	10 366648 0617	14,35

3135

ISO N

ISO	APN 15 T	AWN 15 T
<b>ISO M</b> stainless steel	Vc = 50 - 140	
<b>ISO K</b> cast iron	Vc = 120 - 200	Vc = 120 - 200
<b>ISO N</b> Al/non-ferrous	Vc = 100 - 2000	Vc = 100 - 2000
<b>ISO S</b> superalloys	Vc = 18 - 120	Vc = 18 - 48
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.5 ap = 0.25 - 6.0	

## ISO indexable cutting inserts TC.. ISO P

• 60° triangular, positive 7°

Chip breaker FFP Cermet version

F finishing	M medium	R roughing	ATORN®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation							ATU 10 T	10 366666 0140	12,95
<p>Micro finishing</p>			TCGT 110202-FFP	●	○	○				ATU 10 T	10 366666 0140	12,95
			TCMT 110204-FFP	●	○	○				ATU 10 T	10 366666 0240	7,45

3135

ISO P

ISO	ATU 10 T
<b>ISO P</b> steel	Vc = 160 - 300
<b>ISO M</b> stainless steel	Vc = 130 - 240
<b>ISO K</b> cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.65

Chip breaker FS


F finishing	M medium	R roughing	palbit®	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation							PH 7910	10 333554 0149	10,-
<p>Micro finishing</p>			TCGT 090202-FS	●	●			●		PH 7910	10 333554 0150	10,-
			TCGT 090204-FS	●	●			●		PH 7910	10 333554 0249	10,-
			TCGT 110201-FS	●	●			●		PH 7910	10 333554 0250	10,-
			TCGT 110201-FS	●	●			●		PH 7910	10 333554 0349	10,30
			TCGT 110201-FS	●	●			●		PH 7920	10 333554 0350	10,30
			TCGT 110202-FS	●	●			●		PH 7910	10 333554 0449	10,30
			TCGT 110202-FS	●	●			●		PH 7920	10 333554 0450	10,30
			TCGT 110204-FS	●	●			●		PH 7910	10 333554 0549	10,30
			TCGT 110204-FS	●	●			●		PH 7920	10 333554 0550	10,30
			TCGT 110301-FS	●	●			●		PH 7910	10 333554 0649	10,30
			TCGT 110301-FS	●	●			●		PH 7920	10 333554 0650	10,30
			TCGT 110302-FS	●	●			●		PH 7910	10 333554 0749	10,30
			TCGT 110302-FS	●	●			●		PH 7920	10 333554 0750	10,30
			TCGT 110304-FS	●	●			●		PH 7910	10 333554 0849	10,30
TCGT 110304-FS	●	●			●		PH 7920	10 333554 0850	10,30			

3148

ISO	PH 7910	PH 7920
<b>ISO P</b> steel	Vc = 115 - 245	Vc = 100 - 230
<b>ISO M</b> stainless steel	Vc = 100 - 230	Vc = 100 - 235
<b>ISO S</b> superalloys	Vc = 35 - 170	Vc = 25 - 150
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.01 - 0.25 ap = 0.10 - 3.00	

Continued on next page >>>


Chip breaker FP

F finishing ●	M medium -	R roughing -	palbit	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <p>Micro finishing</p>	TCMT 090202-FP	●									PH 5125	10 333546 0323	6,80
	TCMT 090204-FP	●									PH 5115	10 333546 0422	6,80
	TCMT 110202-FP	●									PHG 125	10 333546 0465	7,50
	TCMT 110204-FP	●									PHG 115	10 333546 0664	7,85
	TCMT 110208-FP	●									PH 5115	10 333546 0722	6,80
	TCMT 110302-FP	●									PH 5125	10 333546 0723	6,80
	TCMT 110304-FP	●									PHG 115	10 333546 0823	6,80
	TCMT 110308-FP	●									PHG 115	10 333546 0964	7,85
	TCMT 110308-FP	●									PH 5115	10 333546 1022	6,80
	TCMT 110308-FP	●									PH 5125	10 333546 1023	6,80
TCMT 16T304-FP	●									PHG 125	10 333546 1165	8,10	

3148

ISO	PH 5115	PH 5125	PHG 115	PHG 125
ISO P steel	Vc = 110 - 350	Vc = 100 - 295	Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.45 ap = 0.06 - 2.40			

Chip breaker MP

F finishing ○	M medium ●	R roughing -	palbit	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
 <p>Medium machining</p>	TCMT 090204-MP	●		●							PHG 115	10 333550 0164	7,50	
	TCMT 090208-MP	●		●							PHG 125	10 333550 0165	7,50	
	TCMT 090208-MP	●		●							PH 5115	10 333550 0222	6,80	
	TCMT 110204-MP	●		●							PHG 125	10 333550 0265	7,50	
	TCMT 110204-MP	●		●							PHG 115	10 333550 0364	7,85	
	TCMT 110208-MP	●		●							PHG 125	10 333550 0365	7,85	
	TCMT 110208-MP	●		●							PHG 115	10 333550 0464	7,85	
	TCMT 110212-MP	●		●							PHG 125	10 333550 0465	7,85	
	TCMT 110212-MP	●		●							PHG 115	10 333550 0564	7,85	
	TCMT 110212-MP	●		●							PHG 125	10 333550 0565	7,85	
	TCMT 11T304-MP	●									PH 5115	10 333550 0622	6,80	
	TCMT 11T304-MP	●									PH 5125	10 333550 0623	6,80	
	TCMT 11T308-MP	●									PH 5115	10 333550 0722	6,80	
	TCMT 11T308-MP	●									PH 5125	10 333550 0723	6,80	
	TCMT 11T312-MP	●									PH 5115	10 333550 0822	6,80	
	TCMT 11T312-MP	●									PH 5125	10 333550 0823	6,80	
	TCMT 16T304-MP	●			●							PHG 115	10 333550 0964	8,10
	TCMT 16T304-MP	●			●							PHG 125	10 333550 0965	8,10
TCMT 16T308-MP	●			●							PHG 115	10 333550 1064	8,10	
TCMT 16T308-MP	●			●							PHG 125	10 333550 1065	8,10	
TCMT 16T312-MP	●			●							PHG 115	10 333550 1164	8,10	
TCMT 16T312-MP	●			●							PHG 125	10 333550 1165	8,10	
TCMT 220408-MP	●										PH 5115	10 333550 1222	11,40	
TCMT 220408-MP	●										PHG 125	10 333550 1265	13,25	

3148

ISO	PH 5115	PH 5125	PHG 115	PHG 125
ISO P steel	Vc = 110 - 350	Vc = 100 - 295	Vc = 110 - 270	Vc = 100 - 240
ISO K cast iron			Vc = 110 - 270	Vc = 100 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.06 - 0.60 ap = 0.19 - 3.60		f = 0.06 - 0.6 ap = 0.19 - 3.6	f = 0.08 - 0.60

Chip breaker MP5

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	•	○	ISO designation									
	TCMT 090204-MP5	●	○							ACP 25 T	10 366665 0025	7,45
	TCMT 110204-MP5	●		○						ACP 15 T	10 366665 0115	7,45
		●	○							ACP 25 T	10 366665 0225	7,45
	TCMT 110208-MP5	●	○							ACP 35 T	10 366665 0325	7,45
		●								ACP 35 T	10 366665 0535	7,45
	TCMT 16T304-MP5	●	○							ACP 25 T	10 366665 0625	9,55
		●								ACP 35 T	10 366665 0735	9,55
TCMT 16T308-MP5	●	○							ACP 25 T	10 366665 0825	9,55	
	●								ACP 35 T	10 366665 0935	9,55	
TCMT 16T312-MP5	●	○							ACP 25 T	10 366665 1025	9,55	

3135

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5		

Chip breaker type MP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	•	-	ISO designation										
	TCMT 110204-MP	●		○						HC 7610	10 311501 1511	7,10	
		●		○						HC 7620	10 311501 1512	7,10	
		●								HC 7630	10 311501 1513	7,10	
	TCMT 16T304-MP	●		○							HC 7610	10 311501 3411	9,10
		●									HC 7620	10 311501 3412	9,10
		●									HC 7630	10 311501 3413	9,10
	TCMT 16T308-MP	●		○							HC 7610	10 311501 3511	9,10
●										HC 7620	10 311501 3512	9,10	
●										HC 7630	10 311501 3513	9,10	

3147

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 110 - 250	Vc = 110 - 250	Vc = 110 - 250
ISO K cast iron	Vc = 140 - 240	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.4 - 3.0		



Ground sharp ...

... optimal chip control.

**ATORN®**  
Performance demands quality

# ISO indexable cutting inserts TC.. ISO M

**ISO M**

• 60° triangular, positive 7°

## Chip breaker FM

F finishing ●	M medium -	R roughing -	<b>palbit</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
<p>Micro finishing</p>	TCMT 090202-FM				●			●		PH 7920	10 333547 0350	6,80	
	TCMT 090204-FM				●				●		PHS 225	10 333547 0372	7,50
	TCMT 110202-FM				●				●		PH 7920	10 333547 0450	6,80
	TCMT 110202-FM				●						PHS 225	10 333547 0472	7,50
	TCMT 110204-FM				●				●		PH 7920	10 333547 0550	6,80
	TCMT 110204-FM				●						PHS 225	10 333547 0572	7,85
	TCMT 110204-FM				●				●		PH 7920	10 333547 0650	6,80
	TCMT 110204-FM				●						PHS 225	10 333547 0672	7,85
TCMT 110208-FM				●				●		PH 7920	10 333547 0750	6,80	
TCMT 110208-FM				●						PHS 225	10 333547 0772	7,85	
TCMT 16T304-FM				●				●		PH 7920	10 333547 1150	7,05	
TCMT 16T304-FM				●						PHS 225	10 333547 1172	8,10	

3148

ISO	PH 7920	PHS 225
ISO M stainless steel	Vc = 100 - 235	Vc = 90 - 240
ISO S superalloys	Vc = 25 - 150	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.45 ap = 0.06 - 2.40	

## Chip breaker FM1

F finishing ●	M medium ○	R roughing -	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
<p>Finishing</p>	TCMT 110202-FM1			○	●					APM 25 T	10 366667 0121	7,45

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.2 ap = 0.25 - 3.0

## Chip breaker MM3

F finishing -	M medium ●	R roughing ○	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
<p>Medium machining</p>	TCMT 090204-MM3			○	●					APM 25 T	10 366664 0121	7,45	
	TCMT 110204-MM3			○	●						APM 25 T	10 366664 0122	7,45
	TCMT 110204-MM3			○	●						APM 35 T	10 366664 0222	7,45
	TCMT 110208-MM3			○	●						APM 25 T	10 366664 0321	7,45
	TCMT 110208-MM3			○	●						APM 35 T	10 366664 0322	7,45
	TCMT 16T304-MM3			○	●						APM 25 T	10 366664 0421	9,55
	TCMT 16T308-MM3			○	●						APM 25 T	10 366664 0621	9,55
	TCMT 16T312-MM3			○	●						APM 25 T	10 366664 0721	9,55

3135

ISO	APM 25 T	APM 35 T
ISO P steel	Vc = 60 - 250	Vc = 90 - 200
ISO M stainless steel	Vc = 40 - 250	Vc = 55 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.0	

## Chip breaker type MP, stainless steel

F finishing -	M medium ●	R roughing -	<b>ATORN</b> ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
<p>Medium machining</p>	TCMT 110204-MP				●			○		HC 7520	10 310501 1525	7,10	
	TCMT 16T304-MP				●				○		HC 7520	10 310501 3425	9,10
	TCMT 16T308-MP				●				○		HC 7520	10 310501 3525	9,10
	TCMT 16T308-MP				●				○		HC 7530	10 310501 3526	9,10

3147

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 80 - 210	Vc = 90 - 160
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.4 - 3.0	

## ISO indexable cutting inserts TC.. ISO K

- 60° triangular, positive 7°

**ISO K**

### Chip breaker MK

F finishing	M medium	R roughing	<b>ATORN®</b>						Quality	art.no.	€		
-	•	○	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H				ISO designation	
<p>Medium machining</p>			TCMT 090204-MK	○		●				ACK 20 T	10	366663 0130	7,45
			TCMT 110204-MK	○		●			ACK 20 T	10	366663 0230	7,45	
			TCMT 110208-MK	○		●			ACK 20 T	10	366663 0330	7,45	
			TCMT 16T304-MK	○		●			ACK 20 T	10	366663 0430	9,55	
			TCMT 16T308-MK	○		●			ACK 20 T	10	366663 0530	9,55	

3135

ISO	ACK 20 T
ISO P steel	Vc = 150 - 350
ISO K cast iron	Vc = 150 - 550
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.18 - 0.5 ap = 0.25 - 4.0

## ISO indexable cutting inserts TC.. ISO N

- 60° triangular, positive 7°

**ISO N**

### Chip breaker MN5

F finishing	M medium	R roughing	<b>ATORN®</b>						Quality	art.no.	€	
○	○	○	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H				ISO designation
<p>Universal application</p>			TCGT 110204-MN5			○	●	○	AWN 15 T	10	366662 0116	10,80
			TCGT 16T304-MN5		○	○	●	○	APN 15 T	10	366662 0217	12,95
			TCGT 16T308-MN5			○	●	○	AWN 15 T	10	366662 0316	13,05
			TCGT 16T308-MN5			○	●	○	AWN 15 T	10	366662 0416	13,05

3135

ISO	APN 15 T	AWN 15 T
ISO M stainless steel	Vc = 50 - 140	
ISO K cast iron	Vc = 120 - 200	Vc = 120 - 200
ISO N Al/non-ferrous	Vc = 100 - 2000	Vc = 100 - 2000
ISO S superalloys	Vc = 60 - 120	Vc = 18 - 45
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.4 ap = 0.1 - 4.5	



... with a single tool.

Drilling and turning ...

**ATORN®**  
Performance demands quality

# ISO indexable cutting inserts VB.. ISO P

• 35° rhombic, positive 5°



## Chip breaker FP1

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	<b>ISO designation</b>									
<b>Finishing</b>												
			VBMT 160404-FP1	●		○				ACP 15 T	10 366711 0115	14,45
				●	○					ACP 25 T	10 366711 0125	14,45
				●	○					ACP 35 T	10 366711 0135	14,45
			VBMT 160408-FP1	●		○				ACP 15 T	10 366711 0215	14,45
				●	○					ACP 25 T	10 366711 0225	14,45
				●	○					ACP 35 T	10 366711 0235	14,45

3135

## Chip breaker type SP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	●	-	<b>ISO designation</b>									
<b>Finishing/medium machining</b>												
			VBMT 160404-SP	●		○				HC 7610	10 311563 3711	13,75
				●		○				HC 7620	10 311563 3712	13,75
			VBMT 160408-SP	●		○				HC 7610	10 311563 3811	13,75
				●		○				HC 7620	10 311563 3812	13,75
			VBMT 160412-SP	●		○				HC 7620	10 311563 3912	13,75

3147

## Chip breaker MP5

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	<b>ISO designation</b>									
<b>Medium machining</b>												
			VBMT 160404-MP5	●		○				ACP 15 T	10 366712 0115	14,45
				●	○					ACP 25 T	10 366712 0125	14,45
				●	○					ACP 35 T	10 366712 0135	14,45
			VBMT 160408-MP5	●		○				ACP 15 T	10 366712 0215	14,45
				●	○					ACP 25 T	10 366712 0225	14,45
				●	○					ACP 35 T	10 366712 0235	14,45

3135

## Chip breaker MP2 universal

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	○	<b>ISO designation</b>									
<b>Medium machining</b>												
			VBMT 160404-MP2	●		○				ACP 15 T	10 366677 0115	14,45
				●	○					ACP 25 T	10 366677 0125	14,45
			VBMT 160408-MP2	●		○				ACP 15 T	10 366677 0215	14,45
				●	○					ACP 25 T	10 366677 0225	14,45

3135

## Chip breaker MP

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	<b>ISO designation</b>									
<b>Medium machining</b>												
			VBMT 160404-MP	●		●				PHG 115	10 333563 0164	15,10
				●		●				PHG 115	10 333563 0264	15,10
			VBMT 160408-MP	●		●				PHG 125	10 333563 0265	15,10
			VBMT 160412-MP	●		●				PHG 115	10 333563 0364	15,10

3148

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.2 - 2.5		

ISO	HC 7610	HC 7620
ISO P steel	Vc = 200 - 380	Vc = 140 - 320
ISO K cast iron	Vc = 180 - 280	Vc = 160 - 260
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.08 - 0.25 ap = 0.3 - 2.0	

ISO	ACP 15 T	ACP 25 T	ACP 35 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.3 ap = 0.25 - 3.5		

ISO	ACP 15 T	ACP 25 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240
ISO M stainless steel		Vc = 70 - 210
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.2 - 0.4 ap = 1.0 - 4.0	

ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 350	Vc = 100 - 295
ISO K cast iron	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.32 ap = 0.23 - 2.70	


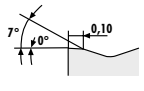


## ISO indexable cutting inserts VB.. ISO M

• 35° rhombic, positive 5°

**ISO M**

### Chip breaker FM1



F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <p>Finishing</p> 	VBMT 160404-FM1	○	●							APM 25 T	10 366714 0121	14,45
	VBMT 160408-FM1	○	●							APM 25 T	10 366714 0221	14,45

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.2 - 2.5

### Chip breaker FM


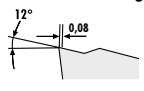
NEW

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Finishing</p> 	VBMT 110302-FM		●					●		PH 7920	10 333561 0150	8,95
	VBMT 110304-FM		●					●		PH 7920	10 333561 0250	8,95
	VBMT 110308-FM		●					●		PH 7920	10 333561 0350	8,95
	VBMT 160402-FM		●					●		PHS 225	10 333561 0472	15,10
	VBMT 160404-FM		●					●		PHS 225	10 333561 0572	15,10
	VBMT 160408-FM		●					●		PHS 225	10 333561 0672	15,10
	VBMT 160412-FM		●					●		PHS 225	10 333561 0772	15,10
	VBMT 160402-FM		●					●		PHS 225	10 333561 0472	15,10

3148

ISO	PH 7920	PHS 225
ISO M stainless steel	Vc = 100 - 235	Vc = 50 - 240
ISO S superalloys	Vc = 23 - 150	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.32 ap = 0.06 - 1.8	

### Chip breaker MM3


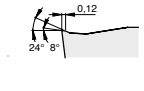
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	●	-	ISO designation									
 <p>Medium machining</p> 	VBMT 160404-MM3	○	●							APM 25 T	10 366713 0121	14,45
	VBMT 160408-MM3	○	●							APM 25 T	10 366713 0221	14,45

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.3 ap = 0.25 - 3.5

### Chip breaker MM

NEW

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	●	-	ISO designation										
 <p>Medium machining</p> 	VBMT 160404-MM		●					●		PH 7910	10 333564 0149	13,-	
			●					●		PH 7920	10 333564 0150	13,-	
	VBMT 160408-MM		●						●		PHS 215	10 333564 0171	15,10
			●						●		PH 7910	10 333564 0249	13,-
			●						●		PH 7920	10 333564 0250	13,-
			●						●		PHS 215	10 333564 0271	15,10
VBMT 160412-MM		●						●		PH 7920	10 333564 0350	13,-	
		●						●		PHS 215	10 333564 0371	15,10	

3148


ISO	PH 7910	PH 7920	PHS 215
ISO M stainless steel	Vc = 100 - 230	Vc = 100 - 235	Vc = 80 - 260
ISO S superalloys	Vc = 33 - 170	Vc = 23 - 150	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.06 - 0.6 ap = 0.19 - 3.6		f = 0.07 - 0.32 ap = 0.23 - 2.7

## ISO indexable cutting inserts VC.. ISO P

• 35° rhombic, positive 7°

**ISO P**

### Chip breaker FU1


F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Finishing</p> <p>18°</p>	VCGT 110301-FU1	●	●					●		HC 7820	10 311530 2712	13,55
	VCGT 110302-FU1	●	●					●		HC 7810	10 311530 2811	13,55
	VCGT 110304-FU1	●	●					●		HC 7820	10 311530 2812	13,55
	VCGT 110304-FU1	●	●					●		HC 7810	10 311530 2911	13,55
	VCGT 110304-FU1	●	●					●		HC 7820	10 311530 2912	13,55
	VCGT 160402-FU1	●	●					●		HC 7810	10 311530 3011	15,80
VCGT 160402-FU1	●	●					●		HC 7820	10 311530 3012	15,80	
VCGT 160404-FU1	●	●					●		HC 7810	10 311530 3111	15,80	
VCGT 160404-FU1	●	●					●		HC 7820	10 311530 3112	15,80	

3147

ISO	HC 7810	HC 7820
ISO P steel	Vc = 80 - 160	Vc = 60 - 130
ISO M stainless steel	Vc = 130 - 220	Vc = 110 - 210
ISO S superalloys	Vc = 40 - 70	Vc = 40 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.25 ap = 0.20 - 2.5	f = 0.02 - 0.25 ap = 0.10 - 2.50

**Excellent chip control**


### Chip breaker FP1

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <p>Finishing</p> <p>7°</p> <p>9°</p> <p>0.10</p>	VCMT 110302-FP1	●		○						ACP 15 T	10 366679 0115	14,45
	VCMT 110302-FP1	●	○	○						ACP 25 T	10 366679 0125	14,45
	VCMT 110304-FP1	●		○						ACP 15 T	10 366679 0215	14,45
	VCMT 110304-FP1	●	○	○						ACP 25 T	10 366679 0225	14,45
	VCMT 160404-FP1	●		○						ACP 15 T	10 366679 0315	16,50
VCMT 160404-FP1	●	○	○						ACP 25 T	10 366679 0325	16,50	
VCMT 160408-FP1	●	○	○						ACP 25 T	10 366679 0425	16,50	

3135

ISO	ACP 15 T	ACP 25 T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240
ISO M stainless steel		Vc = 70 - 210
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.2 - 2.5	


### Chip breaker type FP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Finishing</p> <p>20°</p>	VCMT 110302-FP		●					●		HC 7520	10 311528 0125	13,75
	VCMT 110302-FP	●		○						HC 7610	10 311601 1611	13,75
	VCMT 110302-FP	●		○						HC 7620	10 311601 1612	13,75
	VCMT 110304-FP	●		○				●		HC 7520	10 311528 0225	13,75
	VCMT 110304-FP	●		○						HC 7610	10 311601 1711	13,75
	VCMT 110304-FP	●		○						HC 7620	10 311601 1712	13,75
	VCMT 160402-FP		●					●		HC 7520	10 311528 0325	16,-
	VCMT 160402-FP	●		○						HC 7610	10 311601 3611	15,70
	VCMT 160402-FP	●		○						HC 7620	10 311601 3612	15,70
	VCMT 160404-FP		●					●		HC 7520	10 311528 0425	16,-
	VCMT 160404-FP	●		○						HC 7610	10 311601 3711	15,70
	VCMT 160404-FP	●		○						HC 7620	10 311601 3712	15,70
VCMT 160408-FP		●					●		HC 7520	10 311528 0525	16,-	

3147

ISO	HC 7520	HC 7610	HC 7620
ISO P steel		Vc = 200 - 380	Vc = 140 - 320
ISO M stainless steel	Vc = 150 - 220		
ISO K cast iron		Vc = 180 - 280	Vc = 160 - 260
ISO S superalloys	Vc = 30 - 60		
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.04 - 0.16 ap = 0.1 - 1.5		

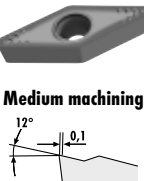
### Chip breaker MP5

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	ISO designation									
 <p>Medium machining</p> <p>12°</p> <p>0.08</p>	VCMT 110304-MP5	●	○	○						ACP 25 T	10 366682 0125	14,45
	VCMT 110304-MP5	●	○							ACP 35 T	10 366682 0235	14,45
	VCMT 110308-MP5	●	○	○						ACP 25 T	10 366682 0325	14,45
	VCMT 110308-MP5	●	○							ACP 35 T	10 366682 0435	14,45
	VCMT 160404-MP5	●	○	○						ACP 25 T	10 366682 0525	16,50
	VCMT 160404-MP5	●	○							ACP 35 T	10 366682 0635	16,50
	VCMT 160408-MP5	●	○	○						ACP 25 T	10 366682 0725	16,50
	VCMT 160408-MP5	●	○							ACP 35 T	10 366682 0835	16,50

3135


ISO	ACP 25 T	ACP 35 T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5	

Chip breaker type MP

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
-	●	-	ISO designation										
 <p>Medium machining</p>	VCMT 110304-MP	●		○						HC 7610	10 311603 1711	13,75	
		●		○						HC 7620	10 311603 1712	13,75	
		●								HC 7630	10 311603 1713	13,75	
	VCMT 110308-MP	●		○							HC 7610	10 311603 1811	13,75
		●		○							HC 7620	10 311603 1812	13,75
		●									HC 7630	10 311603 1813	13,75
	VCMT 160404-MP	●		○							HC 7610	10 311603 3711	15,70
		●		○							HC 7620	10 311603 3712	15,70
		●									HC 7630	10 311603 3713	15,70
	VCMT 160408-MP	●		○							HC 7610	10 311603 3811	15,70
		●		○							HC 7620	10 311603 3812	15,70
		●									HC 7630	10 311603 3813	15,70

3147

Chip breaker type MP

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€	
○	●	-	ISO designation										
 <p>Medium machining</p>	VCMT 110304-MP	●		●						PHG 115	10 333570 0164	10,35	
		●		●							PHG 125	10 333570 0165	10,35
	VCMT 110308-MP	●		●							PHG 115	10 333570 0264	10,35
		●		●							PHG 125	10 333570 0265	10,35
	VCMT 160408-MP	●		●							PHG 115	10 333570 0464	13,25
		●		●							PHG 125	10 333570 0465	13,25
	VCMT 160412-MP	●		●							PHG 115	10 333570 0564	13,25
		●		●							PHG 125	10 333570 0565	13,25

3148

ISO	HC 7610	HC 7620	HC 7630
ISO P steel	Vc = 160 - 340	Vc = 110 - 250	Vc = 80 - 220
ISO K cast iron	Vc = 180 - 280	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.4 - 2.5		


ISO	PHG 115	PHG 125
ISO P steel	Vc = 110 - 350	Vc = 100 - 295
ISO K cast iron	Vc = 110 - 350	Vc = 100 - 295
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.10 - 0.33 ap = 0.23 - 2.70	

ISO indexable cutting inserts VC.. ISO M

- 35° rhombic, positive 7°




Chip breaker FFM stainless steel version

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	-	-	ISO designation									
 <p>Micro finishing</p>	VCGT 110300-FFM		●	○	○	○	○	○	○	APM 20 T	10 366678 0120	16,30
	VCGT 110301-FFM		●	○	○	○	○	○	○	APM 20 T	10 366678 0220	16,30
	VCGT 160400-FFM		●	○	○	○	○	○	○	APM 20 T	10 366678 0320	17,90
	VCGT 160401-FFM		●	○	○	○	○	○	○	APM 20 T	10 366678 0420	17,90

3135

ISO	APM 20 T
ISO M stainless steel	Vc = 60 - 200
ISO K cast iron	Vc = 120 - 220
ISO N Al/non-ferrous	Vc = 100 - 600
ISO S superalloys	Vc = 15 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.02 - 0.14 ap = 0.05 - 1.35

Chip breaker FM1


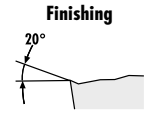
F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <p>Finishing</p>	VCMT 110302-FM1	○	●							APM 25 T	10 366681 0121	14,45
	VCMT 110304-FM1	○	●							APM 25 T	10 366681 0221	14,45
	VCMT 160404-FM1	○	●							APM 25 T	10 366681 0321	16,50

3135

ISO	APM 25 T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.25 ap = 0.2 - 2.5


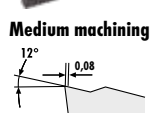
Continued on next page >>>

Chip breaker type FS

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
			VCMT 160404-FS		●			○		HC 7220	10 311601 3714	15,70
 <p>Finishing</p>												


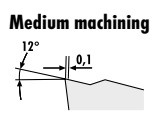
3147

Chip breaker MM3

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
			VCMT 110304-MM3	○	●					APM 25 T	10 366683 0121	14,45
 <p>Medium machining</p>			VCMT 110308-MM3	○	●					APM 35 T	10 366683 0222	14,45
			VCMT 110308-MM3	○	●					APM 25 T	10 366683 0321	14,45
			VCMT 110308-MM3	○	●					APM 35 T	10 366683 0422	14,45
			VCMT 160404-MM3	○	●					APM 25 T	10 366683 0521	16,50
			VCMT 160408-MM3	○	●					APM 25 T	10 366683 0621	16,50



3135

Chip breaker type MP, stainless steel

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
			VCMT 110304-MP		●			○		HC 7520	10 310603 1725	13,75
 <p>Medium machining</p>			VCMT 110308-MP		●			○		HC 7530	10 310603 1726	13,75
			VCMT 110308-MP		●			○		HC 7520	10 310603 1825	13,75
			VCMT 160404-MP		●			○		HC 7520	10 310603 3725	16,-
			VCMT 160404-MP		●			○		HC 7530	10 310603 3726	16,-
			VCMT 160408-MP		●			○		HC 7520	10 310603 3825	16,-
		VCMT 160408-MP		●			○		HC 7530	10 310603 3826	16,-	


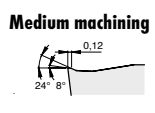
3147

Chip breaker type FM

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
			VCMT 110302-FM		●					PHS 225	10 333568 0172	10,35
 <p>Finishing</p>			VCMT 110304-FM		●					PHS 225	10 333568 0272	10,35
			VCMT 160402-FM		●					PHS 225	10 333568 0372	13,25
			VCMT 160404-FM		●					PHS 225	10 333568 0472	13,25
			VCMT 160408-FM		●					PHS 225	10 333568 0572	13,25
			VCMT 160412-FM		●					PHS 225	10 333568 0672	13,25
			VCMT 160412-FM		●					PHS 225	10 333568 0672	13,25

3148

Chip breaker type MM

F finishing	M medium	R roughing	<b>palbit</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
			ISO designation									
			VCMT 110304-MM		●					PHS 215	10 333571 0171	10,35
 <p>Medium machining</p>			VCMT 110308-MM		●					PHS 215	10 333571 0271	10,35
			VCMT 160404-MM		●					PHS 215	10 333571 0371	13,25
			VCMT 160408-MM		●					PHS 215	10 333571 0471	13,25
			VCMT 160412-MM		●					PHS 215	10 333571 0571	13,25
			VCMT 160412-MM		●					PHS 215	10 333571 0571	13,25

3148

ISO	HC 7220
ISO M stainless steel	Vc = 120 - 190
ISO S superalloys	Vc = 30 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.16 ap = 0.1 - 1.5

ISO	APM 25 T	APM 35 T
ISO P steel	Vc = 60 - 250	Vc = 90 - 200
ISO M stainless steel	Vc = 40 - 250	Vc = 55 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5	

ISO	HC 7520	HC 7530
ISO M stainless steel	Vc = 80 - 210	Vc = 90 - 160
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.4 - 2.5	

ISO	PHS 225
ISO M stainless steel	Vc = 50 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.07 - 0.32 ap = 0.07 - 1.80

ISO	PHS 215
ISO M stainless steel	Vc = 50 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.06 - 0.6 ap = 0.19 - 3.6

## ISO indexable cutting inserts VC.. ISO N

**ISO N**

• 35° rhombic, positive 7°

### Chip breaker MN5

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	○	○	<b>ISO designation</b>									
			<b>Universal application</b>			○	●	○		<b>AWN 15 T</b>	10 <b>366680</b> 0116	<b>13,05</b>
			VCGT 110302-MN5		○	○	●	○		<b>APN 15 T</b>	10 366680 0317	<b>15,30</b>
			VCGT 110304-MN5		○	○	●	○		<b>AWN 15 T</b>	10 366680 0216	<b>13,05</b>
			VCGT 130302-MN5		○	○	●	○		<b>APN 15 T</b>	10 366680 0417	<b>15,30</b>
			VCGT 130304-MN5		○	○	●	○		<b>AWN 15 T</b>	10 366680 0616	<b>13,50</b>
			VCGT 160404-MN5		○	○	●	○		<b>AWN 15 T</b>	10 366680 0717	<b>15,70</b>
			VCGT 160408-MN5		○	○	●	○		<b>APN 15 T</b>	10 366680 0917	<b>17,70</b>
			VCGT 160412-MN5		○	○	●	○		<b>AWN 15 T</b>	10 366680 1017	<b>15,70</b>
			VCGT 220530-MN5		○	○	●	○		<b>APN 15 T</b>	10 366680 1217	<b>17,70</b>
			VCGT 220530-MN5		○	○	●	○		<b>APN 15 T</b>	10 366680 1317	<b>17,70</b>
			VCGT 220530-MN5		○	○	●	○		<b>APN 15 T</b>	10 366680 1417	<b>23,-</b>

3135

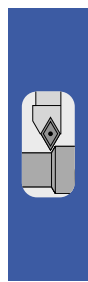
ISO	APN 15 T	AWN 15 T
<b>ISO M</b> stainless steel	Vc = 50 - 140	
<b>ISO K</b> cast iron	Vc = 120 - 200	Vc = 120 - 200
<b>ISO N</b> Al/non-ferrous	Vc = 100 - 3000	Vc = 100 - 2000
<b>ISO S</b> superalloys	Vc = 18 - 120	Vc = 18 - 45
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.1 - 0.5 ap = 0.1 - 4.5	

### Chip breaker MN

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	●	-	<b>ISO designation</b>									
			<b>Finishing/medium machining</b>		○		●			<b>HC 6310</b>	10 <b>310909</b> 1641	<b>15,60</b>
			VCGT 110302-MN		○		●			<b>HC 6310</b>	10 310909 1741	<b>15,60</b>
			VCGT 160404-MN		○		●			<b>HC 6310</b>	10 310909 3741	<b>17,-</b>
			VCGT 160408-MN		○		●			<b>HC 6310</b>	10 310909 3841	<b>17,-</b>

3147

ISO	HC 6310
<b>ISO M</b> stainless steel	Vc = 120 - 200
<b>ISO N</b> Al/non-ferrous	Vc = 160 - 1000
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.16 ap = 0.3 - 2.0



## ISO indexable cutting inserts WC.. ISO P

**ISO P**

• 80° trigonometric, positive 7°

### Chip breaker MP5

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	<b>ISO designation</b>									
			<b>Medium machining</b>	●	○	○				<b>ACP 25 T</b>	10 <b>366690</b> 0125	<b>9,35</b>
			WCMT 040204-MP5	●	○	○				<b>ACP 25 T</b>	10 366690 0225	<b>9,35</b>
			WCMT 06T304-MP5	●	○	○				<b>ACP 25 T</b>	10 366690 0325	<b>11,15</b>
			WCMT 06T308-MP5	●	○	○				<b>ACP 25 T</b>	10 366690 0425	<b>11,15</b>
			WCMT 080404-MP5	●	○	○				<b>ACP 25 T</b>	10 366690 0525	<b>13,10</b>
			WCMT 080408-MP5	●	○	○				<b>ACP 25 T</b>	10 366690 0625	<b>13,10</b>
			WCMT 080412-MP5	●	○	○				<b>ACP 25 T</b>	10 366690 0725	<b>13,10</b>

3135

ISO	ACP 25 T
<b>ISO P</b> steel	Vc = 100 - 240
<b>ISO M</b> stainless steel	Vc = 70 - 210
<b>ISO K</b> cast iron	Vc = 120 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5

## ISO indexable cutting inserts WC.. ISO M

**ISO M**

• 80° trigonometric, positive 7°

### Chip breaker MM3

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
-	●	-	<b>ISO designation</b>									
			<b>Medium machining</b>	○	●					<b>APM 25 T</b>	10 <b>366691</b> 0121	<b>9,35</b>
			WCMT 040204-MM3	○	●					<b>APM 25 T</b>	10 366691 0221	<b>9,35</b>
			WCMT 06T304-MM3	○	●					<b>APM 25 T</b>	10 366691 0321	<b>11,15</b>
			WCMT 06T308-MM3	○	●					<b>APM 25 T</b>	10 366691 0421	<b>11,15</b>
			WCMT 080404-MM3	○	●					<b>APM 25 T</b>	10 366691 0521	<b>13,10</b>
			WCMT 080408-MM3	○	●					<b>APM 25 T</b>	10 366691 0621	<b>13,10</b>
			WCMT 080412-MM3	○	●					<b>APM 25 T</b>	10 366691 0721	<b>13,10</b>

3135

ISO	APM 25 T
<b>ISO P</b> steel	Vc = 60 - 250
<b>ISO M</b> stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5

## ISO indexable cutting inserts ceramic

Ceramic indexable cutting inserts are made of an inorganic substance.


They are die pressed and sintered using very fine pure raw material.

The ceramic indexable cutting inserts are completely compacted in this process, which means they have:

- **Resistance to breakage and wear**
- **Longer tool service life due to outstanding wear resistance**
- **Accurate cutting and exceptional surface roughness**
- **Greater cutting speed compared to carbide indexable cutting inserts**

Other geometries, edge preparations and coatings are available on request.


### CNGA 1204..

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <b>Finishing</b>			CNGA 120404 T02020	○		●			●	AKH 300 T	10 368100 0001	15,70
			CNGA 120408 T02020	○		●			●	AKH 300 T	10 368100 0002	15,70
			CNGA 120412 S02020	○		●			●	AKH 300 T	10 368100 0003	15,70

3163

ISO	AKH 300 T
ISO P steel	Vc = 200 - 800
ISO K cast iron	Vc = 50 - 1200
ISO H hard	Vc = 20 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.50 ap = 0.10 - 0.50


### DNGA 1506..

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <b>Finishing</b>			DNGA 150604 T02020	○		●			●	AKH 300 T	10 368101 0001	19,45
			DNGA 150608 T02020	○		●			●	AKH 300 T	10 368101 0002	19,45
			DNGA 150612 S02020	○		●			●	AKH 300 T	10 368101 0003	19,45

3163

ISO	AKH 300 T
ISO P steel	Vc = 200 - 800
ISO K cast iron	Vc = 50 - 1200
ISO H hard	Vc = 40 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.50 ap = 0.10 - 0.50

### VNGA 1604..

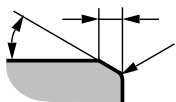
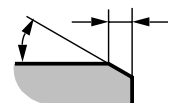
F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
 <b>Finishing</b>			VNGA 160404 T02020	○		●			●	AKH 300 T	10 368102 0001	22,30
			VNGA 160408 T02020	○		●			●	AKH 300 T	10 368102 0002	22,30
			VNGA 160412 S02020	○		●			●	AKH 300 T	10 368102 0003	22,30

3163

ISO	AKH 300 T
ISO P steel	Vc = 200 - 800
ISO K cast iron	Vc = 50 - 1200
ISO H hard	Vc = 40 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.50 ap = 0.10 - 0.50

## Cutting edge design of ceramic indexable cutting inserts

INFO

Symbol	Cutting edge design	Example		Shape
<b>S</b>	Chamfered and rounded cutting edge	CNGA 120412 <b>S02020</b>	0.20 mm x 20° chamfered and rounded cutting edge	
<b>T</b>	Chamfered cutting edge	CNGA 120404 <b>T02020</b>	0.20 mm x 20° chamfered cutting edge	

## Technical Information CBN Indexable Cutting Inserts

**INFO**

CBN (polycrystalline cubic boron nitride) does not occur naturally. It is a synthetic material that is manufactured through a process of high temperature and pressure. When CBN cutting edges are soldered to a carbide insert, this creates a high-performance cutting tool. CBN indexable cutting inserts are **brilliant for finishing and semi-finishing hardened steels (with 45 to 68 HRC)**, as well as hard cast iron and heat-resistant superalloys.

### Qualities

PBY 603	PBY 620
low CBN content with medium grain size and ceramic binding	minimal CBN content with medium grain size and ceramic binding
high wear/abrasion resistance	improved crater/side wear resistance with an exceptionally balanced toughness
for continuous and partially interrupted cutting of hardened steel (H01-H10)	for moderate to severely interrupted cutting of all hardened steels (H10-H20)
finishing of abrasive, high-strength cast iron	
also suitable for machining heat-resistant superalloys (S10)	

### Geometry selection

The indexable insert geometry and the edge preparation is extremely important in hard turning, as it has a significant impact on the tool service life and productivity. The PALBIT product range includes standard and WIPER indexable cutting inserts.

The standard indexable insert produces the lowest cutting forces and has the lowest stability requirements, while the WIPER indexable cutting insert creates high productivity and outstanding surface quality.

A large corner radius guarantees greater edge strength and thus ensures a longer service life of the indexable cutting insert. For this reason it is advised to select the greatest permissible corner radius for the respective process requirements.

WIPER indexable cutting inserts provide two options in process improvement:

- improved surface quality with standard cutting data
- consistent surface quality with considerably higher feed rate.

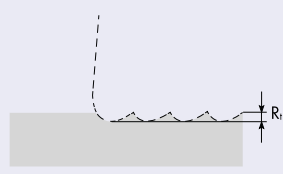
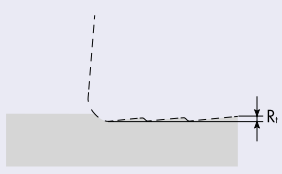
### Selection of cutting edge preparation

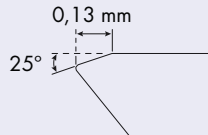
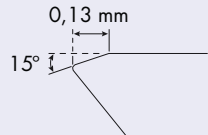
Defining the correct cutting edge preparation is the key criterion for the stability and service life of the cutting edges.

Selection is required to produce the best economic result.

### Edge preparation S

- with chamfer and edge rounding
- first choice for hard turning parts
- stronger cutting edge, with greater resistance to nicks and breaks
- generates a uniform surface quality
- critical for uninterrupted cutting and when using large cutting depths
- The feed rate must be greater than the edge rounding.

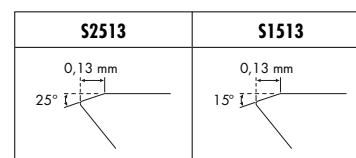
Standard (r = 0.8 mm)	WIPER (r = 0.8 mm)
	
<b>Surface roughness Ra = 0.81 µm</b>	<b>Surface roughness Ra = 0.42 µm</b>

S2513	S1513
	
<b>for general machining</b>	<b>for stable continuous machining</b>





• ultra-hard cutting material



#### CNGA Z2

ISO designation	Quality	art.no.	€
CNGA 120404-S2513 Z2	PBY 603	<b>392000</b> 0188	42,10
CNGA 120404-S2513 Z2	PBY 620	392000 0189	42,10
CNGA 120408-S2513 Z2	PBY 603	392000 0288	42,10
CNGA 120408-S2513 Z2	PBY 620	392000 0289	42,10
CNGA 120412-S2513 Z2	PBY 603	392000 0388	42,10
CNGA 120412-S2513 Z2	PBY 620	392000 0389	42,10

3155



#### CNGA Z4

ISO designation	Quality	art.no.	€
CNGA 120404-S2513 Z4	PBY 603	<b>392001</b> 0188	54,-
CNGA 120408-S2513 Z4	PBY 603	392001 0288	54,-
CNGA 120412-S2513 Z4	PBY 603	392001 0388	54,-

3155



#### CNGA S1513 WG Z4

ISO designation	Quality	art.no.	€
CNGA 120408-S1513 WG Z4	PBY 603	<b>392002</b> 0188	121,50
CNGA 120408-S1513 WG Z4	PBY 620	392002 0189	121,50

3155



#### CNGA S2513 WG Z4

ISO designation	Quality	art.no.	€
CNGA 120408-S2513 WG Z4	PBY 603	<b>392003</b> 0188	121,50
CNGA 120408-S2513 WG Z4	PBY 620	392003 0189	121,50

3155



#### DNGA Z2

ISO designation	Quality	art.no.	€
DNGA 150404-2513 Z2	PBY 620	<b>392004</b> 0189	40,20
DNGA 150408-2513 Z2	PBY 620	392004 0289	40,20
DNGA 150604-2513 Z2	PBY 603	392004 0388	41,30
DNGA 150604-2513 Z2	PBY 620	392004 0389	41,30
DNGA 150608-2513 Z2	PBY 603	392004 0488	41,30
DNGA 150608-2513 Z2	PBY 620	392004 0489	41,30
DNGA 150612-2513 Z2	PBY 603	392004 0588	41,30
DNGA 150612-2513 Z2	PBY 620	392004 0589	41,30

3155



#### DNGA Z4

ISO designation	Quality	art.no.	€
DNGA 150604-S2513 Z4	PBY 603	<b>392005</b> 0188	52,40
DNGA 150608-S2513 Z4	PBY 603	392005 0288	52,40
DNGA 150612-S2513 Z4	PBY 603	392005 0388	52,40

3155



**TNGA Z3**

ISO designation	Quality	art.no.	€
TNGA 160404-S2513 Z3	PBY 603	<b>392007</b> 0188	<b>65,60</b>
TNGA 160404-S2513 Z3	PBY 620	392007 0189	<b>65,60</b>
TNGA 160408-S2513 Z3	PBY 603	392007 0288	<b>65,60</b>
TNGA 160408-S2513 Z3	PBY 620	392007 0289	<b>65,60</b>
TNGA 160412-S2513 Z3	PBY 603	392007 0388	<b>65,60</b>
TNGA 160412-S2513 Z3	PBY 620	392007 0389	<b>65,60</b>

3155

**TNGA Z6**

ISO designation	Quality	art.no.	€
TNGA 160404-S2513 Z6	PBY 603	<b>392008</b> 0188	<b>87,-</b>
TNGA 160408-S2513 Z6	PBY 603	392008 0288	<b>87,-</b>
TNGA 160412-S2513 Z6	PBY 603	392008 0388	<b>87,-</b>

3155

**VNGA Z2**

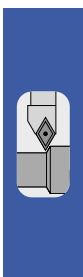
ISO designation	Quality	art.no.	€
VNGA 160404-S2513 Z2	PBY 603	<b>392009</b> 0188	<b>42,10</b>
VNGA 160404-S2513 Z2	PBY 620	392009 0189	<b>42,10</b>
VNGA 160408-S2513 Z2	PBY 603	392009 0288	<b>42,10</b>
VNGA 160408-S2513 Z2	PBY 620	392009 0289	<b>42,10</b>
VNGA 160412-S2513 Z2	PBY 603	392009 0388	<b>42,10</b>
VNGA 160412-S2513 Z2	PBY 620	392009 0389	<b>42,10</b>

3155

**WNGA Z3**

ISO designation	Quality	art.no.	€
WNGA 080404-S2513 Z3	PBY 603	<b>392010</b> 0188	<b>47,60</b>
WNGA 080404-S2513 Z3	PBY 620	392010 0189	<b>47,60</b>
WNGA 080408-S2513 Z3	PBY 603	392010 0288	<b>47,60</b>
WNGA 080408-S2513 Z3	PBY 620	392010 0289	<b>47,60</b>
WNGA 080412-S2513 Z3	PBY 603	392010 0388	<b>47,60</b>
WNGA 080412-S2513 Z3	PBY 620	392010 0389	<b>47,60</b>

3155



## Technical Information PKD Indexable Cutting Inserts

INFO

PKD (polycrystalline diamond) is a composite of diamond particles sintered with a metallic binding agent, which form one of the hardest and most wear-resistant materials for cutting tools.

Its development was significant for the **machining of non-ferrous materials such as aluminium with high silicon content, metal matrix composites (MMC) and carbon-fibre reinforced plastics (CFRP)**.

### Quality

PDP410	
general applications	graphite and graphite composite
fine finishing	wood composite
<14% aluminium silicon alloy	raw ceramic
automotive industry	copper alloy

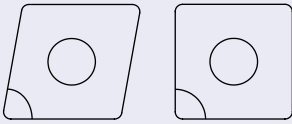
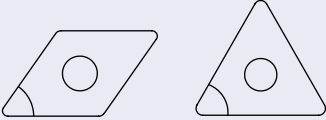
### Geometry selection

Insert geometry and corner radius are crucial to service life and productivity in turning work.

#### The corner radius of the indexable cutting insert is an important performance parameter:

- A smaller corner radius must be selected for good chip breaking: 0.2 - 0.4 mm
- A large corner radius: 0.8 - 1.2 mm produces a greater surface quality and narrower chips, whereby the crater wear in hard turning is reduced.
- Machining with greater corner radius and smaller cutting depth results in lower entry and exit force.

**In general, a greater corner radius ensures increased cutting stability and thus an increased service life. For this reason it is advisable to use the largest-possible corner radius according to the specific requirements.**

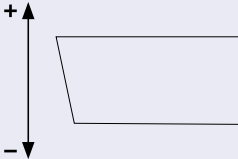
Finishing and Semi-finishing	
Special surface and tolerance requirements apply in these cases.	
Roughing	
The following formula is recommended to calculate the minimum corner radius in relation to the feed for roughing:	
Insert shape	Formula
	Radius > 1.6 x feed per rev.
	Radius > 2.5 x feed per rev.

### Selection of cutting edge preparation

Choosing the correct cutting edge preparation is the key criterion for the stability and service life of the cutting edge. It determines the degree of efficiency.

#### Cutting edge preparation

PKD: Cutting edge preparation F-type:

<p>Cutting forces Cutting strength</p> 	<p><b>F-standard preparation without honing - Standard</b></p> <ul style="list-style-type: none"> <li>• sharp cutting edge</li> <li>• standard/cutting edge preparation for aluminium or other non-ferrous materials.</li> </ul>
---	--

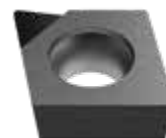


- **Polycrystalline diamond** (composite cutting material) with carbide base, good cutting edge sharpness and low cutting pressure with narrow tolerances. Lower wear resistance with increased toughness.

**CCGT Z1**

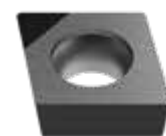
ISO designation	Quality	art.no.	€
CCGT 060202 Z1	PDP 410	<b>392600</b> 0106	<b>38,10</b>
CCGT 09T308 Z1	PDP 410	392600 0206	<b>42,10</b>
CCGT 120408 Z1	PDP 410	392600 0306	<b>42,10</b>

2173

**CCGW Z1**

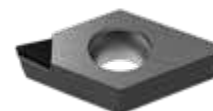
ISO designation	Quality	art.no.	€
CCGW 060202 Z1	PDP 410	<b>392601</b> 0106	<b>38,10</b>
CCGW 060204 Z1	PDP 410	392601 0206	<b>38,10</b>
CCGW 09T304 Z1	PDP 410	392601 0306	<b>42,10</b>
CCGW 120404 Z1	PDP 410	392601 0406	<b>42,10</b>
CCGW 120408 Z1	PDP 410	392601 0506	<b>42,10</b>

2173

**DCGT Z1**

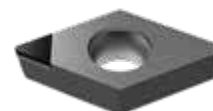
ISO designation	Quality	art.no.	€
DCGT 070202 Z1	PDP 410	<b>392602</b> 0106	<b>38,10</b>
DCGT 11T304 Z1	PDP 410	392602 0206	<b>42,10</b>
DCGT 11T308 Z1	PDP 410	392602 0306	<b>42,10</b>
DCGT 150408 Z1	PDP 410	392602 0406	<b>121,50</b>

2173

**DCGW Z1**

ISO designation	Quality	art.no.	€
DCGW 070202 Z1	PDP 410	<b>392603</b> 0106	<b>38,10</b>
DCGW 070204 Z1	PDP 410	392603 0206	<b>38,10</b>
DCGW 11T302 Z1	PDP 410	392603 0306	<b>42,10</b>
DCGW 11T304 Z1	PDP 410	392603 0406	<b>42,10</b>
DCGW 11T308 Z1	PDP 410	392603 0506	<b>42,10</b>
DCGW 150408 Z1	PDP 410	392603 0606	<b>42,10</b>

2173

**SCGT Z1**

ISO designation	Quality	art.no.	€
SCGT 120408 Z1	PDP 410	<b>392604</b> 0106	<b>42,10</b>

2173



Continued on next page &gt;&gt;&gt;

## TCGT Z1

ISO designation	Quality	art.no.	€
TCGT 090202 Z1	PDP 410	<b>392605</b> 0106	<b>38,10</b>
TCGT 090204 Z1	PDP 410	392605 0206	<b>38,10</b>
TCGT 090208 Z1	PDP 410	392605 0306	<b>38,10</b>
TCGT 110204 Z1	PDP 410	392605 0406	<b>42,10</b>
TCGT 110208 Z1	PDP 410	392605 0506	<b>42,10</b>
TCGT 16T308 Z1	PDP 410	392605 0606	<b>42,10</b>

2173



## TCGW Z1

ISO designation	Quality	art.no.	€
TCGW 090202 Z1	PDP 410	<b>392606</b> 0106	<b>38,10</b>
TCGW 090204 Z1	PDP 410	392606 0206	<b>38,10</b>
TCGW 110202 Z1	PDP 410	392606 0306	<b>42,10</b>
TCGW 110204 Z1	PDP 410	392606 0406	<b>42,10</b>
TCGW 110208 Z1	PDP 410	392606 0506	<b>42,10</b>
TCGW 16T308 Z1	PDP 410	392606 0606	<b>42,10</b>

2173



## TPGW Z1

ISO designation	Quality	art.no.	€
TPGW 1103 Z1	PDP 410	<b>392609</b> 0106	<b>42,10</b>

2173



## VCGT Z1

ISO designation	Quality	art.no.	€
VCGT 110302 Z1	PDP 410	<b>392607</b> 0106	<b>41,-</b>
VCGT 110304 Z1	PDP 410	392607 0206	<b>41,-</b>
VCGT 160408 Z1	PDP 410	392607 0306	<b>44,50</b>

2173



## VCGW Z1

ISO designation	Quality	art.no.	€
VCGW 110304 Z1	PDP 410	<b>392608</b> 0106	<b>41,-</b>
VCGW 160408 Z1	PDP 410	392608 0206	<b>44,50</b>

2173



# THE COMPLETE MACHINING RANGE



**PALBIT**  
Machining tools  
411 pages  
Art.no. 019900 0315








Overview of all free manufacturers' catalogues  
on page 16/17

## Overview of tool holders and boring bars



ISO designation codes  
in the INFO section

INFO


## Tool holders negative

ISO code	Rotational direction	for ISO indexable cutting inserts	Internal cooling	Page
PCLN R/L 95°	↔	CN..		912
				913
DCLN R/L 95°				913
MCLN R/L 95°				914
PCKN R/L 75°	↑			915
PCBN R/L 75°	←			915
PDJN R/L 93°	↔	DN..		916
				916
				917
DDJN R/L 93°				917
MDJN R/L 93°				918
PDNN 63°	↔			918
CKJN R/L 93°	↔	KNUX		919
PSBN R/L 75°	←	SN..		919
PSKN R/L 75°	↑			920
PSSN R/L 45°	↖			920
PSDNN 45°	↗			921
PTFN R/L 90°	↑	TN..		922
PTGN R/L 90°	←			922
DVJN R/L 93°	↖	VN..		923
				923
MVJN R/L 93°				924
MVVNN 72,5°	↔			924
PWLN R/L 95°	↔	WN..		924
				925
DWLN R/L 95°				925
				926
MWLN R/L 95°				926

## Tool holders positive





ISO code	Rotational direction	for ISO indexable cutting inserts	Internal cooling	Page
SCLC R/L 95°	↔	CC..		927
				927
SCAC R/L 90°	↔			928
SDJC R/L 93°	↔	DC..		928
			929	
SDAC R/L 90°	↖		929	
SDNCN 62,5°	↔			930

## Tool holders positive (Continued)








ISO code	Rotational direction	for ISO indexable cutting inserts	Internal cooling	Page
SRGC R/L 95°	↖	RC..		931
SRDCN 90°	↔			931
SSSC R/L 45°	↔	SC..		932
SVJC R/L 93°	↖			932
				933
SVAC R/L 90°				
SVVCN 72,5°	↔			934
SVJB R/L 93°	↖	VBM.		935
SVVBN 72,5°	↔			935



## Boring bars negative

ISO code	Rotational direction	for ISO indexable cutting inserts	Internal cooling	Page
CKUN R/L 93°	↖	KNUX		936
PCLN R/L 95°	↖	CN..		936
MCLN R/L 95°				936
PDUN R/L 93°	↖	DN..		937
MDUN R/L 93°				937
PTFN R/L 90°	←	TN..		938
				938
MVUN R/L 93°	↖	VN..		939
PWLN R/L 95°	↖	WN..		939
				939

## Boring bars positive

ISO code	Rotational direction	for ISO indexable cutting inserts	Internal cooling	Page
SCLC R/L 95°	↖	CC..		940
SDUC R/L 93°	↖	DC..		942
SDQC R/L 107,5°	↖			944
SDXC R/L 93°				945
STFC R/L 90°	↖	TC..		945
SVUC R/L 93°	↖	VC..		946
SVJC R/L 52°	↔			946
SVUB R/L 93°	↖	VB..		947

## ATORN® DLOCK coolant supply and outlet

INFO

### Coolant supply

The DLOCK system offers various coolant supply options. Not only are there two inlets on the underside of the holder (1x G1/8 inch and 1x M6 for transition to VDI holder), there is also another on the rear of the square (1x G1/8 inch). The coolant system can thus be connected with the greatest flexibility.

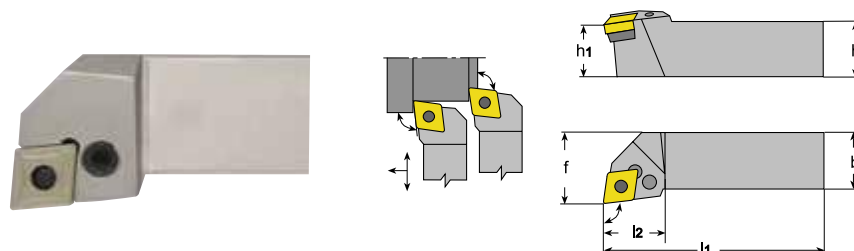
### Coolant discharge

The coolant discharge is targeted at the primary cutting edge, thus guaranteeing optimum cooling without the risk of a thermal shock effect.



## ATORN® Tool holders, negative PCLN

- **PCLN R/L 95°**
- Setting angle 95°, for negative 0° rhombic indexable inserts, 80° point angle
- **Use:** Longitudinal turning and facing



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand		Left-hand	
							A1	B1	C1	D1	E1	F1	art.no.	€	art.no.	€
PCLN..1616 H12	16	16	100	26	20	CN..1204..	A1	B5	C5	D1	E1	F1	320140 0001	76,30	320141 0001	76,30
PCLN..2020 K12	20	20	125	28	25	CN..1204..	A1	B1	C1	D1	E1	F1	320140 0002	76,30	320141 0002	76,30
PCLN..2525 M12	25	25	150	28	32	CN..1204..	A1	B1	C1	D1	E1	F1	320140 0003	84,-	320141 0003	84,-
PCLN..3225 P12	32	25	170	28	32	CN..1204..	A1	B1	C1	D1	E1	F1	320140 0004	99,20	320141 0004	99,20
PCLN..3232 P12	32	32	170	28	40	CN..1204..	A1	B1	C1	D1	E1	F1	320140 0005	118,50	320141 0005	118,50
PCLN..2525 M16	25	25	150	34	32	CN..1606..	A2	B2	C2	D2	E2	F1	320140 0006	87,50	320141 0006	87,50
PCLN..3225 P16	32	25	170	34	32	CN..1606..	A2	B2	C2	D2	E2	F1	320140 0007	99,20	320141 0007	99,20
PCLN..3232 P16	32	32	170	34	40	CN..1606..	A2	B2	C2	D2	E2	F1	320140 0008	118,50	320141 0008	118,50
PCLN..4040 S16	40	40	250	34	50	CN..1606..	A2	B2	C2	D2	E2	F1	320140 0009	164,50	320141 0009	164,50
PCLN..2525 M19	25	25	150	42	32	CN..1906..	A3	B3	C3	D3	E3	F2	320140 0010	87,50	320141 0010	87,50
PCLN..3225 P19	32	25	170	42	32	CN..1906..	A3	B3	C3	D3	E3	F2	320140 0011	99,20	320141 0011	99,20
PCLN..3232 P19	32	32	170	42	40	CN..1906..	A3	B3	C3	D3	E3	F2	320140 0012	120,50	320141 0012	120,50
PCLN..4040 S19	40	40	250	45	50	CN..1906..	A3	B3	C3	D3	E3	F2	320140 0013	164,50	320141 0013	164,50
PCLN..4040 S25	40	40	250	45	50	CN..2509..	A4	B4	C4	D4	E4	F3	320140 0014	164,50	320141 0014	164,50
PCLN..5050 T25	50	50	300	50	60	CN..2509..	A4	B4	C4	D4	E4	F3	320140 0015	260,-	320141 0015	260,-

3104

3104

### Spare parts

Support plate		Clamping lever		Screw		Hollow pin		Pin		Nickel-plated	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	321601 0007 9,05	B1	321601 0102 12,05	C1	321601 0202 3,49	D1	321601 0302 1,17	E1	321601 0402 1,33	F1	703005 0030 0,39
A2	321601 0008 13,65	B2	321601 0103 11,55	C2	321601 0203 3,27	D2	321601 0303 1,17	E2	321601 0403 1,33	F2	703005 0040 0,52
A3	321601 0009 21,30	B3	321601 0104 17,60	C3	321601 0204 3,27	D3	321601 0304 1,59	E3	321601 0404 1,33	F3	703005 0050 0,63
A4	321601 0032 62,10	B4	321601 0105 19,45	C4	321601 0205 4,63	D4	321601 0305 1,59	E4	321601 0405 2,18		
	3164		3106		3106		3106		3106		7111

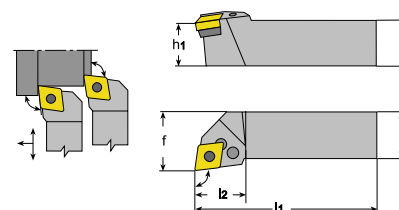


## ATORN® Clamp mounting, negative PCLN with internal cooling

NEW



- **PCLN R/L 95°**
- **Internal cooling connection 1/8"**
- Setting angle 95°, for negative 0° rhombic indexable inserts, 80° point angle
- **Material:** Longitudinal turning and facing



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						Right-hand art.no.	€	Left-hand art.no.	€
PCLN.. 1616 H12	16	16	100	26.1	20	CN.. 1204..	A1	B1	C1	D1	E1	320145 1616	131,50	320146 1616	131,50
PCLN.. 2020 K12	20	20	125	27.4	25	CN.. 1204..	A1	B1	C1	D1	E1	320145 2020	133,50	320146 2020	133,50
PCLN.. 2525 M12	25	25	150	28	32	CN.. 1204..	A1	B1	C1	D1	E1	320145 2525	139,50	320146 2525	139,50
												3164		3164	

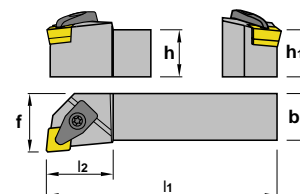
### Spare parts

	Clamping lever art.no.	€		Support plate art.no.	€		Screw art.no.	€		Hollow pin art.no.	€		Nickel-plated art.no.	€
A1	321601 0120	31,60	B1	321601 0124	18,95	C1	321601 0125	8,-	D1	321601 0126	4,83	E1	703005 0030	0,39
	3106			3164			3106			3106			7111	

## ATORN® DLOCK tool holder with D clamping, DCLN for negative turning inserts



- **DCLN R/L 95°**
- **With 1/8" GAS internal cooling connection**
- Setting angle 95°, for negative 0° rhombic indexable inserts, 80° point angle
- **Use:** Longitudinal turning and facing
- 1 x blind plug and 1 x connection nipple 1/8" included
- Fits hose set Art. No. 446312 0200 and 446312 0300



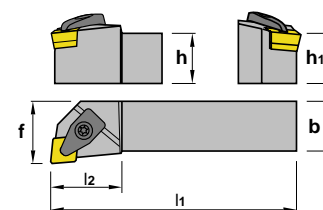
ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
DCLN.. 2020 K12 A	20	125	28	25	20	CN..12	A1	B1	C1	D1	E1	F1	324003 0001	205,-	324004 0001	205,-
DCLN.. 2525 M12 A	25	150	28	32	25	CN..12	A1	B1	C1	D1	E1	F1	324003 0003	221,-	324004 0003	221,-
DCLN.. 2525 M16 A	25	150	34	32	25	CN..16	A1	B2	C2	D1	E2	F1	324003 0004	221,-	324004 0004	221,-
DCLN.. 3232 P19 A	32	170	42	40	32	CN..19	A1	B3	C3	D1	E3	F1	324003 0005	305,-	324004 0005	305,-
													3104		3104	

### Spare parts

	Screw art.no.	€		Screw for spacer art.no.	€		Clamping claw art.no.	€		Spring art.no.	€		Spacer art.no.	€		Nickel-plated art.no.	€
A1	324020 0003	2,74	B1	324020 0004	3,94	C1	324020 0008	11,50	D1	324020 0012	0,80	E1	324020 0013	8,30	F1	703005 0040	0,52
			B2	324020 0005	5,10	C2	324020 0009	11,50				E2	324020 0014	8,30			
			B3	324020 0006	5,55	C3	324020 0010	11,95				E3	324020 0018	11,15			
	3106			3106			3106			3106			3106			7111	

## ATORN® DLOCK tool holder with D clamping, DCLN for negative turning inserts

- **DCLN R/L 95°**
- Setting angle 95°, for negative 0° rhombic indexable inserts, 80° point angle
- **Use:** Longitudinal turning and facing



ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts						Right-hand art.no.	€	Left-hand art.no.	€	
DCLN.. 2020 K12	20	125	28	25	20	CN..12	A1	B1	C1	D1	E1	F1	<b>324001</b> 0001	<b>86,50</b>	<b>324002</b> 0001	<b>86,50</b>
DCLN.. 2525 M12	25	150	28	25	25	CN..12	A1	B1	C1	D1	E1	F1	324001 0002	<b>93,60</b>	324002 0002	<b>93,60</b>
DCLN.. 2525 M16	25	150	34	32	25	CN..16	A1	B2	C2	D1	E2	F1	324001 0003	<b>107,50</b>	324002 0003	<b>107,50</b>
DCLN.. 3232 P19	32	170	42	40	32	CN..19	A1	B3	C3	D1	E3	F1	324001 0004	<b>154,-</b>	324002 0005	<b>154,-</b>
													3104		3104	

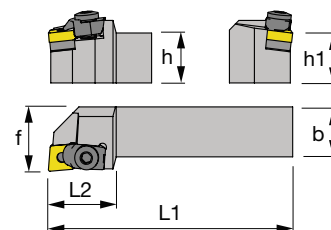
### Spare parts

	Screw art.no.	€		Screw for spacer art.no.	€		Clamping claw art.no.	€		Spring art.no.	€		Spacer art.no.	€		Nickel-plated art.no.	€
A1	324020 0003	<b>2,74</b>	B1	324020 0004	<b>3,94</b>	C1	324020 0008	<b>11,50</b>	D1	324020 0012	<b>0,80</b>	E1	324020 0013	<b>8,30</b>	F1	703005 0040	<b>0,52</b>
			B2	324020 0005	<b>5,10</b>	C2	324020 0009	<b>11,50</b>				E2	324020 0014	<b>8,30</b>			
			B3	324020 0006	<b>5,55</b>	C3	324020 0010	<b>11,95</b>				E3	324020 0018	<b>11,15</b>			
		3106			3106			3106			3106			3106			7111

## ATORN® MCLN tool holders, negative

**NEW**

- **MCLN R/L 95°**
- Setting angle 95°, for rhombic indexable inserts negative 0°, 80° point angle
- **Use:** Longitudinal turning and facing



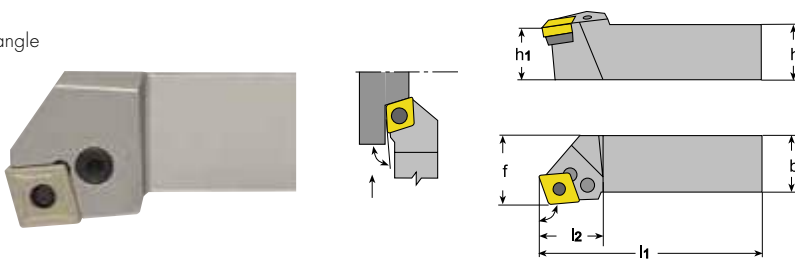
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						Right-hand art.no.	€	Left-hand art.no.	€	
MCLN.. 2020 K12	20	20	125	34	25	CN.. 1204..	A1	B1	C1	D1	E1	<b>320284</b> 0001	<b>79,40</b>	<b>320285</b> 0001	<b>79,40</b>	
MCLN.. 2525 M12	25	25	150	34	32	CN.. 1204..	A1	B1	C1	D1	E1	320284 0002	<b>86,-</b>	320285 0002	<b>86,-</b>	
													3104		3104	

### Spare parts

	Screw art.no.	€		Clamping claw art.no.	€		Support plate art.no.	€		Clamping pin art.no.	€		Nickel-plated art.no.	€
A1	321601 0024	<b>1,84</b>	B1	321601 0133	<b>15,40</b>	C1	321601 0134	<b>9,95</b>	D1	321601 0410	<b>3,49</b>	E1	703005 0050	<b>0,63</b>
		3106			3106			3164			3106			7111

## ATORN® Tool holders, negative PCKN

- **PCKN R/L 75°**
- Setting angle 75°, for negative 0° rhombic indexable inserts, 80° point angle
- **Use:** Facing



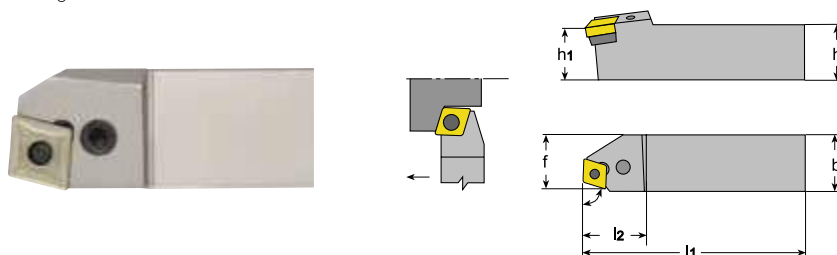
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand		Left-hand	
													art.no.	€	art.no.	€
PCKN..2020 K12	20	20	125	28	25	CN..1204..	A1	B1	C1	D1	E1	F1	<b>320135 0001</b>	88,-	<b>320136 0001</b>	88,-
PCKN..2525 M12	25	25	150	28	32	CN..1204..	A1	B1	C1	D1	E1	F1	320135 0002	94,60	320136 0002	94,60
PCKN..3225 P12	32	25	170	28	32	CN..1204..	A1	B1	C1	D1	E1	F1	320135 0003	99,70	320136 0003	99,70
PCKN..3232 P19	32	32	170	34	40	CN..1906..	A2	B2	C2	D2	E2	F2	320135 0004	142,50	320136 0004	142,50
PCKN..4040 S19	40	40	250	45	50	CN..1906..	A2	B2	C2	D2	E2	F2	320135 0005	170,50	320136 0005	170,50
PCKN..4040 S25	40	40	250	45	50	CN..2509..	A3	B3	C3	D3	E3	F3	320135 0006	170,50	320136 0006	170,50
													3104		3104	

### Spare parts

Support plate		Clamping lever		Screw		Hollow pin		Pin		Nickel-plated	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0007	9,05	B1 321601 0102	12,05	C1 321601 0202	3,49	D1 321601 0302	1,17	E1 321601 0402	1,33	F1 703005 0030	0,39
A2 321601 0009	21,30	B2 321601 0104	17,60	C2 321601 0204	3,27	D2 321601 0304	1,59	E2 321601 0404	1,33	F2 703005 0040	0,52
A3 321601 0032	62,10	B3 321601 0105	19,45	C3 321601 0205	4,63	D3 321601 0305	1,59	E3 321601 0405	2,18	F3 703005 0050	0,63
3164		3106		3106		3106		3106		7111	

## ATORN® Tool holders, negative PCBN

- **PCBN R/L 75°**
- Setting angle 75°, for negative 0° rhombic indexable inserts, 80° point angle
- **Use:** Longitudinal turning



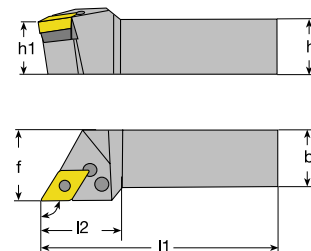
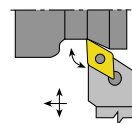
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand		Left-hand	
													art.no.	€	art.no.	€
PCBN..2525 M12	25	25	150	28	22	CN..1204..	A1	B1	C1	D1	E1	F1	<b>320150 0002</b>	93,60	<b>320151 0002</b>	93,60
PCBN..2525 M16	25	25	150	34	22	CN..1606..	A2	B2	C2	D2	E2	F1	320150 0003	105,-	320151 0003	105,-
PCBN..3232 P19	32	32	170	42	27	CN..1906..	A3	B3	C3	D3	E3	F2	320150 0007	141,-	320151 0007	141,-
PCBN..4040 S25	40	40	250	48	41	CN..2509..	A4	B4	C4	D4	E4	F3	320150 0008	164,50	320151 0008	164,50
													3104		3104	

### Spare parts

Support plate		Clamping lever		Screw		Hollow pin		Pin		Nickel-plated	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0007	9,05	B1 321601 0102	12,05	C1 321601 0202	3,49	D1 321601 0302	1,17	E1 321601 0402	1,33	F1 703005 0030	0,39
A2 321601 0008	13,65	B2 321601 0103	11,55	C2 321601 0203	3,27	D2 321601 0303	1,17	E2 321601 0403	1,33	F2 703005 0040	0,52
A3 321601 0009	21,30	B3 321601 0104	17,60	C3 321601 0204	3,27	D3 321601 0304	1,59	E3 321601 0404	1,33	F3 703005 0050	0,63
A4 321601 0032	62,10	B4 321601 0105	19,45	C4 321601 0205	4,63	D4 321601 0305	1,59	E4 321601 0405	2,18		
3164		3106		3106		3106		3106		7111	

## ATORN® PDJN tool holders, negative

- **PDJN R/L 93°**
- Setting angle 93°, for negative 0° rhombic indexable inserts, 55° point angle
- **Use:** Copy turning



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
PDJN..1616 H11	16	16	100	28	20	DN..1104..	A2	B1	C1	D1	E1	F1	320155 0010	93,60	320156 0010	93,60
PDJN..2020 K11	20	20	125	28	25	DN..1104..	A2	B1	C1	D1	E1	F1	320155 0011	93,60	320156 0011	93,60
PDJN..2525 M11	25	25	150	28	32	DN..1104..	A2	B1	C1	D1	E1	F1	320155 0012	97,20	320156 0012	97,20
PDJN..2020 K15	20	20	125	34	25	DN..1506..	A1	B2	C2	D2	E2	F2	320155 0001	93,60	320156 0001	93,60
PDJN..2525 M15	25	25	150	34	32	DN..1506..	A1	B2	C2	D2	E2	F2	320155 0002	99,70	320156 0002	99,70
PDJN..3225 P15	32	25	170	34	32	DN..1506..	A1	B2	C2	D2	E2	F2	320155 0003	99,70	320156 0003	99,70
PDJN..3232 P15	32	32	170	34	40	DN..1506..	A1	B2	C2	D2	E2	F2	320155 0004	118,50	320156 0004	118,50
													3104		3104	

### Spare parts

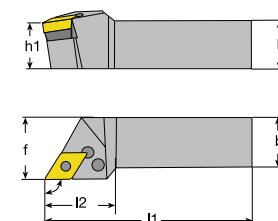
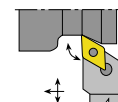
	Support plate		Clamping lever		Screw		Hollow pin		Pin		Nickel-plated						
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€						
A1	321601 0010	8,80	B1	321601 0101	11,55	C1	321601 0201	3,49	D1	321601 0301	0,91	E1	321601 0401	1,33	F1	703005 0025	0,39
A2	321601 0012	15,50	B2	321601 0107	12,95	C2	321601 0206	3,27	D2	321601 0302	1,17	E2	321601 0402	1,33	F2	703005 0030	0,39
		3164			3106			3106				3106					7111

## ATORN® Clamp mounting, negative PDJN with internal cooling

NEW



- **PDJN R/L 93°**
- **Internal cooling connection 1/8"**
- Setting angle 93°, for negative 0° rhombic indexable inserts, 55° point angle
- **Material:** Copy turning



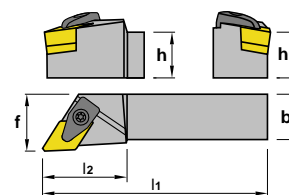
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
PDJN.. 2020 K15	20	20	125	34	25	DN.. 1506..	A1	B1	C1	D1	E1	E1	320161 2020	133,50	320162 2020	133,50
PDJN.. 2525 M15	25	25	150	42	40	DN.. 1506..	A1	B1	C1	D1	E1	E1	320161 2525	139,50	320162 2525	139,50
													3164		3164	

### Spare parts

	Clamping lever		Screw		Hollow pin		Support plate		Nickel-plated						
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€						
A1	321601 0122	33,10	B1	321601 0125	8,-	C1	321601 0126	4,83	D1	321601 0129	20,60	E1	703005 0030	0,39	
		3106			3106			3106				3164			7111

**ATORN® DLOCK tool holder with D clamping, DDJN for negative turning inserts**

- **DDJN R/L 93°**
- **With 1/8" GAS internal cooling connection**
- Setting angle 93°, for rhombic indexable inserts negative 0°, 55° point angle
- **Use:** Copy turning
- 1 x blind plug and 1 x connection nipple 1/8" included
- Fits hose set Art. No. 446312 0200 and 446312 0300



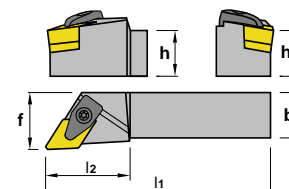
ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts							Right-hand		Left-hand	
													art.no.	€	art.no.	€
DDJN.. 2020 K11 A	20	125	28	25	20	DN..11	A1	B1	C1	D1	E1	F1	<b>324007</b> 0001	<b>205,-</b>	<b>324008</b> 0001	<b>205,-</b>
DDJN.. 2020 K15 A	20	125	34	25	20	DN..15	A2	B2	C2	D2	E2	F1	324007 0002	205,-	324008 0002	205,-
DDJN.. 2525 M15 A	32	150	42	40	25	DN..15	A2	B2	C2	D2	E2	F1	324007 0003	221,-	324008 0003	221,-
													3104		3104	

**Spare parts**

<b>Screw for spacer</b>		<b>Screw</b>		<b>Clamping claw</b>		<b>Spring</b>		<b>Spacer</b>		<b>Nickel-plated</b>	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 324020 0001	<b>3,94</b>	B1 324020 0002	<b>2,74</b>	C1 324020 0007	<b>11,50</b>	D1 324020 0011	<b>0,90</b>	E1 324020 0015	<b>8,30</b>	F1 703005 0040	<b>0,52</b>
A2 324020 0004	<b>3,94</b>	B2 324020 0003	<b>2,74</b>	C2 324020 0008	<b>11,50</b>	D2 324020 0012	<b>0,80</b>	E2 324020 0016	<b>8,30</b>		
3106		3106		3106		3106		3106		7111	

**ATORN® DLOCK tool holder with D clamping, DDJN for negative turning inserts**

- **DDJN R/L 93°**
- Setting angle 93°, for negative 0° rhombic indexable inserts, 55° point angle
- **Use:** Copy turning



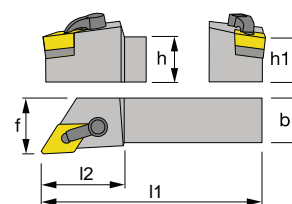
ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts							Right-hand		Left-hand	
													art.no.	€	art.no.	€
DDJN.. 2020 K11	20	125	34	25	20	DN..11	A1	B1	C1	D1	E1	F1	<b>324005</b> 0001	<b>97,20</b>	<b>324006</b> 0001	<b>97,20</b>
DDJN.. 2020 K15	20	125	34	25	20	DN..15	A2	B2	C2	D2	E2	F1	324005 0002	97,20	324006 0002	97,20
DDJN.. 2525 M15	25	150	34	32	25	DN..15	A2	B2	C2	D2	E2	F1	324005 0003	105,50	324006 0003	105,50
													3104		3104	

**Spare parts**

<b>Screw for spacer</b>		<b>Screw</b>		<b>Clamping claw</b>		<b>Spring</b>		<b>Spacer</b>		<b>Nickel-plated</b>	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 324020 0001	<b>3,94</b>	B1 324020 0002	<b>2,74</b>	C1 324020 0007	<b>11,50</b>	D1 324020 0011	<b>0,90</b>	E1 324020 0015	<b>8,30</b>	F1 703005 0040	<b>0,52</b>
A2 324020 0004	<b>3,94</b>	B2 324020 0003	<b>2,74</b>	C2 324020 0008	<b>11,50</b>	D2 324020 0012	<b>0,80</b>	E2 324020 0016	<b>8,30</b>		
3106		3106		3106		3106		3106		7111	

## ATORN® MDJN tool holders, negative

- **MDJN R/L 93°**
- Setting angle 93°, for rhombic indexable inserts negative 0°, 55° point angle
- **Use:** Copy turning



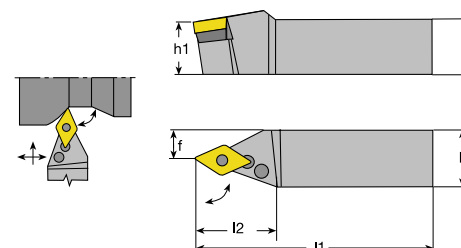
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						Right-hand art.no.	€	Left-hand art.no.	€
MDJN.. 2020 K15	20	20	125	42	25	DN..1506..	A1	B1	C1	D1	E2	320286 0001	79,40	320287 0001	79,40
MDJN.. 2525 M15	25	25	150	42	32	DN..1506..	A1	B1	C1	D1	E2	320286 0002	86,-	320287 0002	86,-
												3104		3104	

### Spare parts

	Clamping lever art.no.	€		Clamping pin art.no.	€		Screw art.no.	€		Spacer art.no.	€		Nickel-plated art.no.	€
A1	321601 0118	13,40	B1	321601 0135	9,55	C1	321601 0212	3,97	D1	324020 0016	8,30	E1	703005 0025	0,39
												E2	703005 0030	0,39
	3106			3106			3106			3106			7111	

## ATORN® Tool holders, negative PDNNN

- **PDNNN 63°**
- Setting angle 63°, for negative 0° rhombic indexable inserts, 55° point angle
- **Use:** Longitudinal and copy turning



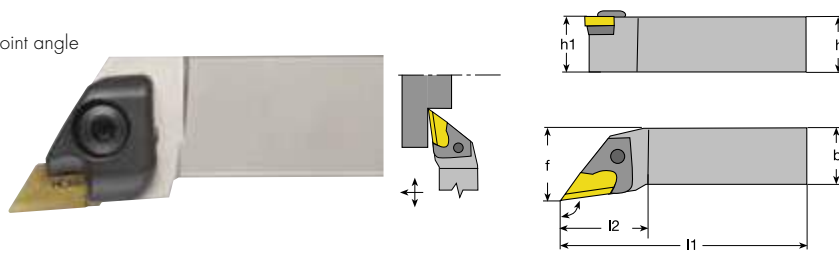
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							neutral art.no.	€
PDNNN 2020 K15	20	20	125	34	10	DN..1506..	A1	B1	C1	D1	E1	F1	320160 0001	95,60
PDNNN 2525 M15	25	25	150	34	12.5	DN..1506..	A1	B1	C1	D1	E1	F1	320160 0002	99,70
PDNNN 3232 P15	32	32	170	34	16	DN..1506..	A1	B1	C1	D1	E1	F1	320160 0004	118,50
PDNNN 4025 S15	40	25	250	34	12.5	DN..1506..	A1	B1	C1	D1	E1	F1	320160 0006	164,50
PDNNN 5032 S15	50	32	250	34	16	DN..1506..	A1	B1	C1	D1	E1	F1	320160 0007	255,-
													3104	

### Spare parts

	Support plate art.no.	€		Clamping lever art.no.	€		Screw art.no.	€		Hollow pin art.no.	€		Pin art.no.	€		Nickel-plated art.no.	€
A1	321601 0010	8,80	B1	321601 0107	12,95	C1	321601 0206	3,27	D1	321601 0302	1,17	E1	321601 0402	1,33	F1	703005 0030	0,39
	3164			3106			3106			3106			3106			7111	

## ATORN® Tool holders, negative CKJN

- **CKJN R/L 93°**
- Setting angle 93°, for negative 0° KNUX indexable inserts, 55° point angle
- **Use:** Longitudinal and copy turning



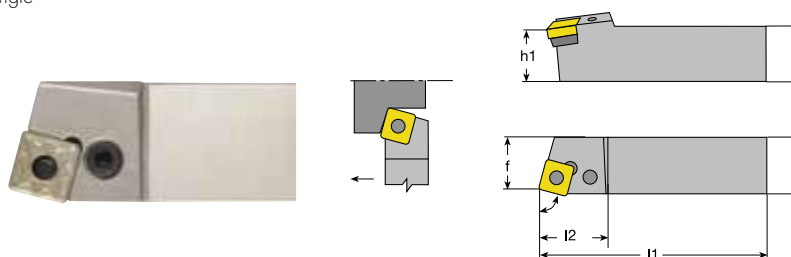
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts								Right-hand art.no.	€	Left-hand art.no.	€
CKJNR 2020 K16	20	20	125	34	30	KNUX1604..	A1	B1	C1	D1	E1	F1	G1	<b>320179 0001</b>	<b>102,-</b>		
CKJNL 2020 K16	20	20	125	34	30	KNUX1604..	A2	B2	C1	D1	E1	F1	G1			<b>320181 0001</b>	<b>102,-</b>
CKJNR 2525 M16	25	25	150	34	32	KNUX1604..	A1	B1	C1	D1	E1	F2	G1	320179 0002	113,-		
CKJNL 2525 M16	25	25	150	34	32	KNUX1604..	A2	B2	C1	D1	E1	F2	G1			320181 0002	113,-
CKJNR 3225 P16	32	25	170	34	32	KNUX1604..	A1	B1	C1	D1	E1	F2	G1	320179 0003	118,50		
CKJNL 3225 P16	32	25	170	34	32	KNUX1604..	A2	B2	C1	D1	E1	F2	G1			320181 0003	118,50
CKJNR 3232 P16	32	32	170	34	40	KNUX1604..	A1	B1	C1	D1	E1	F2	G1	320179 0004	118,50		
CKJNL 3232 P16	32	32	170	34	40	KNUX1604..	A2	B2	C1	D1	E1	F2	G1			320181 0004	118,50
														3104		3104	

### Spare parts

	<b>Support plate</b>		<b>Clamping lever</b>		<b>Screw</b>		<b>Pin</b>		<b>Spring</b>		<b>Spring pin</b>		<b>Nickel-plated</b>							
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€							
A1	321601 0018	11,80	B1	321601 0114	13,90	C1	321601 0215	3,49	D1	321601 0408	1,40	E1	321601 0901	1,33	F1	321601 0902	3,03	G1	703005 0040	0,52
A2	321601 0019	11,80	B2	321601 0115	13,90					F2	321601 0903	3,03								
3106		3106		3164		3106		3106		3106		7111								

## ATORN® Tool holders, negative PSBN

- **PSBN R/L 75°**
- Setting angle 75°, for negative 0° square indexable inserts, 90° point angle
- **Use:** Longitudinal turning



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts								Right-hand art.no.	€	Left-hand art.no.	€
PSBN..2020 K12	20	20	125	28	17	SN..1204..	A1	B1	C1	D1	E1	F1	G1	<b>320115 0001</b>	<b>77,30</b>	<b>320116 0001</b>	<b>77,30</b>
PSBN..2525 M12	25	25	150	28	22	SN..1204..	A1	B1	C1	D1	E1	F1	G1	320115 0002	82,40	320116 0002	82,40
PSBN..3225 P12	32	25	170	28	22	SN..1204..	A1	B1	C1	D1	E1	F1	G1	320115 0003	89,50	320116 0003	89,50
PSBN..3232 P19	32	32	170	42	27	SN..1906..	A2	B2	C2	D2	E2	F2	G2	320115 0006	118,50	320116 0006	118,50
PSBN..4040 S25	40	40	250	45	35	SN..2507..	A3	B3	C3	D3	E3	F3	G3	320115 0008	164,50	320116 0008	164,50
														3104		3104	

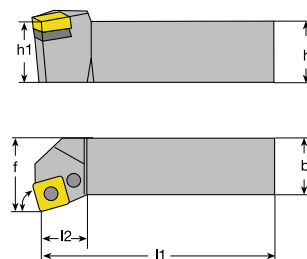
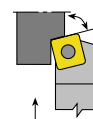
### Spare parts

	<b>Support plate</b>		<b>Clamping lever</b>		<b>Screw</b>		<b>Hollow pin</b>		<b>Pin</b>		<b>Spring pin</b>		<b>Nickel-plated</b>				
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€				
A1	321601 0003	9,25	B1	321601 0102	12,05	C1	321601 0202	3,49	D1	321601 0302	1,17	E1	321601 0402	1,33	F1	703005 0030	0,39
A2	321601 0005	17,40	B2	321601 0104	17,60	C2	321601 0204	3,27	D2	321601 0304	1,59	E2	321601 0404	1,33	F2	703005 0040	0,52
A3	321601 0006	41,20	B3	321601 0105	19,45	C3	321601 0205	4,63	D3	321601 0305	1,59	E3	321601 0405	2,18	F3	703005 0050	0,63
3106		3106		3106		3106		3106		3106		7111					



## ATORN® Tool holders, negative PSKN

- **PSKN R/L 75°**
- Setting angle 75°, for negative 0° square indexable inserts, 90° point angle
- **Use:** Facing



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand art.no.	€
PSKN..2020 K12	20	20	125	28	25	SN..1204..	A1	B1	C1	D1	E1	F1	<b>320120 0001</b>	<b>77,30</b>
PSKN..2525 M12	25	25	150	28	32	SN..1204..	A1	B1	C1	D1	E1	F1	320120 0002	<b>82,40</b>
PSKN..3225 P12	32	25	170	28	32	SN..1204..	A1	B1	C1	D1	E1	F1	320120 0003	<b>89,50</b>
PSKN..3232 P19	32	32	170	42	40	SN..1906..	A2	B2	C2	D2	E2	F2	320120 0006	<b>118,50</b>

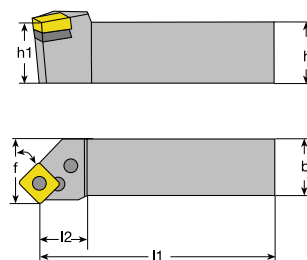
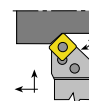
3104

### Spare parts

<b>Support plate</b>		<b>Clamping lever</b>		<b>Screw</b>		<b>Hollow pin</b>		<b>Pin</b>		<b>Nickel-plated</b>	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0003	<b>9,25</b>	B1 321601 0102	<b>12,05</b>	C1 321601 0202	<b>3,49</b>	D1 321601 0302	<b>1,17</b>	E1 321601 0402	<b>1,33</b>	F1 703005 0030	<b>0,39</b>
A2 321601 0005	<b>17,40</b>	B2 321601 0104	<b>17,60</b>	C2 321601 0204	<b>3,27</b>	D2 321601 0304	<b>1,59</b>	E2 321601 0404	<b>1,33</b>	F2 703005 0040	<b>0,52</b>
3106		3106		3106		3106		3106		7111	

## ATORN® Tool holders, negative PSSN

- **PSSN R/L 45°**
- Setting angle 45°, for negative 0° square indexable inserts, 90° point angle
- **Use:** Longitudinal turning and facing



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
PSSN..2020 K12	20	20	125	28	25	SN..1204..	A1	B1	C1	D1	E1	F1	<b>320125 0001</b>	<b>77,30</b>	<b>320126 0001</b>	<b>77,30</b>
PSSN..2525 M12	25	25	150	28	32	SN..1204..	A1	B1	C1	D1	E1	F1	320125 0002	<b>86,-</b>	320126 0002	<b>86,-</b>
PSSN..3232 P19	32	32	170	42	40	SN..1906..	A2	B2	C2	D2	E2	F2	320125 0006	<b>118,50</b>	320126 0006	<b>118,50</b>

3104

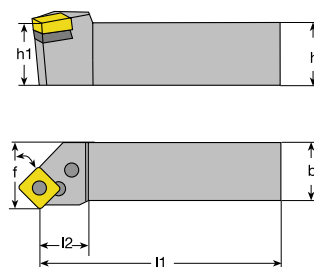
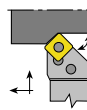
3104

### Spare parts

<b>Support plate</b>		<b>Clamping lever</b>		<b>Screw</b>		<b>Hollow pin</b>		<b>Pin</b>		<b>Nickel-plated</b>	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0003	<b>9,25</b>	B1 321601 0102	<b>12,05</b>	C1 321601 0202	<b>3,49</b>	D1 321601 0302	<b>1,17</b>	E1 321601 0402	<b>1,33</b>	F1 703005 0030	<b>0,39</b>
A2 321601 0005	<b>17,40</b>	B2 321601 0104	<b>17,60</b>	C2 321601 0204	<b>3,27</b>	D2 321601 0304	<b>1,59</b>	E2 321601 0404	<b>1,33</b>	F2 703005 0040	<b>0,52</b>
3106		3106		3106		3106		3106		7111	

**ATORN® Clamp mounting, negative PSSN with internal cooling****NEW**

- **PSSN R/L 45°**
- **connection for internal cooling 1/8"**
- Setting angle 45°, for square indexable inserts negative 0°, 90° point angle
- **Use:** Longitudinal turning and facing



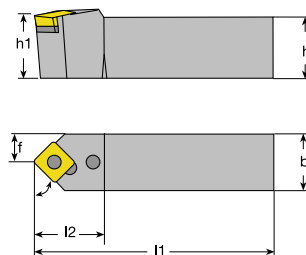
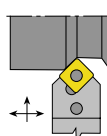
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						Right-hand		Left-hand	
												art.no.	€	art.no.	€
PSSN. 2020 K12	20	20	125	29.4	25	SNM. 1204..	A1	B1	C1	D1	E1	<b>320127</b> 2020	<b>186,50</b>	<b>320128</b> 2020	<b>186,50</b>
PSSN. 2525 M12	25	25	150	29.3	32	SNM. 1204..	A1	B1	C1	D1	E1	320127 2525	<b>198,50</b>	320128 2525	<b>198,50</b>
												3162		3162	

**Spare parts**

<b>Clamping lever</b>		<b>Screw</b>		<b>Hollow pin</b>		<b>Support plate</b>		<b>Nickel-plated</b>	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0120	<b>31,60</b>	B1 321601 0125	<b>8,-</b>	C1 321601 0126	<b>4,83</b>	D1 321601 0131	<b>15,90</b>	E1 703005 0030	<b>0,39</b>
3106		3106		3106		3106		7111	

**ATORN® Tool holders, negative PSDNN**

- **PSDNN 45°**
- Setting angle 45°, for negative 0° square indexable inserts, 90° point angle
- **Use:** Longitudinal turning and chamfering



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							neutral	
													art.no.	€
PSDNN 2020 K12	20	20	125	28	10	SN..1204..	A1	B1	C1	D1	E1	F1	<b>320130</b> 0001	<b>88,50</b>
PSDNN 2525 M12	25	25	150	28	12.5	SN..1204..	A1	B1	C1	D1	E1	F1	320130 0002	<b>93,60</b>
PSDNN 3232 P12	32	32	170	28	16	SN..1204..	A1	B1	C1	D1	E1	F1	320130 0003	<b>118,50</b>
													3104	

**Spare parts**

<b>Support plate</b>		<b>Clamping lever</b>		<b>Screw</b>		<b>Hollow pin</b>		<b>Pin</b>		<b>Nickel-plated</b>	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0003	<b>9,25</b>	B1 321601 0102	<b>12,05</b>	C1 321601 0202	<b>3,49</b>	D1 321601 0302	<b>1,17</b>	E1 321601 0402	<b>1,33</b>	F1 703005 0030	<b>0,39</b>
3106		3106		3106		3106		3106		7111	



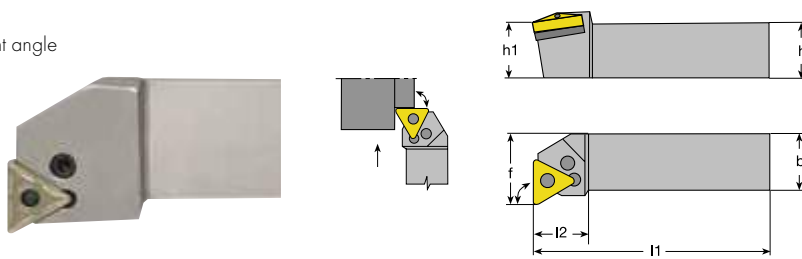
Ground sharp ...

... optimal chip control.

**ATORN®**  
 Performance demands quality

## ATORN® Tool holders, negative PTFN

- PTFN R/L 90°
- Setting angle 90°, for negative 0° triangular indexable inserts, 60° point angle
- Use: Facing



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
PTFN..1616 H16	16	16	100	22	20	TN..1604..	A1	B1	C1	D1	E1	F1	320105 0001	80,90	320106 0001	80,90
PTFN..2020 K16	20	20	125	22	25	TN..1604..	A1	B1	C1	D1	E1	F1	320105 0002	88,50	320106 0002	88,50
PTFN..2525 M16	25	25	150	22	32	TN..1604..	A1	B1	C1	D1	E1	F1	320105 0003	93,60	320106 0003	93,60
PTFN..2525 M22	25	25	150	28	32	TN..2204..	A2	B2	C2	D2	E2	F2	320105 0004	105,50	320106 0004	105,50
PTFN..3232 P22	32	32	170	28	40	TN..2204..	A2	B2	C2	D2	E2	F2	320105 0005	140,-	320106 0005	140,-

3104

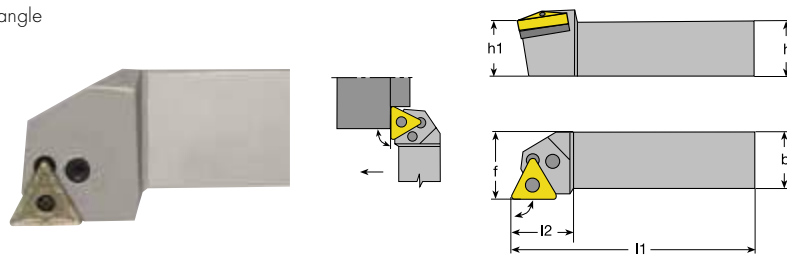
3104

### Spare parts

	Support plate		Clamping lever		Screw		Hollow pin		Pin		Nickel-plated						
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€						
A1	321601 0001	7,90	B1	321601 0101	11,55	C1	321601 0201	3,49	D1	321601 0301	0,91	E1	321601 0401	1,33	F1	703005 0025	0,39
A2	321601 0002	10,70	B2	321601 0102	12,05	C2	321601 0202	3,49	D2	321601 0302	1,17	E2	321601 0402	1,33	F2	703005 0030	0,39
3164		3106		3106		3106		3106		7111							

## ATORN® Tool holders, negative PTGN

- PTGN R/L 90°
- Setting angle 90°, for negative 0° triangular indexable inserts, 60° point angle
- Use: Longitudinal turning



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
PTGN..1616 H16	16	16	100	22	20	TN..1604..	A1	B1	C1	D1	E1	F1	320101 0001	80,90	320102 0001	80,90
PTGN..2020 K16	20	20	125	22	25	TN..1604..	A1	B1	C1	D1	E1	F1	320101 0002	88,50	320102 0002	88,50
PTGN..2525 M16	25	25	150	22	32	TN..1604..	A1	B1	C1	D1	E1	F1	320101 0003	93,60	320102 0003	93,60
PTGN..2525 M22	25	25	150	28	32	TN..2204..	A2	B2	C2	D2	E2	F2	320101 0005	93,60	320102 0005	93,60
PTGN..3232 P22	32	32	170	28	40	TN..2204..	A2	B2	C2	D2	E2	F2	320101 0007	100,50	320102 0007	100,50

3104

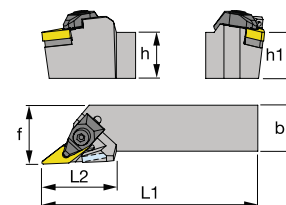
3104

### Spare parts

	Support plate		Clamping lever		Screw		Hollow pin		Pin		Nickel-plated						
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€						
A1	321601 0001	7,90	B1	321601 0101	11,55	C1	321601 0201	3,49	D1	321601 0301	0,91	E1	321601 0401	1,33	F1	703005 0025	0,39
A2	321601 0002	10,70	B2	321601 0102	12,05	C2	321601 0202	3,49	D2	321601 0302	1,17	E2	321601 0402	1,33	F2	703005 0030	0,39
3164		3106		3106		3106		3106		7111							

**ATORN® DLOCK clamp mounting with D-clamp DVJN for negative turning inserts****NEW**

- **DVJN R/L 93°**
- **connection for internal cooling 1/8" GAS**
- Setting angle 93°, for rhombic indexable inserts negative 0°, 35° point angle
- **Use:** Copy turning
- suitable hose set art. no 446312 0200 and 446312 0300



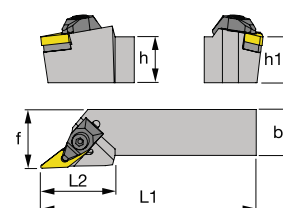
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand art.no. €		Left-hand art.no. €	
DVJN.. 2020 K16-A	20	20	125	44	25	VN.. 1604..	A1	B1	C1	D1	E1	F1	<b>320280 0001</b>	<b>209,-</b>	<b>320281 0001</b>	<b>209,-</b>
DVJN.. 2525 M16-A	25	25	150	44	32	VN.. 1604..	A1	B1	C1	D1	E1	F1	<b>320280 0002</b>	<b>219,-</b>	<b>320281 0002</b>	<b>219,-</b>
													3104		3104	

**Spare parts**

<b>Screw for spacer</b>		<b>Screw</b>		<b>Clamping claw</b>		<b>Spring</b>		<b>Spacer</b>		<b>Nickel-plated</b>	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 324020 0001	<b>3,94</b>	B1 324020 0002	<b>2,74</b>	C1 324020 0007	<b>11,50</b>	D1 324020 0011	<b>0,90</b>	E1 324020 0020	<b>9,30</b>	F1 703005 0040	<b>0,52</b>
3106		3106		3106		3106		3106		7111	

**ATORN® DLOCK clamp mounting with D-clamp DVJN for negative turning inserts****NEW**

- **DVJN R/L 93°**
- Setting angle 93°, for rhombic indexable inserts negative 0°, 35° point angle
- **Use:** Copy turning



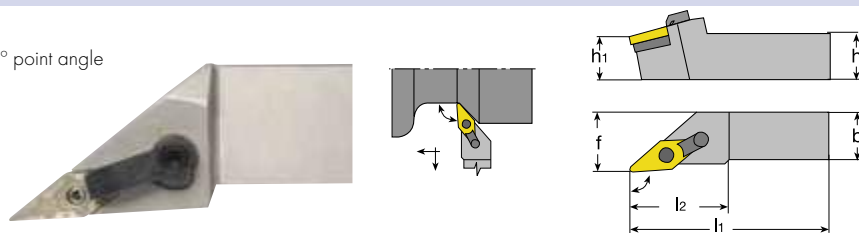
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts							Right-hand art.no. €		Left-hand art.no. €	
DVJN.. 2020 K16	20	20	125	44	25	VN.. 1604..	A1	B1	C1	D1	E1	F1	<b>320282 0001</b>	<b>110,-</b>	<b>320283 0001</b>	<b>110,-</b>
DVJN.. 2525 M16	25	25	150	44	32	VN.. 1604..	A1	B1	C1	D1	E1	F1	<b>320282 0002</b>	<b>116,50</b>	<b>320283 0002</b>	<b>116,50</b>
													3104		3104	

**Spare parts**

<b>Screw for spacer</b>		<b>Screw</b>		<b>Clamping claw</b>		<b>Spring</b>		<b>Spacer</b>		<b>Nickel-plated</b>	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 324020 0001	<b>3,94</b>	B1 324020 0002	<b>2,74</b>	C1 324020 0007	<b>11,50</b>	D1 324020 0011	<b>0,90</b>	E1 324020 0020	<b>9,30</b>	F1 703005 0040	<b>0,52</b>
3106		3106		3106		3106		3106		7111	

## ATORN® Tool holders, negative MVJN

- **MVJN R/L 93°**
- Setting angle 93°, for negative 0° rhombic indexable inserts, 35° point angle
- **Use:** Longitudinal turning and facing



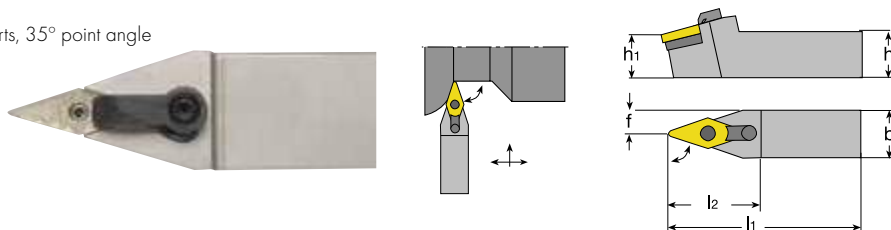
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						Right-hand art.no.	€	Left-hand art.no.	€
MVJN..2020 K16	20	20	125	37	25	VN..1604..	A1	B1	C1	D1	E1	320175 0020	106,-	320176 0020	106,-
MVJN..2525 M16	25	25	150	37	32	VN..1604..	A1	B1	C1	D1	E1	320175 0025	114,-	320176 0025	114,-
MVJN..3225 P16	32	25	170	37	32	VN..1604..	A1	B1	C1	D1	E1	320175 0032	142,-	320176 0032	142,-
												3104		3104	

### Spare parts

	Spacer art.no.	€		Clamping claw art.no.	€		Screw art.no.	€		Clamping pin art.no.	€		Nickel-plated art.no.	€
A1	321601 0017	15,50	B1	321601 0111	13,40	C1	321601 0212	3,97	D1	321601 0407	11,35	E1	703005 0030	0,39
		3164			3106			3106			3106			7111

## ATORN® Tool holders, negative MVVNN

- **MVVNN 72.5°**
- Setting angle 72.5°, for negative 0° rhombic indexable inserts, 35° point angle
- **Use:** Longitudinal and copy turning



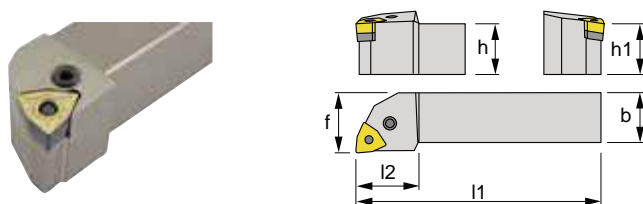
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						neutral art.no.	€
MVVNN 2020 K16	20	20	125	43	10	VN..1604..	A1	B1	C1	D1	E1	320177 0001	106,-
MVVNN 2525 M16	25	25	150	43	12.5	VN..1604..	A1	B1	C1	D1	E1	320177 0002	114,-
												3104	

### Spare parts

	Spacer art.no.	€		Clamping claw art.no.	€		Screw art.no.	€		Clamping pin art.no.	€		Nickel-plated art.no.	€
A1	321601 0017	15,50	B1	321601 0111	13,40	C1	321601 0212	3,97	D1	321601 0407	11,35	E1	703005 0030	0,39
		3164			3106			3106			3106			7111

## ATORN® Clamp mounting, negative PWLN

- **PWLN R/L 95°**
- Setting angle 95°, for trigometric indexable inserts negative 0°, 80° point angle
- **Material:** Longitudinal turning and facing



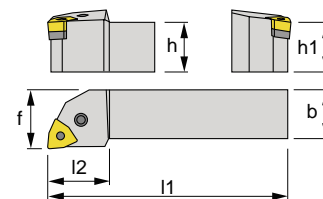
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						Right-hand art.no.	€	Left-hand art.no.	€	
PWLN. 1616 H06	16	16	100	22	20	WNM..0604..	A2	B2	C1	D1	E1	F1	320172 1606	88,50	320173 1606	88,50
PWLN. 2020 K06	20	20	125	25	25	WNM..0604..	A2	B2	C1	D1	E1	F1	320172 2006	88,50	320173 2006	88,50
PWLN. 2525 M06	25	25	150	25	32	WNM..0604..	A2	B2	C1	D1	E1	F1	320172 2506	92,60	320173 2506	92,60
PWLN. 2020 K08	20	20	125	28	25	WNM..0804..	A1	B1	C2	D2	E2	F2	320172 2008	88,50	320173 2008	88,50
PWLN. 2525 M08	25	25	150	28	32	WNM..0804..	A1	B1	C2	D2	E2	F2	320172 2508	92,60	320173 2508	92,60
PWLN. 3232 P08	32	32	170	34	40	WNM..0804..	A1	B1	C2	D2	E2	F2	320172 3208	118,50	320173 3208	118,50
												3104		3104		

### Spare parts

	Support plate art.no.	€		Clamping lever art.no.	€		Screw art.no.	€		Hollow pin art.no.	€		Pin art.no.	€		Nickel-plated art.no.	€
A1	321601 0016	9,70	B1	321601 0102	12,05	C1	321601 0201	3,49	D1	321601 0301	0,91	E1	321601 0401	1,33	F1	703005 0025	0,39
A2	321601 0031	9,95	B2	321601 0119	11,55	C2	321601 0202	3,49	D2	321601 0302	1,17	E2	321601 0402	1,33	F2	703005 0030	0,39
		3164			3106			3106			3106			3106			7111

**ATORN® Clamp mounting, negative PWLN with internal cooling****NEW**

- **PWLN R/L 95°**
- **Internal cooling connection 1/8"**
- Setting angle 95°, for negative 0° trigonometric indexable inserts, 80° point angle
- **Material:** Longitudinal turning and facing



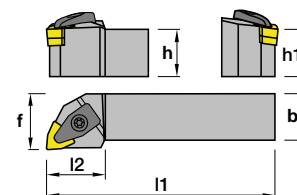
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						Right-hand		Left-hand			
												art.no.	€	art.no.	€		
PWLN.. 2020 K08	20	20	125	28	25	WN.. 0804..	A1	B1	C1	D1	E1	<b>320133</b>	2008	<b>133,50</b>	<b>320134</b>	2008	<b>133,50</b>
PWLN.. 2525 M08	25	25	150	28	32	WN.. 0804..	A1	B1	C1	D1	E1	320133	2508	<b>139,50</b>	320134	2508	<b>139,50</b>
												3164			3164		

**Spare parts**

Clamping lever		Screw		Hollow pin		Support plate		Nickel-plated						
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€					
A1	321601 0120	31,60	B1	321601 0125	8,-	C1	321601 0126	4,83	D1	321601 0132	20,60	E1	703005 0030	0,39
	3106		3106				3106			3164			7111	

**ATORN® DLOCK tool holder with D clamping, DWLN for negative turning inserts**

- **DWLN R/L 95°**
- **With 1/8" GAS internal cooling connection**
- Setting angle 95°, for negative 0° trigonometric indexable inserts, 80° point angle
- **Use:** Longitudinal turning and facing
- 1 x blind plug and 1 x connection nipple 1/8" included
- Fits hose set Art. No. 446312 0200 and 446312 0300



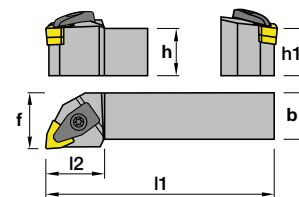
ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts							Right-hand		Left-hand			
													art.no.	€	art.no.	€		
DWLN.. 2020 K06 A	20	125	34	25	20	WN..06	A1	B1	C1	D1	E1	F1	<b>324011</b>	0001	<b>205,-</b>	<b>324012</b>	0001	<b>205,-</b>
DWLN.. 2020 K08 A	20	125	34	25	20	WN..08	A2	B2	C2	D2	E2	F1	324011	0002	<b>205,-</b>	324012	0002	<b>205,-</b>
DWLN.. 2525 M08 A	25	150	34	32	25	WN..08	A2	B2	C2	D2	E2	F1	324011	0003	<b>221,-</b>	324012	0003	<b>323,-</b>
													3104			3104		

**Spare parts**

Screw for spacer		Screw		Clamping claw		Spring		Spacer		Nickel-plated							
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€						
A1	324020 0001	3,94	B1	324020 0002	2,74	C1	324020 0007	11,50	D1	324020 0011	0,90	E1	324020 0021	5,85	F1	703005 0040	0,52
A2	324020 0004	3,94	B2	324020 0003	2,74	C2	324020 0008	11,50	D2	324020 0012	0,80	E2	324020 0022	5,55			
	3106		3106				3106			3106			7111				

## ATORN® DLOCK tool holder with D clamping, DWLN for negative turning inserts

- **DWLN R/L 95°**
- Setting angle 95°, for negative 0° trigonometric indexable inserts, 80° point angle
- **Use:** Longitudinal turning and facing



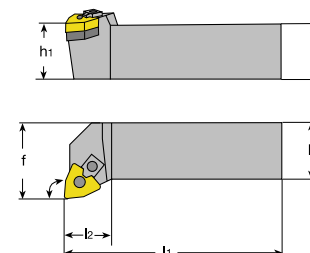
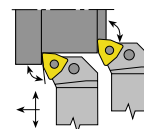
ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts					Right-hand		Left-hand			
											art.no.	€	art.no.	€		
DWLN..2020 K06	20	125	34	25	20	WN..06	A1	B1	C1	D1	E1	F1	<b>324009 0001</b>	89,-	<b>324010 0001</b>	89,-
DWLN..2020 K08	20	125	34	25	20	WN..08	A2	B2	C2	D2	E2	F1	324009 0002	89,-	324010 0002	89,-
DWLN..2525 M08	25	150	34	32	25	WN..08	A2	B2	C2	D2	E2	F1	324009 0003	94,10	324010 0003	94,10
												3104		3104		

### Spare parts

Screw for spacer		Screw		Clamping claw		Spring		Spacer		Nickel-plated	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	324020 0001	3,94	B1	324020 0002	2,74	C1	324020 0007	11,50	D1	324020 0011	0,90
A2	324020 0004	3,94	B2	324020 0003	2,74	C2	324020 0008	11,50	D2	324020 0012	0,80
3106		3106		3106		3106		3106		7111	

## ATORN® MWLN tool holders, negative

- **MWLN R/L 95°**
- Setting angle 95°, for negative 0° trigonometric indexable inserts, 80° point angle
- **Use:** Longitudinal turning and facing



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts						Right-hand		Left-hand	
												art.no.	€	art.no.	€
MWLN..2020 K06	20	20	125	25	25	WN..0604..	A2	B1	C2	D2	E1	<b>320170 0620</b>	87,-	<b>320171 0620</b>	87,-
MWLN..2525 M06	25	25	150	25	32	WN..0604..	A2	B1	C2	D2	E1	320170 0625	93,60	320171 0625	93,60
MWLN..2020 K08	20	20	125	34	25	WN..0804..	A1	B2	C1	D1	E2	320170 0001	87,-	320171 0001	87,-
MWLN..2525 M08	25	25	150	34	32	WN..0804..	A1	B2	C1	D1	E2	320170 0002	93,60	320171 0002	93,60
MWLN..3232 P08	32	32	170	34	40	WN..0804..	A1	B2	C1	D1	E2	320170 0003	118,50	320171 0003	118,50
												3104		3104	

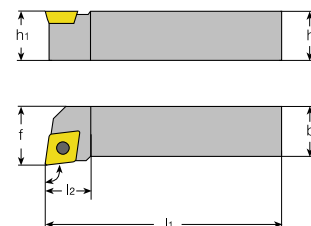
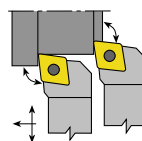
### Spare parts

Screw		Support plate		Clamping pin		Clamping claw		Nickel-plated			
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€		
A1	321601 0024	1,84	B1	321601 0025	9,95	C1	321601 0410	3,49	D1	321601 0503	14,80
A2	321601 0026	1,84	B2	324020 0022	5,55	C2	321601 0414	3,69	D2	321601 0504	15,30
3106		3164		3106		3106		7111			



## ATORN® Tool holders, positive SCLC

- **SCLC R/L 95°**
- Setting angle 95°, for positive 7° rhombic indexable inserts, 80° point angle
- **Use:** Longitudinal turning and facing



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts				Right-hand art.no. €	Left-hand art.no. €	
SCLC..1010 E06	10	10	70	9	12	CC..0602..		B1	D1	<b>320163 0000</b> 75,80	<b>320164 0000</b> 75,80	
SCLC..1212 F09	12	12	80	15	16	CC..09T3..		B2	D2	320163 0001 79,90	320164 0001 79,90	
SCLC..1616 H09	16	16	100	17	20	CC..09T3..		B2	D2	320163 0002 84,-	320164 0002 84,-	
SCLC..2020 K09	20	20	125	17	25	CC..09T3..		B2	D2	320163 0005 84,-	320164 0005 84,-	
SCLC..2525 M09	25	25	150	17	32	CC..09T3..		B2	D2	320163 0006 91,60	320164 0006 91,60	
SCLC..1616 H12	16	16	100	20	20	CC..1204..	A1	B3	C1	D2	320163 0007 84,-	320164 0007 84,-
SCLC..2020 K12	20	20	125	20	25	CC..1204..	A1	B3	C1	D2	320163 0003 84,-	320164 0003 84,-
SCLC..2525 M12	25	25	150	20	32	CC..1204..	A1	B3	C1	D2	320163 0004 91,60	320164 0004 91,60
										3104	3104	

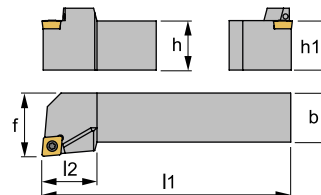
### Spare parts

Support plate		Screw		Screw		TORX	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0029	5,75	B1 321601 0210	3,27	C1 321601 0221	7,40	D1 703053 0070	1,93
		B2 321601 0216	3,53			D2 703053 0150	1,93
		B3 321601 0220	3,49				
3164		3164		3106		7114	

## ATORN® Clamp mounting, positive SCLC with internal cooling



- **SCLC R/L 95°**
- **With 1/8" GAS** internal cooling connection
- Setting angle 95°, for positive 7° rhombic indexable inserts, 80° point angle
- **Use:** Longitudinal turning and facing
- 1 x blind plug and 1 x connection nipple 1/8" included
- Fits hose set Art. No. 446312 0200 and 446312 0300



ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts			Right-hand art.no. €	Left-hand art.no. €
SCLC.. 1616 H09 A	16	100	18	20	16	CC..09	A1	B1	<b>324013 0001</b> 163,50	<b>324014 0001</b> 163,50
SCLC.. 2020 K09 A	20	125	22	25	20	CC..09	A1	B1	324013 0002 168,50	324014 0002 168,50
SCLC.. 2525 M09 A	25	125	25	25	25	CC..09	A1	B1	324013 0003 176,-	324014 0003 176,-
									3104	3104

### Spare parts

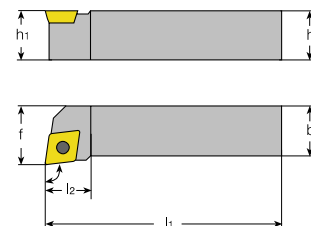
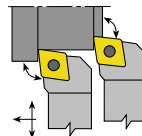
Screw		TORX	
art.no.	€	art.no.	€
A1 321601 0216	3,53	B1 703053 0150	1,93
3164		7114	

## ATORN® Tool holders, positive SCAC

NEW

- **SCAC R/L 90°**
- Setting angle 90°, for rhombic indexable inserts positive 7°, 80° point angle
- **Use:** for long automatic lathes

for long  
automatic lathes



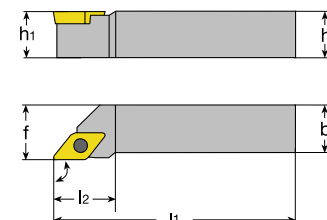
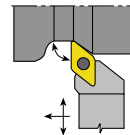
ISO designation	h=h1 mm	b mm	l1 mm	f mm	for indexable inserts			Right-hand		Left-hand	
								art.no.	€	art.no.	€
SCAC R/L 0808 X06-A	8	8	115	8	CC.. 0602..	A2	B1	320270 0001	74,80	320271 0001	74,80
SCAC R/L 1010 X06-A	10	10	115	10	CC.. 0602..	A2	B1	320270 0002	79,90	320271 0002	79,90
SCAC R/L 1212 X06-A	12	12	130	12	CC.. 0602..	A2	B1	320270 0003	84,-	320271 0003	84,-
SCAC R/L 1212 X09-A	12	12	130	12	CC.. 09T3..	A1	B2	320270 0004	84,-	320271 0004	84,-
SCAC R/L 1616 X09-A	16	16	130	16	CC.. 09T3..	A1	B2	320270 0005	89,-	320271 0005	89,-
								3104		3104	

### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	320901 2516	9,75	B1	703053 0080	1,93
A2	321701 0102	10,85	B2	703053 0150	1,93
		3164			7114

## ATORN® Tool holders, positive SDJC

- **SDJC R/L 93°**
- Setting angle 93°, for positive 7° rhombic indexable inserts, 55° point angle
- **Use:** Copy turning



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts					Right-hand		Left-hand	
											art.no.	€	art.no.	€
SDJC..1010 E07	10	10	70	14	12	DC..0702..		B1		D1	320165 0001	75,80	320166 0001	75,80
SDJC..1212 F07	12	12	80	16	16	DC..0702..		B1		D1	320165 0002	79,90	320166 0002	79,90
SDJC..1616 H07	16	16	100	16	20	DC..0702..		B1		D1	320165 0008	84,-	320166 0008	84,-
SDJC..1212 F11	12	12	80	18	16	DC..11T3..		B2		D2	320165 0006	79,90	320166 0006	79,90
SDJC..1616 H11	16	16	100	18	20	DC..11T3..	A1	B2	C1	D2	320165 0003	84,-	320166 0003	84,-
SDJC..2020 K11	20	20	125	22	25	DC..11T3..	A1	B3	C1	D2	320165 0004	84,-	320166 0004	84,-
SDJC..2525 M11	25	25	150	28	32	DC..11T3..	A1	B3	C1	D2	320165 0005	91,60	320166 0005	91,60
											3104		3104	

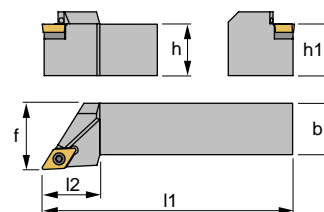
### Spare parts





Support plate		Screw		Screw		TORX					
	art.no.	€		art.no.	€		art.no.	€			
A1	321601 0022	15,50	B1	321601 0210	3,27	C1	321611 0013	12,10			
			B2	321601 0222	3,53		D1	703053 0070	1,93		
			B3	321601 0754	3,49		D2	703053 0150	1,93		
		3164			3164			3106			7114

## ATORN® Clamp mounting, positive SDJC with internal cooling







- **SDJC R/L 93°**
- **With 1/8" GAS internal cooling connection**
- Setting angle 93°, for rhombic indexable inserts positive 7°, 55° point angle
- **Use:** Copy turning
- 1 x blind plug and 1 x connection nipple 1/8" included
- Fits hose set Art. No. 446312 0200 and 446312 0300



ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts					<b>Right-hand</b> art.no.	€	<b>Left-hand</b> art.no.	€
SDJC.. 2020 K11 A	20	125	22	25	20	DC..11	A1	B1	C1	D1	<b>324015 0001</b>	<b>188,-</b>	<b>324016 0001</b>	<b>188,-</b>
SDJC.. 2525 M11 A	25	150	22	32	25	DC..11	A1	B1	C1	D1	<b>324015 0002</b>	<b>203,-</b>	<b>324016 0002</b>	<b>203,-</b>
											3104		3104	

### Spare parts

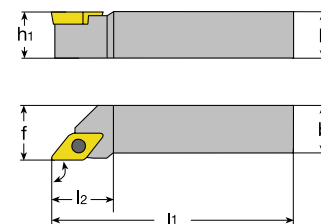
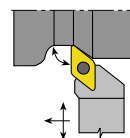
	<b>Screw</b> art.no.	€		<b>Support plate</b> art.no.	€		<b>Screw</b> art.no.	€		<b>TORX</b> art.no.	€
A1	321601 0021	<b>5,05</b>	B1	321601 0022	<b>15,50</b>	C1	321601 0754	<b>3,49</b>	D1	703053 0070	<b>1,93</b>
	3106			3164			3164			7114	



## ATORN® Tool holders, positive SDAC

**NEW**



- **SDJC R/L 90°**
- Setting angle 90°, for rhombic indexable inserts positive 7°, 55° point angle
- **Use:** for long automatic lathes

**for long  
automatic  
lathes**



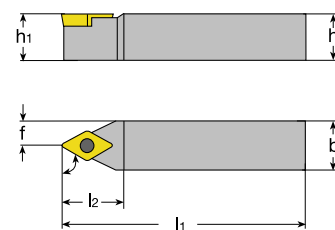
ISO designation	h=h1 mm	b mm	l1 mm	f mm	for indexable inserts			<b>Right-hand</b> art.no.	€	<b>Left-hand</b> art.no.	€
SDAC R/L 0808 X07-A	8	8	115	8	DC.. 0702..	A2	B1	<b>320272 0001</b>	<b>74,80</b>	<b>320273 0001</b>	<b>74,80</b>
SDAC R/L 1010 X07-A	10	10	115	10	DC.. 0702..	A2	B1	320272 0002	<b>79,90</b>	320273 0002	<b>79,90</b>
SDAC R/L 1212 X07-A	12	12	130	12	DC.. 0702..	A2	B1	320272 0003	<b>84,-</b>	320273 0003	<b>84,-</b>
SDAC R/L 1616 X07-A	16	16	130	16	DC.. 0702..	A2	B1	320272 0004	<b>89,-</b>	320273 0004	<b>89,-</b>
SDAC R/L 1212 X11-A	12	12	130	12	DC.. 1113..	A1	B2	320272 0005	<b>84,-</b>	320273 0005	<b>84,-</b>
SDAC R/L 1616 X11-A	16	16	130	16	DC.. 1113..	A1	B2	320272 0006	<b>89,-</b>	320273 0006	<b>89,-</b>
								3104		3104	





### Spare parts

	<b>Screw</b> art.no.	€		<b>TORX</b> art.no.	€
A1	320901 2516	<b>9,75</b>	B1	703053 0080	<b>1,93</b>
A2	321701 0102	<b>10,85</b>	B2	703053 0150	<b>1,93</b>
	3164			7114	

## ATORN® Tool holders, positive SDNCN

- **SDNCN 62.5°**
- Setting angle 62.5°, for positive 7° rhombic indexable inserts, 55° point angle
- **Use:** Copy turning



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts					art.no.	€
SDNCN 0808 D07	8	8	60	9	4	DC..0702..			C1	D1	<b>320167 0001</b>	<b>70,70</b>
SDNCN 1010 E07	10	10	70	11	5	DC..0702..			C1	D1	320167 0002	75,80
SDNCN 1212 F07	12	12	80	13	6	DC..0702..			C1	D1	320167 0003	79,90
SDNCN 1616 H11	16	16	100	16	8	DC..11T3..	A1	B1	C2	D2	320167 0004	84,-
SDNCN 2020 K11	20	20	125	20	10	DC..11T3..	A1	B1	C2	D2	320167 0005	88,-
SDNCN 2525 M11	25	25	150	25	12.5	DC..11T3..	A1	B1	C2	D2	320167 0006	91,60

3104

### Spare parts

Screw		Support plate		Screw		TORX	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0021	5,05	B1 321601 0022	15,50	C1 321601 0210	3,27	D1 703053 0070	1,93
				C2 321601 0754	3,49	D2 703053 0150	1,93
3106		3164		3164		7114	

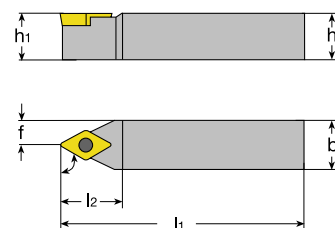
## ATORN® Tool holders, positive SDNCN



NEW

- **SDNCN 62.5°**
- Setting angle 62.5°, for rhombic indexable inserts positive 7°, 55° point angle
- **Use:** for long automatic lathes



for long  
automatic lathes



ISO designation	h=h1 mm	b mm	l1 mm	f mm	for indexable inserts			art.no.	€
SDNC N 1010 X07-A	10	10	115	5	DC.. 0702..	A2	B1	<b>320274 0001</b>	<b>79,90</b>
SDNC N 1212 X11-A	12	12	130	6	DC.. 11T3..	A1	B2	320274 0002	84,-
SDNC N 1616 X11-A	16	16	130	8	DC.. 11T3..	A1	B2	320274 0003	89,-

3104

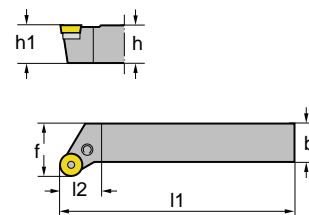
### Spare parts

Screw		TORX	
art.no.	€	art.no.	€
A1 320901 2516	9,75	B1 703053 0080	1,93
A2 321701 0102	10,85	B2 703053 0150	1,93
3164		7114	

## ATORN® Tool holders, positive SRGC

**NEW**

- **SRGC R/L 95°**
- Setting angle 95°, for round indexable inserts positive 7°
- **Use:** Longitudinal turning, copy turning and facing



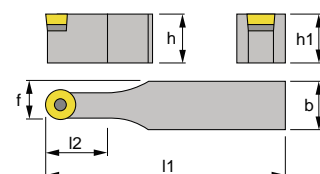
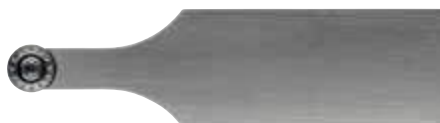
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts				Right-hand		Left-hand		
										art.no.	€	art.no.	€	
SRGC R/L 1616 H08	16	16	100	14.7	20	RC.T 0803..		B2	D1	320250 1608	90,60	320251 1608	90,60	
SRGC R/L 2020 K08	20	20	125	16.4	25	RC.T 0803..		B2	D1	320250 2008	107,-	320251 2008	107,-	
SRGC R/L 2525 M08	25	25	150	19.8	32	RC.T 0803..		B2	D1	320250 2508	117,-	320251 2508	117,-	
SRGC R/L 1616 H10	16	16	100	15.5	20	RC.T 1003..	A1	B1	C1	D2	320250 1610	90,60	320251 1610	90,60
SRGC R/L 2020 K10	20	20	125	17.2	25	RC.T 1003..	A1	B1	C1	D2	320250 2010	107,-	320251 2010	107,-
SRGC R/L 2525 M10	25	25	150	20.7	32	RC.T 1003..	A1	B1	C1	D2	320250 2510	117,-	320251 2510	117,-
										3104		3104		

### Spare parts

Support plate		Screw		Screw		TORX	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	321601 0123 18,15	B1	321611 0011 7,95	C1	321611 0013 12,10	D1	703053 0080 1,93
		B2	321701 0112 10,-			D2	703053 0150 1,93
	3106		3164		3106		7114

## ATORN® Tool holders, positive SRDCN

- **SRDCN 90°**
- Setting angle 90°, for positive 7° round indexable inserts
- **Use:** Copy turning



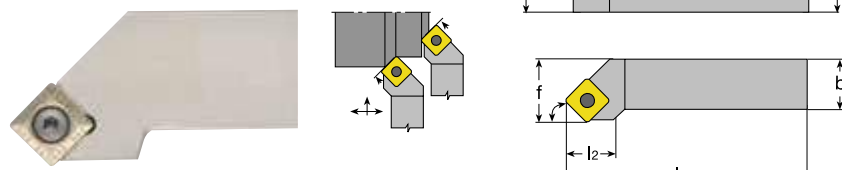
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts					art.no.	€
SRDCN 2020 K08	20	20	125	16.4	10	RC.T 0803..		B1	D1	320249 2008	86,-	
SRDCN 2525 M08	25	25	150	16.4	12.5	RC.T 0803..		B1	D1	320249 2508	99,70	
SRDCN 1616 H10	16	16	100	20.3	8	RC.T 1003..		B2	C1	D2	320249 1610	88,-
SRDCN 2020 K10	20	20	125	20.3	10	RC.T 1003..	A1	B2	C1	D2	320249 2010	88,-
SRDCN 2525 M10	25	25	150	20.3	12.5	RC.T 1003..	A1	B2	C1	D2	320249 2510	102,50
SRDCN 2020 K12	20	20	125	20.3	10	RC.T 1204..	A2	B2	C1	D2	320249 2012	102,50
SRDCN 2525 M12	25	25	150	20.3	12.5	RC.T 1204..	A2	B2	C1	D2	320249 2512	116,-
										3104		

### Spare parts

Support plate		Screw		Screw		TORX	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	321601 0123 18,15	B1	321601 0210 3,27	C1	321611 0013 12,10	D1	703053 0080 1,93
A2	321601 0139 30,60	B2	321611 0011 7,95			D2	703053 0150 1,93
	3106		3164		3106		7114

## ATORN® Tool holders, positive SSSC

- **SSSC R/L 45°**
- Setting angle 45°, for positive 7° square indexable inserts, 90° point angle
- **Use:** Longitudinal turning and facing, chamfering



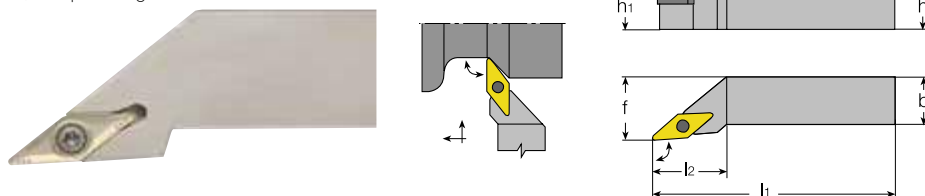
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts					Right-hand art.no.	€	Left-hand art.no.	€
SSSC..1212 F09	12	12	80	11	16	SC..09T3..			B1	D1	320184 0001	79,90	320185 0001	79,90
SSSC..1616 H09	16	16	100	22	20	SC..09T3..			B1	D1	320184 0002	84,-	320185 0002	84,-
SSSC..2020 K12	20	20	125	22	25	SC..1204..	A1	B2	C1	D1	320184 0003	84,-	320185 0003	84,-
SSSC..2525 M12	25	25	150	22	32	SC..1204..	A1	B2	C1	D1	320184 0004	91,60	320185 0004	91,60
											3104		3104	

### Spare parts

Support plate		Screw		Screw		TORX	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0030	9,05	B1 321601 0216	3,53	C1 321601 0221	7,40	D1 703053 0150	1,93
		B2 321601 0220	3,49				
3106		3164		3106		7114	

## ATORN® Tool holders, positive SVJC

- **SVJC R/L 93°**
- Setting angle 93°, for positive 7° rhombic indexable inserts, 35° point angle
- **Use:** Longitudinal and copy turning



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts					Right-hand art.no.	€	Left-hand art.no.	€
SVJC..1212 F11	12	12	80	21.5	16	VC..1103..			C1	D1	320188 1212	88,50	320189 1212	88,50
SVJC..1616 H11	16	16	100	24	20	VC..1103..			C1	D1	320188 1616	97,20	320189 1616	97,20
SVJC..2020 K11	20	20	125	23	25	VC..1103..			C1	D1	320188 2020	107,50	320189 2020	107,50
SVJC..2525 M11	25	25	150	27	32	VC..1103..			C1	D1	320188 2525	122,-	320189 2525	122,-
SVJC..2020 K16	20	20	125	30	25	VC..1604..	A1	B1	C2	D2	320188 0001	107,50	320189 0001	107,50
SVJC..2525 M16	25	25	150	33	32	VC..1604..	A1	B1	C2	D2	320188 0002	122,-	320189 0002	122,-
SVJC..3225 P16	32	25	170	34	32	VC..1604..	A1	B1	C2	D2	320188 0003	159,-	320189 0003	159,-
											3104		3104	

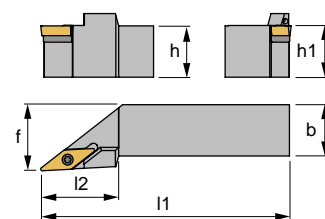
### Spare parts

Screw		Spacer		Screw		TORX	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0021	5,05	B1 321601 0027	10,50	C1 321601 0210	3,27	D1 703053 0070	1,93
				C2 321601 0754	3,49	D2 703053 0150	1,93
3106		3164		3164		7114	

## ATORN® Clamp mounting, positive SVJC with internal cooling



- SVJC R/L 93°
- With 1/8" GAS internal cooling connection
- Setting angle 93°, for positive 7° rhombic indexable inserts, 35° point angle
- Use: Longitudinal turning and copy turning
- 1 x blind plug and 1 x connection nipple 1/8" included
- Fits hose set Art. No. 446312 0200 and 446312 0300



ISO designation	b mm	l1 mm	l2 mm	f mm	h=h1 mm	for indexable inserts					Right-hand art.no.	€	Left-hand art.no.	€		
SVJC.. 2020 K11 A	20	125	25	25	20	VC..11					C1	D1	324017 0001	168,50	324018 0001	168,50
SVJC.. 2020 K16 A	20	125	37	25	20	VC..16	A1	B1	C2	D2	324017 0002	168,50	324018 0002	168,50		
											3104		3104			

### Spare parts

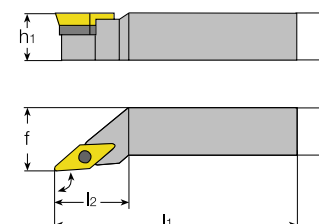
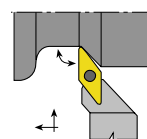
Screw			Spacer			Screw			TORX		
	art.no.	€		art.no.	€		art.no.	€		art.no.	€
A1	321601 0021	5,05	B1	321601 0027	10,50	C1	321601 0210	3,27	D1	703053 0070	1,93
						C2	321601 0754	3,49	D2	703053 0150	1,93
	3106			3164			3164			7114	

## ATORN® Tool holders, positive SVJC

NEW

- SVJC R/L 93°
- Setting angle 93°, for rhombic indexable inserts positive 7°, 35° point angle
- Use: for long automatic lathes

for long automatic lathes



ISO designation	h=h1 mm	b mm	l1 mm	f mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
SVJC R/L 0808 X11-A	8	8	115	8	VC.. 1103..	A2	B1	320277 0001	74,80	320278 0001	74,80
SVJC R/L 1010 X11-A	10	10	115	10	VC.. 1103..	A2	B1	320277 0002	79,90	320278 0002	79,90
SVJC R/L 1212 X11-A	12	12	130	12	VC.. 1103..	A2	B1	320277 0003	84,-	320278 0003	84,-
SVJC R/L 1616 X11-A	16	16	130	16	VC.. 1103..	A2	B1	320277 0004	89,-	320278 0004	89,-
SVJC R/L 1212 X16-A	12	12	130	12	VC.. 1604..	A1	B2	320277 0005	84,-	320278 0005	84,-
SVJC R/L 1616 X16-A	16	16	130	16	VC.. 1604..	A1	B2	320277 0006	89,-	320278 0006	89,-
								3104		3104	

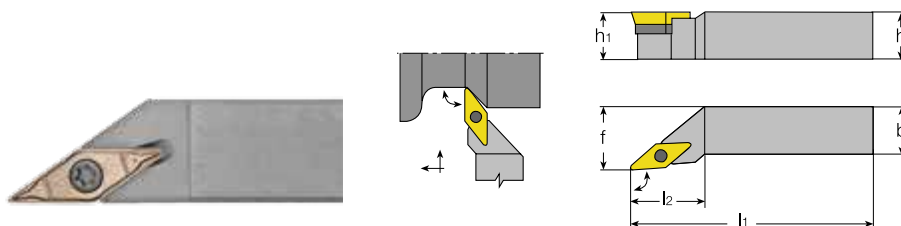
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	320901 2516	9,75	B1	703053 0080	1,93
A2	321701 0102	10,85	B2	703053 0150	1,93
	3164			7114	



**ATORN® Tool holders, positive SVAC****NEW**

- **SVAC R/L 90°**
- Setting angle 90°, for rhombic indexable inserts positive 7°, 35° point angle
- **Use:** for long automatic lathes

**for long automatic lathes**

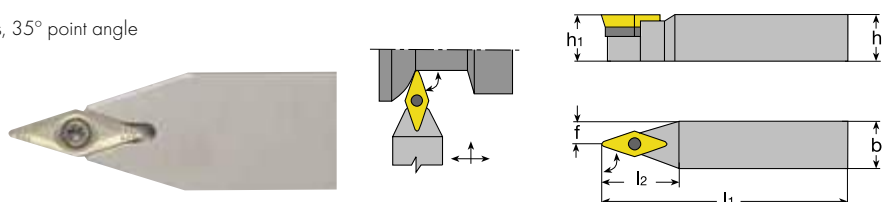
ISO designation	h=h1 mm	b mm	l1 mm	f mm	for indexable inserts			Right-hand		Left-hand	
								art.no.	€	art.no.	€
SVAC R/L 0808 X11-A	8	8	115	8	VC..1103..	A2	B1	320275 0001	74,80	320276 0001	74,80
SVAC R/L 1010 X11-A	10	10	115	10	VC..1103..	A2	B1	320275 0002	79,90	320276 0002	79,90
SVAC R/L 1212 X11-A	12	12	130	12	VC..1103..	A2	B1	320275 0003	84,-	320276 0003	84,-
SVAC R/L 1616 X11-A	16	16	130	16	VC..1103..	A2	B1	320275 0004	89,-	320276 0004	89,-
SVAC R/L 1212 X16-A	12	12	130	12	VC..1604..	A1	B2	320275 0005	84,-	320276 0005	84,-
SVAC R/L 1616 X16-A	16	16	130	16	VC..1604..	A1	B2	320275 0006	89,-	320276 0006	89,-
								3104		3104	

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
	A1 320901 2516	9,75		B1 703053 0080	1,93
	A2 321701 0102	10,85		B2 703053 0150	1,93
		3164			7114

**ATORN® Clamp mounting, positive SVVC**

- **SVVC 72,5°**
- Setting angle 72.5°, for positive 7° rhombic indexable inserts, 35° point angle
- **Use:** Copy turning



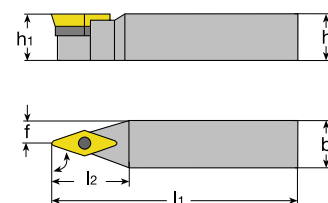
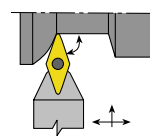
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts					art.no.		€	
SVVCN 2020 K16	20	20	125	37	10.6	VC..1604..	A1	B1	C1	D1	320192 0001	107,50		
SVVCN 2525 M16	25	25	150	37	13.1	VC..1604..	A1	B1	C1	D1	320192 0002	122,-		
											3106		7114	

**Spare parts**

Screw			Spacer			Screw			TORX		
	art.no.	€		art.no.	€		art.no.	€		art.no.	€
	A1 321601 0021	5,05		B1 321601 0027	10,50		C1 321601 0754	3,49		D1 703053 0150	1,93
		3106			3164			3164			7114

**ATORN® Tool holders, positive SVVC****NEW**

- **SVVC R/L 72.5°**
- Setting angle 72.5°, for rhombic indexable inserts positive 7°, 35° point angle
- **Use:** for long automatic lathes

**for long automatic lathes**

ISO designation	h=h1 mm	b mm	l1 mm	f mm	for indexable inserts			art.no.	€
SVVC N 1010 X11-A	10	10	115	5	VC.. 1103..	A2	B1	<b>320279 0001</b>	<b>74,80</b>
SVVC N 1212 X11-A	12	12	130	6	VC.. 1103..	A2	B1	320279 0002	84,-
SVVC N 1616 X11-A	16	16	130	8	VC.. 1103..	A2	B1	320279 0003	89,-
SVVC N 1212 X16-A	12	12	130	6	VC.. 1604..	A1	B2	320279 0004	84,-
SVVC N 1616 X16-A	16	16	130	8	VC.. 1604..	A1	B2	320279 0005	89,-

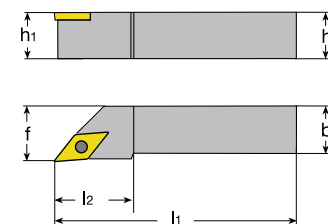
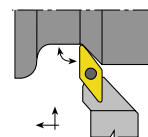
3104

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	320901 2516	<b>9,75</b>	B1	703053 0080	<b>1,93</b>
A2	321701 0102	<b>10,85</b>	B2	703053 0150	<b>1,93</b>
	3164			7114	

**ATORN® Tool holders, positive SVJB**

- **SVJB R/L 93°**
- Setting angle 93°, for positive 5° rhombic indexable inserts, 35° point angle
- **Use:** Longitudinal and copy turning



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts					Right-hand art.no.	€	Left-hand art.no.	€
SVJB..2020 K16	20	20	125	37	25	VB..1604..	A1	B1	C1	D1	<b>320190 1620</b>	<b>107,50</b>	<b>320191 1620</b>	<b>107,50</b>
SVJB..2525 M16	25	25	150	37	32	VB..1604..	A1	B1	C1	D1	320190 1625	122,-	320191 1625	122,-

3104

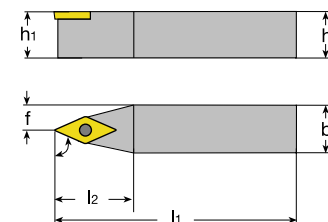
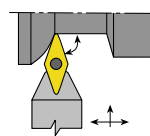
3104

**Spare parts**

Screw			Spacer			Screw			TORX		
	art.no.	€		art.no.	€		art.no.	€		art.no.	€
A1	321601 0021	<b>5,05</b>	B1	321601 0027	<b>10,50</b>	C1	321601 0754	<b>3,49</b>	D1	703053 0150	<b>1,93</b>
	3106			3164			3164			7114	

**ATORN® Clamp mounting, positive SVVB**

- **SVVB 72,5°**
- Setting angle 72.5°, for positive 5° rhombic indexable inserts, 35° point angle
- **Use:** Longitudinal and copy turning



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts					art.no.	€
SWBN 2020 K16	20	20	125	37	10.0	VB..1604..	A1	B1	C1	D1	<b>320195 1620</b>	<b>107,50</b>
SWBN 2525 M16	25	25	150	37	12.5	VB..1604..	A1	B1	C1	D1	320195 1625	122,-
SWBN 3225 P16	32	25	170	37	13.1	VB..1604..	A1	B1	C1	D1	320195 1632	159,-

3104

**Spare parts**

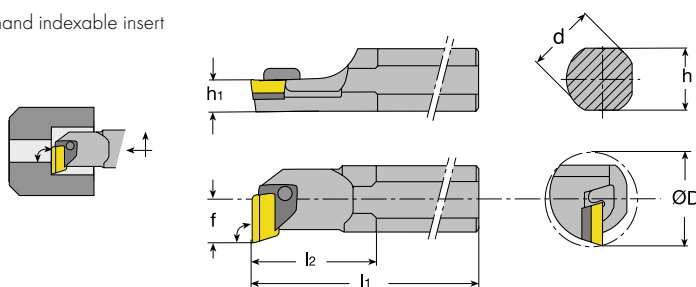
Screw			Spacer			Screw			TORX		
	art.no.	€		art.no.	€		art.no.	€		art.no.	€
A1	321601 0021	<b>5,05</b>	B1	321601 0027	<b>10,50</b>	C1	321601 0754	<b>3,49</b>	D1	703053 0150	<b>1,93</b>
	3106			3164			3164			7114	

## ATORN® Boring bar, negative CKUN

- **CKUN R/L 93°**
- Setting angle 93°, for negative 0° KNUX indexable inserts
- **Use:** Longitudinal turning
- Note: right-hand boring bar = left-hand indexable insert, left-hand boring bar = right-hand indexable insert



Figure shows right-hand boring bar, left-hand boring bar is mirror image



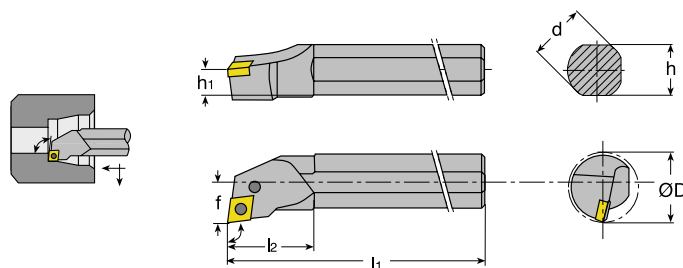
ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts									Right-hand art.no.	€	Left-hand art.no.	€
S25T CKUNL 16	25	23	11.5	300	50	20.5	37	KNUX 1604..	B1	C1			E1	F2	G1				<b>321504 0025</b>	<b>172,-</b>
S25T CKUNR 16	25	23	11.5	300	50	20.5	37	KNUX 1604..	B2	C1			E1	F2	G1		<b>321503 0025</b>	<b>172,-</b>		
S32U CKUNL 16	32	30	15	350	54	22	39	KNUX 1604..	A2	B1	C1	D1	E1	F3	G1				321504 0032	250,-
S32U CKUNR 16	32	30	15	350	54	22	39	KNUX 1604..	A1	B2	C1	D1	E1	F3	G1		321503 0032	250,-		
S40V CKUNR 16	40	37	18.5	400	60	27	48	KNUX 1604..	A1	B2	C1	D1	E1	F1	G1		321503 0040	275,-		
																	3104		3104	

### Spare parts

	Support plate art.no.	€	Clamping lever art.no.	€	Screw art.no.	€	Pin art.no.	€	Spring art.no.	€	Spring pin art.no.	€	Nickel-plated art.no.	€																
A1	321601 0018	11,80	B1	321601 0114	13,90	C1	321601 0215	3,49	D1	321601 0408	1,40	E1	321601 0901	1,33	F1	321601 0903	3,03	G1	703005 0040	0,52										
A2	321601 0019	11,80	B2	321601 0115	13,90										F2	321601 0904	3,03													
															F3	321601 0905	3,03													
																	3106		3106		3164		3106		3106		3106		7111	

## ATORN® Boring bar, negative PCLN

- **PCLN R/L 95°**
- Setting angle 95°, for negative 0° rhombic indexable inserts, 80° point angle
- **Use:** Longitudinal turning



ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts									Right-hand art.no.	€	Left-hand art.no.	€
S25T PCLN..12	25	23	11.5	300	40	17	31	CN..1204..		B5	C5				F1		<b>321515 0025</b>	<b>171,50</b>	<b>321516 0025</b>	<b>171,50</b>
S32U PCLN..12	32	30	15	350	50	22	39	CN..1204..	A1	B3	C4	D1	E1	F2		321515 0032	190,50	321516 0032	190,50	
S40V PCLN..12	40	37	18.5	400	60	27	48	CN..1204..	A1	B1	C1	D1	E1	F2		321515 0040	285,-	321516 0040	285,-	
S40V PCLN..16	40	37	18.5	400	50	27	48	CN..1606..	A2	B2	C2	D2	E2	F2		321515 0001	260,-	321516 0001	260,-	
S50W PCLN..16	50	47	23.5	450	65	35	61	CN..1606..	A2	B2	C2	D2	E2	F2		321515 0050	355,-	321516 0050	355,-	
S50W PCLN..19	50	47	23.5	450	60	35	61	CN..1906..	A3	B4	C3	D3	E3	F3		321515 0002	380,-	321516 0002	380,-	
																	3104		3104	

### With internal cooling

- one clamping surface from above

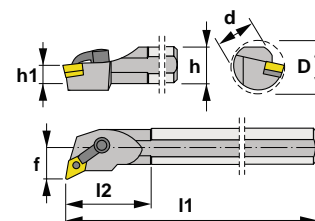
ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts									Right-hand art.no.	€	Left-hand art.no.	€
A25R PCLN..12	25	23	11.5	200	40	17	32	CN..1204..		B5	C5				F1		<b>321515 0125</b>	<b>191,-</b>	<b>321516 0125</b>	<b>191,-</b>
A32S PCLN..12	32	30	15	250	50	22	40	CN..1204..	A1	B3	C4	D1	E1	F2		321515 0132	212,-	321516 0132	212,-	
																	3104		3104	

### Spare parts

	Support plate art.no.	€	Clamping lever art.no.	€	Screw art.no.	€	Hollow pin art.no.	€	Pin art.no.	€	Nickel-plated art.no.	€										
A1	321601 0007	9,05	B1	321601 0102	12,05	C1	321601 0202	3,49	D1	321601 0302	1,17	F1	703005 0025	0,39								
A2	321601 0008	13,65	B2	321601 0103	11,55	C2	321601 0203	3,27	D2	321601 0303	1,17	F2	703005 0030	0,39								
A3	321601 0009	21,30	B3	321601 0108	11,35	C3	321601 0204	3,27	D3	321601 0309	1,67	F3	703005 0040	0,52								
			B4	321601 0110	16,90	C4	321601 0209	3,49														
			B5	321601 0112	12,05	C5	321601 0217	3,49														
													3164		3106		3106		3106		7111	

## ATORN® Boring bar, negative MCLN

- **MCLN R/L 95°**
- Setting angle 95°, for rhombic indexable inserts negative 0°, 80° point angle
- **Use:** Longitudinal turning



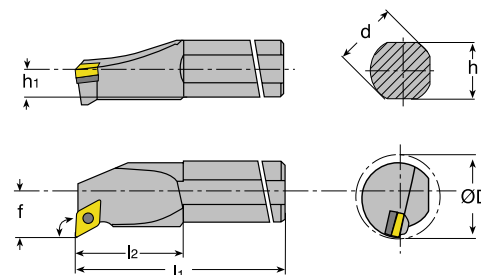
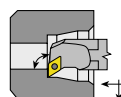
ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€	
S25T MCLN.. 12-K	25	23	11.5	300	40	17	31	CN.. 1204..		B1		D1	E2	F1	G1	321570 0025	197,-	321571 0025	197,-
S32U MCLN.. 12-K	32	30	15	350	45	22	39	CN.. 1204..	A1		C1	D1	E1	F1	G1	321570 0032	256,-	321571 0032	256,-
S40V MCLN.. 12-K	40	37	18.5	400	50	27	48	CN.. 1204..	A1		C1	D1	E1	F1	G1	321570 0040	286,-	321571 0040	286,-
																3104		3104	

### Spare parts

Support plate	Clamping pin	Clamping pin	Clamping claw	Screw	Black, oiled	Nickel-plated
art.no.	art.no.	art.no.	art.no.	art.no.	art.no.	art.no.
A1 321601 0134 <b>9,95</b>	B1 321601 0136 <b>4,34</b>	C1 321601 0137 <b>9,55</b>	D1 321601 0138 <b>11,45</b>	E1 321601 0212 <b>3,97</b> E2 321601 0219 <b>3,97</b>	F1 703001 0025 <b>0,29</b>	G1 703005 0030 <b>0,39</b>
3164	3106	3106	3106	3106	7111	7111

## ATORN® Boring bar, negative PDUN

- **PDUN R/L 93°**
- Setting angle 93°, for negative 0° rhombic indexable inserts, 55° point angle
- **Use:** Longitudinal turning



ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€	
S20S PDUN..11	20	18	9	250	29	13	25	DN..1104..	A2	B1	C4	D1	E1	F1	321501 0020	178,-	321502 0020	178,-	
S25T PDUN..11	25	23	11.5	300	40	17	32	DN..1104..	A2	B1	C1	D1	E1	F1	321501 0025	182,50	321502 0025	182,50	
S32U PDUN..11	32	30	15	350	45	22	39	DN..1104..	A2	B1	C1	D1	E1	F1	321501 0001	321,-	321502 0001	321,-	
S32U PDUN..15	32	30	15	350	50	22	39	DN..1506..	A1	B2	C3	D2	E2	F2	321501 0032	198,50	321502 0032	198,50	
S40V PDUN..15	40	37	18.5	400	60	27	48	DN..1506..	A1	B2	C2	D2	E2	F2	321501 0040	250,-	321502 0040	250,-	
S50W PDUN..15	50	47	23.5	450	65	35	61	DN..1506..	A1	B2	C2	D2	E2	F2	321501 0050	336,-	321502 0050	336,-	
																3104		3104	

### With internal cooling

- one clamping surface from above

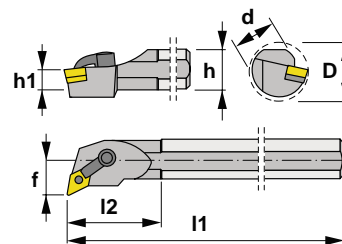
ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€	
A25R PDUN..11	25	23	11.5	200	40	17	32	DN..1104..	A2	B1	C1	D1	E1	F1	321501 0125	217,-	321502 0125	217,-	
A32S PDUN..15	32	30	15	250	50	22	40	DN..1506..	A1	B2	C3	D2	E2	F2	321501 0132	217,-	321502 0132	217,-	
A40T PDUN..15	40	37	18.5	300	60	27	50	DN..1506..	A1	B2	C2	D2	E2	F2	321501 0140	274,-	321502 0140	274,-	
																3104		3104	

### Spare parts

Support plate	Clamping lever	Screw	Hollow pin	Pin	Nickel-plated
art.no.	art.no.	art.no.	art.no.	art.no.	art.no.
A1 321601 0010 <b>8,80</b>	B1 321601 0101 <b>11,55</b>	C1 321601 0201 <b>3,49</b>	D1 321601 0301 <b>0,91</b>	E1 321601 0401 <b>1,33</b>	F1 703005 0025 <b>0,39</b>
A2 321601 0012 <b>15,50</b>	B2 321601 0107 <b>12,95</b>	C2 321601 0206 <b>3,27</b> C3 321601 0209 <b>3,49</b> C4 321601 0213 <b>3,49</b>	D2 321601 0302 <b>1,17</b>	E2 321601 0402 <b>1,33</b>	F2 703005 0030 <b>0,39</b>
3164	3106	3106	3106	3106	7111

## ATORN® Boring bar, negative MDUN

- MDUN R/L 93°
- Setting angle 93°, for rhombic indexable inserts negative 0°, 55° point angle
- Use: Longitudinal turning



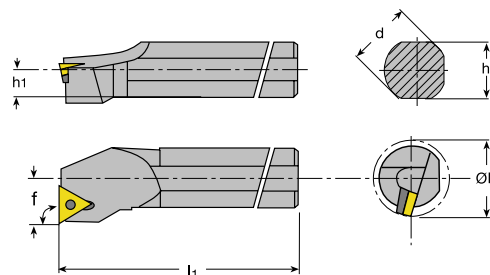
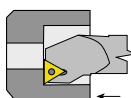
ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts	Right-hand						Left-hand				
									art.no.						art.no.				
S25T MDUN..15-K	25	23	11.5	300	40	17	31	DN..1506..	A1		C1	D2		F1	G1	321572 0025	197,-	321573 0025	197,-
S32U MDUN..15-K	32	30	15	350	45	22	39	DN..1506..	A1	B1		D1	E1	F1	G1	321572 0032	256,-	321573 0032	256,-
S40V MDUN..15-K	40	37	18.5	400	50	27	48	DN..1506..	A1	B1		D1	E1	F1	G1	321572 0040	286,-	321573 0040	286,-
																3104		3104	

### Spare parts

Clamping lever		Clamping pin		Clamping pin		Screw		Spacer		Black, oiled		Nickel-plated								
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€							
A1	321601 0118	13,40	B1	321601 0135	9,55	C1	321601 0136	4,34	D1	321601 0212	3,97	E1	324020 0016	8,30	F1	703001 0025	0,29	G1	703005 0030	0,39
	3106		3106		3106		3106		3106		7111		7111							

## ATORN® Boring bar, negative PTFN

- PTFN R/L 90°
- Setting angle 90°, for negative 0° triangular indexable inserts, 90° point angle
- Use: Longitudinal turning



ISO designation	d mm	h mm	h1 mm	l1 mm	f mm	D min. mm	for indexable inserts	Right-hand						Left-hand			
								art.no.						art.no.			
S25T PTFN..16	25	23	11.5	300	17	31	TN..1604..		B3	C3		F1	321510 0025	175,-	321511 0025	175,-	
S32U PTFN..16	32	30	15	350	22	39	TN..1604..	A1	B1	C1	D2	E1	F2	321510 0032	203,-	321511 0032	203,-
S40V PTFN..22	40	37	18.5	400	27	48	TN..2204..	A2	B2	C2	D1	E2	F3	321510 0040	280,-	321511 0040	280,-
S50W PTFN..22	50	47	23.5	450	35	61	TN..2204..	A2	B2	C2	D1	E2	F3	321510 0050	346,-	321511 0050	346,-
														3104		3104	

### With internal cooling

- one clamping surface from above

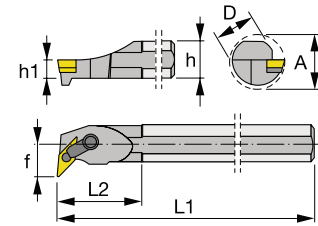
ISO designation	d mm	h mm	h1 mm	l1 mm	f mm	D min. mm	for indexable inserts	Right-hand						Left-hand			
								art.no.						art.no.			
A25R PTFN..16	25	23	11.5	200	17	32	TN..1604..		B3	C3		F1	321510 0125	203,-	321511 0125	203,-	
A32S PTFN..16	32	30	15	250	22	40	TN..1604..	A1	B1	C1	D2	E1	F2	321510 0132	228,-	321511 0132	228,-
														3104		3104	

### Spare parts

Support plate		Clamping lever		Screw		Hollow pin		Pin		Nickel-plated							
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€						
A1	321601 0001	7,90	B1	321601 0101	11,55	C1	321601 0201	3,49	D1	321601 0302	1,17	E1	321601 0401	1,33	F1	703005 0020	0,39
A2	321601 0002	10,70	B2	321601 0102	12,05	C2	321601 0202	3,49	D2	321601 0308	0,90	E2	321601 0402	1,33	F2	703005 0025	0,39
	3164		3106		3106		3106		3106		7111		7111				

## ATORN® Boring bar, negative MVUN

- **MVUN R/L 93°**
- Setting angle 93°, for negative 0° rhombic indexable inserts, 35° point angle
- **Use:** Longitudinal and copy turning



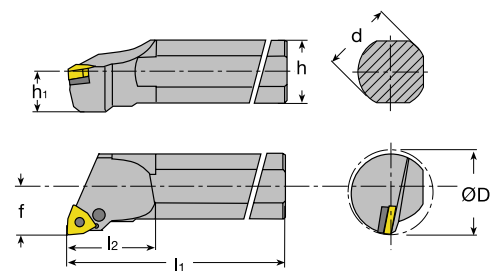
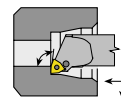
ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
S25T MVUN..16-K	25	23	11.5	300	40	17	31	VN..1604..	A1	B2	C1	D1	E1	F1	321574 0025	187,-	321575 0025	187,-
S32U MVUN..16-K	32	30	15	350	45	22	39	VN..1604..	A1	B1	C1	D1	E1	F1	321574 0032	212,-	321575 0032	212,-
S40V MVUN..16-K	40	37	18.5	400	50	27	48	VN..1604..	A1	B1	C1	D1	E1	F1	321574 0040	288,-	321575 0040	288,-
															3104		3104	

### Spare parts

art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0118	13,40	B1 321601 0212	3,97	C1 321601 0407	11,35	D1 324020 0020	9,30	E1 703001 0025	0,29	F1 703005 0030	0,39
3106		3106		3106		3106		7111		7111	

## ATORN® Boring bar, negative PWLN

- **PWLN R/L 95°**
- Setting angle 95°, for negative 0° trigonometric indexable inserts, 80° point angle
- **Use:** Longitudinal turning



ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
S16R PWLN..06	16	14	7	200	24	11	20	WN..0604..		B4	C4			F1	321531 0616	151,-	321532 0616	151,-
S20S PWLN..06	20	18	9	250	36	13	27	WN..0604..		B4	C4			F1	321531 0620	157,-	321532 0620	157,-
S25T PWLN..06	25	23	11.5	300	40	17	31	WN..0604..	A2	B1	C1	D1	E1	F1	321531 0625	175,-	321532 0625	175,-
S25T PWLN..08	25	23	11.5	300	40	17	31	WN..0804..		B3	C3			F2	321531 0825	175,-	321532 0825	175,-
S32U PWLN..08	32	30	15	350	50	22	39	WN..0804..	A1	B2	C2	D2	E2	F2	321531 0832	196,50	321532 0832	196,50
S40V PWLN..08	40	37	18.5	400	60	27	48	WN..0804..	A1	B2	C2	D2	E2	F2	321531 0840	270,-	321532 0840	270,-
															3104		3104	

### With internal cooling

- With one clamping surface from above

ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts							Right-hand art.no.	€	Left-hand art.no.	€
A16M PWLN..06	16	15	7.5	150	30	11	20	WNN.0604..		B4	C4			F1	321533 0616	164,-	321534 0616	164,-
A20Q PWLN..06	20	18	9.0	180	35	13	27	WNN.0604..		B4	C4			F1	321533 0620	170,50	321534 0620	170,50
A25R PWLN..08	25	23	11.5	200	40	17	31	WNN.0804..		B3	C3			F2	321533 0825	190,-	321534 0825	190,-
A32S PWLN..08	32	30	15	250	45	22	39	WNN.0804..	A1	B2	C2	D2	E2	F2	321533 0832	212,-	321534 0832	212,-
															3104		3104	

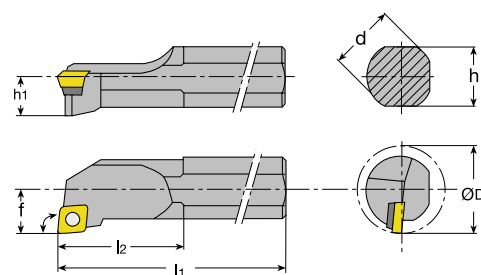
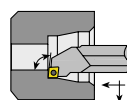
### Spare parts

art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 321601 0016	9,70	B1 321601 0101	11,55	C1 321601 0201	3,49	D1 321601 0301	0,91	E1 321601 0401	1,33	F1 703005 0025	0,39
A2 321601 0031	9,95	B2 321601 0102	12,05	C2 321601 0202	3,49	D2 321601 0302	1,17	E2 321601 0402	1,33	F2 703005 0030	0,39
		B3 321601 0108	11,35	C3 321601 0209	3,49						
		B4 321601 0113	11,55	C4 321601 0213	3,49						
3164		3106		3106		3106		3106		7111	

## ATORN® Boring bar, positive SCLC



- **SCLC R/L 95°**
- Setting angle 95°, for positive 7° rhombic indexable inserts, 80° point angle
- **Use:** Longitudinal turning



### Standard version with internal cooling

ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts	Screw	Support plate	Screw	TORX	Right-hand		Left-hand	
													art.no.	€	art.no.	€
A 08 H SCLC R/L 06	8	7	3.5	100	17.8	6	10	CC..0602..	A1			D1	<b>321001 0108</b>	97,20	<b>321002 0108</b>	97,20
A 10 K SCLC R/L 06	10	9	4.5	125	17.7	7	12	CC..0602..	A1			D1	321001 0110	97,20	321002 0110	97,20
A 12 R SCLC R/L 06	12	11	5.5	140	24.2	9	16	CC..0602..	A1			D1	321001 0112	97,20	321002 0112	97,20
A 16 Q SCLC R/L 09	16	14	7.5	180	26.7	11	20	CC..09T3..	A2			D2	321001 0116	107,-	321002 0116	107,-
A 20 R SCLC R/L 09	20	18	9.0	200	36.7	13	25	CC..09T3..	A2			D2	321001 0120	113,50	321002 0120	113,50
A 25 R SCLC R/L 12	25	23	11.5	200	40.5	17	32	CC..1204..	A4			D3	321001 0126	148,-	321002 0126	148,-
A 32 S SCLC R/L 12	32	30	15.0	250	30	22	40	CC..1204..	A3	B1	C1	D2	321001 0132	180,50	321002 0132	180,50
A 40 T SCLC R/L 12	40	38	38.5	300	31	27	49	CC..1204..	A3	B1	C1	D2	321001 0140	258,-	321002 0140	258,-
													3104		3104	

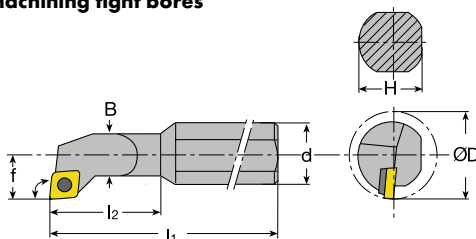
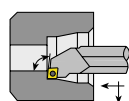
### Spare parts

Screw			Support plate			Screw			TORX		
art.no.	€		art.no.	€		art.no.	€		art.no.	€	
A1	320901 2513	11,65	B1	321611 0001	32,60	C1	321611 0012	12,10	D1	703053 0080	1,93
A2	320901 2516	9,75							D2	703053 0150	1,93
A3	321611 0010	7,95							D3	703053 0200	1,93
A4	321701 0108	9,75									
3164			3164			3106			7114		

## ATORN® Boring bar, positive SCLC



- **SCLC R/L 95°**
- Setting angle 95°, for positive 7° rhombic indexable inserts, 80° point angle
- **With internal cooling**
- **Use:** Longitudinal turning, **very well suited to machining tight bores**



### Boring bar, individual

ISO designation	d mm	H mm	l1 mm	l2 mm	f mm	B mm	D min. mm	for indexable inserts	Screw	Support plate	Screw	TORX	Right-hand		Left-hand	
													art.no.	€	art.no.	€
A 0608 H SCLC R/L 06	8	7	100	21.5	4.2	6	8	CC.. 0602..	A1	B1		D1	<b>321003 0008</b>	95,60	<b>321004 0008</b>	95,60
A 0810 J SCLC R/L 06	10	9	110	27	6	8	11	CC.. 0602..	A1	B1		D1	321003 0010	95,60	321004 0010	95,60
A 1012 K SCLC R/L 06	12	11	125	32.5	7	10	13	CC.. 0602..	A1	B1		D1	321003 0012	95,60	321004 0012	95,60
A 1216 M SCLC R/L 06	16	15	150	42	9	12	16	CC.. 0602..	A1	B1		D1	321003 0016	105,50	321004 0016	105,50
													3104		3104	

### Set

Contents												Right-hand		Left-hand		
												art.no.	€	art.no.	€	
1x A0608H SCLCR/L 06   1x A0810J SCLCR/L 06   1x A1012K SCLCR/L 06   1x A1216M SCLCR/L 06									A1	B1	<b>321003 1004</b>	259,-	<b>321004 1004</b>	259,-		
													3104		3104	

### Spare parts

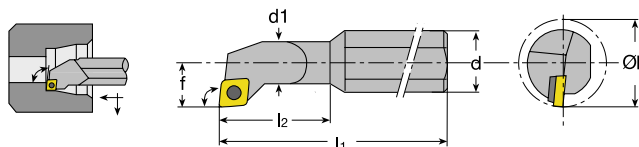
Screw			TORX		
art.no.	€		art.no.	€	
A1	320901 2513	11,65	B1	703053 0080	1,93
3164			7114		



## ATORN® SCLC HSS boring bars



- **SCLC R/L 95°**
- Setting angle 95°, for positive 7° rhombic indexable inserts, 80° point angle
- **With internal cooling**
- **Use:** Longitudinal turning, very well suited to machining tight bores
- Low-vibration boring bars
- Indexable inserts with longer service life
- HSS boring bars with longer service life



### Boring bar, individual

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
AH 0608 H SCLC R/L 06	6	8	100	25	4	8.5	CC..0602..	A1	B1	321103 0008	113,50	321104 0008	113,50
AH 0810 J SCLC R/L 06	8	10	110	32	6	12	CC..0602..	A1	B1	321103 0010	119,-	321104 0010	119,-
AH 1012 J SCLC R/L 06	10	12	125	38	7	14	CC..0602..	A1	B1	321103 0012	125,-	321104 0012	125,-
AH 1216 M SCLC R/L 06	12	16	150	50	9	18	CC..0602..	A1	B1	321103 0016	160,-	321104 0016	160,-
										3104		3104	

### Set

Contents			Right-hand art.no.	€	Left-hand art.no.	€
1x AH0608H SCLCR/L 06   1x AH0810J SCLCR/L 06   1x AH1012K SCLCR/L 06   1x AH1216M SCLCR/L 06	A1	B1	321103 1004	399,-	321104 1004	399,-
			3104		3104	

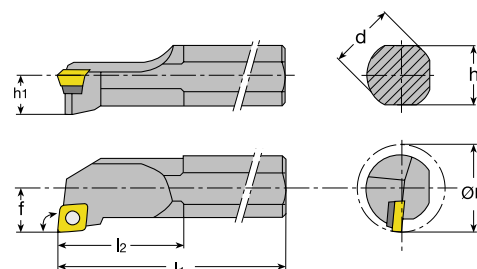
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 320901 2513	11,65		B1 703053 0080	1,93	
	3164			7114	

## ATORN® SCLC solid carbide boring bars



- **SCLC R/L 95°**
- 95° setting angle
- For rhombic indexable inserts, 7° positive, 80° point angle
- **Internal coolant supply**
- Low-vibration
- **Use:** Longitudinal turning



### Boring bar, individual

ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts				Right-hand art.no.	€	Left-hand art.no.	€	
E08K-SCLC R/L 06	8	7	3.5	125	10	5	10	CC..0602..	A1			D1	321101 0108	201,-	321102 0108	201,-
E10K-SCLC R/L 06	10	9	4.5	125	10	6	12	CC..0602..	A1			D1	321101 0110	201,-	321102 0110	201,-
E12M-SCLC R/L 06	12	11	5.5	150	10	8	14	CC..0602..	A1			D1	321101 0112	233,-	321102 0112	233,-
E16R-SCLC R/L 09	16	15	7.0	200	16	10	18	CC..09T3..	A2			D2	321101 0116	390,-	321102 0116	390,-
E20S-SCLC R/L 09	20	18	9.0	250	16	12	23	CC..09T3..	A2			D2	321101 0120	699,-	321102 0120	699,-
E25S-SCLC R/L 12	25	23	11.5	250	16	15	30	CC..1204..	A3	B1	C1	D3	321101 0125	1.389,-	321102 0125	1.389,-
												3104		3104		

### Set

Contents			Right-hand art.no.	€	Left-hand art.no.	€
1x E08K SCLCR/L 06   1x E10K SCLCR/L 06   1x E12M SCLCR/L 06	A1	D1	321101 0003	519,-	321102 0003	519,-
			3104		3104	

### Spare parts

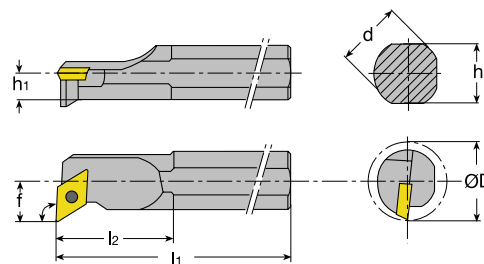
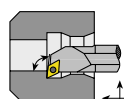
Screw			Support plate			Screw			TORX		
art.no.	€		art.no.	€		art.no.	€		art.no.	€	
A1 320901 2513	11,65		B1 321611 0001	32,60		C1 321611 0012	12,10		D1 703053 0080	1,93	
A2 320901 2516	9,75								D2 703053 0150	1,93	
A3 321701 0108	9,75								D3 703053 0200	1,93	
	3164			3164			3106			7114	





## ATORN® Boring bar, positive SDUC



- **SDUC R/L 93°**
- Setting angle 93°, for positive 7° rhombic indexable inserts, 55° point angle
- **Use:** Longitudinal turning



### Standard version with internal cooling

ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 10 H SDUC R/L 07	10	9.5	4.5	125	15	7	13.5	DC..0702..	A1	B1	<b>321008</b> 0110	100,50	<b>321009</b> 0110	100,50
A 12 L SDUC R/L 07	12	11	5.5	140	20	9	16	DC..0702..	A1	B1	321008 0112	104,-	321009 0112	104,-
A 16 Q SDUC R/L 07	16	14	7	180	27	11	20	DC..0702..	A1	B1	321008 0116	111,50	321009 0116	111,50
A 20 R SDUC R/L 11	20	18	9	200	33.8	13	25	DC..11T3..	A2	B2	321008 0120	116,50	321009 0120	116,50
A 25 R SDUC R/L 11	25	23	11.5	200	35.8	17	32	DC..11T3..	A2	B2	321008 0125	140,50	321009 0125	140,50
											3104		3104	

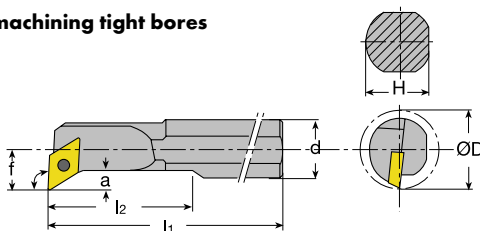
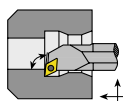
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 320901 2513	11,65		B1 703053 0080	1,93	
A2 320901 2516	9,75		B2 703053 0150	1,93	
3164			7114		



## ATORN® Boring bars, positive SDUC





- **SDUC R/L 93°**
- Setting angle 93°, for positive 7° rhombic indexable inserts, 55° point angle
- **With internal cooling**
- **Use:** Longitudinal turning, **very well suited to machining tight bores**



### Boring bar, individual

ISO designation	d mm	H mm	l1 mm	l2 mm	f mm	a mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A0408F SDUC R/L 04	8	7	80	15	3	1.5	5.6	DC..04T0..	A2	B1	<b>321013</b> 0008	94,60	<b>321014</b> 0408	94,60
A 0810 H SDUC R/L 07	10	9	100	22.5	6.5	4.4	12.5	DC..0702..	A1	B2	321013 0010	97,70	321014 0010	97,70
A 1012 H SDUC R/L 07	12	11	125	27.5	9	5.9	15.5	DC..0702..	A1	B2	321013 0012	102,-	321014 0012	102,-
A 1216 R/L SDUC R/L 07	16	15	150	40.5	11	4.9	18	DC..0702..	A1	B2	321013 0016	109,50	321014 0016	109,50
											3104		3104	

### Set

Contents				Right-hand art.no.	€	Left-hand art.no.	€
1x A0810H SDUCR/L 07   1x A1012K SDUCR/L 07   1x A1216M SDUCR/L 07		A1	B2	<b>321013</b> 1003	244,-	<b>321014</b> 1003	244,-
				3104		3104	

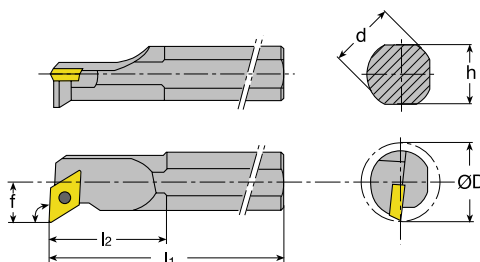
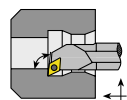
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 320901 2513	11,65		B1 703053 0050	1,93	
A2 322201 0130	7,15		B2 703053 0080	1,93	
3164			7114		

## ATORN® SDUC HSS boring bars, positive



- **SDUC R/L 93°**
- Setting angle 93°, for positive 7° rhombic indexable inserts, 55° point angle
- **With internal cooling**
- **Use:** Longitudinal turning, very well suited to machining tight bores
- Low-vibration boring bars
- Indexable inserts with longer service life
- HSS boring bars with longer service life



### Boring bar, individual

ISO designation	d1 mm	d mm	h mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€	
AH 0810 H SDUC R/L 07	8	10	9	100	22	7	12.5	DC..0702..	A1	B1	321113 0010	133,-	321114 0010	133,-	
AH 1012 K SDUC R/L 07	10	12	11	125	28	9	15.5	DC..0702..	A1	B1	321113 0012	146,-	321114 0012	146,-	
AH 1216 M SDUC R/L 07	12	16	15	150	36	11	19.5	DC..0702..	A1	B1	321113 0016	165,50	321114 0016	165,50	
												3104		3104	

### Set

Contents				Right-hand art.no.	€	Left-hand art.no.	€
1x AH0810H SDUCR/L 07   1x AH1012K SDUCR/L 07   1x AH1216M SDUCR/L 07		A1	B1	321113 1003	335,-	321114 1003	335,-
				3104		3104	

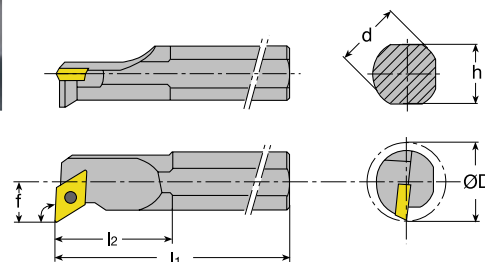
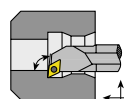
### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 320901 2513	11,65		B1 703053 0080	1,93	
3164			7114		

## ATORN® SDUC solid carbide boring bars



- **SDUC R/L 93°**
- 93° setting angle
- For rhombic indexable inserts, 7° positive, 55° point angle
- **Internal coolant supply**
- Low-vibration
- **Use:** Longitudinal turning



### Boring bar, individual

ISO designation	d mm	h mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€		
E08K-SDUC R/L 07	8	7	125	10.0	7.5	12.5	DC..0702..	A1	B1	321108 0108	162,-	321109 0108	162,-		
E10K-SDUC R/L 07	10	9	125	10.0	7	12.5	DC..0702..	A1	B1	321108 0110	172,-	321109 0110	172,-		
E12M-SDUC R/L 07	12	11	150	12.5	9	15	DC..0702..	A1	B1	321108 0112	201,-	321109 0112	201,-		
E16R-SDUC R/L 07	16	15	200	16.5	11	19	DC..0702..	A1	B1	321108 0116	380,-	321109 0116	380,-		
E20S-SDUC R/L 11	20	18	250	20.5	12.5	23.5	DC..11T3..	A2	B2	321108 0120	789,-	321109 0120	789,-		
E25S-SDUC R/L 11	25	23	250	26.0	16	32	DC..11T3..	A2	B2	321108 0125	1.329,-	321109 0125	1.329,-		
												3104		3104	

### Set

Contents				Right-hand art.no.	€	Left-hand art.no.	€
1x E10K SDUCR/L 07   1x E12M SDUCR/L 07		A1	B1	321108 0002	370,-	321109 0002	370,-
				3104		3104	

### Spare parts

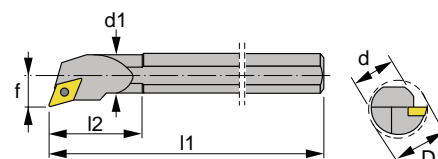
Screw			TORX		
art.no.	€		art.no.	€	
A1 320901 2513	11,65		B1 703053 0080	1,93	
A2 320901 2516	9,75		B2 703053 0150	1,93	
3164			7114		



## ATORN® Boring bar, positive SDQC



- **SDQC R/L 107.5°**
- Setting angle 107.5°, for rhombic indexable inserts, positive 7°, 55° point angle
- **With internal cooling**
- **Material:** Longitudinal turning



### Boring bar, individual, offset with internal cooling

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 0810 H SDQC R/L 07	8	10	100	22.4	6.4	12.5	DC..0702..	A1	D1	<b>322545</b> 0810	<b>97,70</b>	<b>322546</b> 0810	<b>97,70</b>
A 1012 K SDQC R/L 07	10	12	125	27.5	9	15.5	DC..0702..	A1	D1	322545 1012	102,-	322546 1012	102,-
A 1216 M SDQC R/L 07	12	16	150	39.5	11	19.5	DC..0702..	A1	D1	322545 1216	109,50	322546 1216	109,50
										3104		3104	



### Boring bar, with internal cooling

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts				Right-hand art.no.	€	Left-hand art.no.	€	
A10K SDQC 07	10	125	16	7	14	DC..0702..	A1		D1	<b>322545</b> 0010	<b>100,50</b>	<b>322546</b> 0010	<b>100,50</b>	
A 12 L SDQC R/L 07	12	140	20	9	17	DC..0702..	A1		D1	322545 0012	104,-	322546 0012	104,-	
A 16 Q SDQC R/L 07	16	180	25	11	22	DC..0702..	A1		D1	322545 0016	111,50	322546 0016	111,50	
A 20 R SDQC R/L 11	20	200	32	13	26	DC..11T3..	A2		D2	322545 0020	116,50	322546 0020	116,50	
A 25 R SDQC R/L 11	25	200	40	17	31.5	DC..11T3..	A2		D2	322545 0025	140,50	322546 0025	140,50	
A 32 S SDQC R/L 11	32	250	33.5	22	40	DC..11T3..	A3	B1	C1	D2	322545 0032	180,50	322546 0032	180,50
										3104		3104		

### Solid carbide boring bar, individual, with internal cooling

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E10K-SDQC R/L 07	10	125	10	7	13	DC..0702..	A1	D1	<b>322547</b> 0010	<b>168,50</b>	<b>322548</b> 0010	<b>168,50</b>
E12M-SDQC R/L 07	12	150	12.5	8.5	16	DC..0702..	A1	D1	322547 0012	201,-	322548 0012	201,-
E16R-SDQC R/L 07	16	200	16.5	10	20	DC..0702..	A1	D1	322547 0016	380,-	322548 0016	380,-
E20S-SDQC R/L 11	20	250	13	12.5	25	DC..11T3..	A2	D2	322547 0020	679,-	322548 0020	679,-
E25S-SDQC R/L 11	25	250	17	16	32	DC..11T3..	A2	D2	322547 0025	1.329,-	322548 0025	1.329,-
									3104		3104	



### Set with internal cooling

ISO designation	Contents			Right-hand art.no.	€	Left-hand art.no.	€
SDQC L07	1x A0810H SDQCR/L 07   1x A1012K SDQCR/L 07   1x A1216M SDQCR/L 07	A1	D1			<b>322546</b> 1003	<b>254,-</b>
SDQC R07	1x A0810H SDQCR/L 07   1x A1012K SDQCR/L 07   1x A1216M SDQCR/L 07	A1	D1	<b>322545</b> 1003	<b>254,-</b>		
				3104		3104	

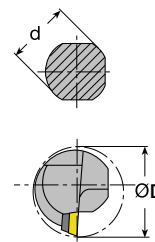
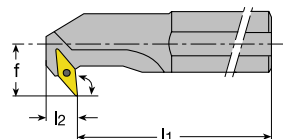
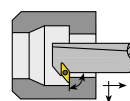
### Spare parts

Screw		Support plate		Screw		TORX	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 320901 2513	11,65	B1 321611 0003	21,60	C1 321611 0013	12,10	D1 703053 0080	1,93
A2 320901 2516	9,75					D2 703053 0150	1,93
A3 321611 0011	7,95						
3164		3164		3106		7114	

## ATORN® Boring bar, positive SDXC



- **SDXC R/L 93°**
- Setting angle 93°, for rhombic indexable inserts, positive 7°, 55° point angle
- **With internal cooling**
- **Material:** Longitudinal turning



ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
									art.no.	€	art.no.	€
A 10H SDXC R/L 04	10	100	22	7	12.5	DC..04T0..	A2	B1	322549 0010	107,50	322550 0010	107,50
A 12L SDXC R/L 07	12	140	25	9	17	DC..0702..	A1	B2	322549 0012	124,50	322550 0012	124,50
A08F SDXC R/L 04	8	80	15	5	9.2	DC..04T0..	A2	B1	322549 0008	104,50	322550 0008	104,50
A16Q SDXC R/L 07	16	180	33	11	21	DC..0702..	A1	B2	322549 0016	128,-	322550 0016	128,-
									3104		3104	

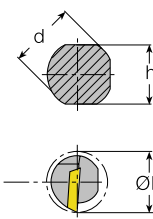
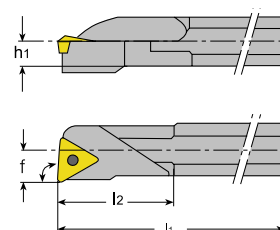
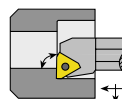
### Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	320901 2513	11,65	B1	703053 0050	1,93
A2	322201 0130	7,15	B2	703053 0080	1,93
	3164			7114	

## ATORN® Boring bar, positive STFC



- **STFC R/L 90°**
- Setting angle 90°, for positive 7° triangular indexable inserts, 60° point angle
- **Use:** Longitudinal turning



### Standard version with internal cooling

ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts					Right-hand		
													art.no.	€	
A 10 K STFC R/L 11	10	9	4.5	125	22.8	7	13	TC..1102..	A1			D1	321005 0110	89,50	
A 12 R STFC R/L 11	12	11	5.5	140	26.5	9	16	TC..1102..	A1			D1	321005 0112	97,20	
A 16 Q STFC R/L 11	16	14	7	180	26.7	11	20	TC..1102..	A1			D1	321005 0116	108,-	
A 20 R STFC R/L 16	20	18	9	200	36.6	13	25	TC..16T3..	A2			D2	321005 0120	129,50	
A 25 R STFC R/L 16	25	23	11.5	200	41	17	32	TC..16T3..	A2			D2	321005 0125	138,-	
A 32 S STFC R/L 16	32	31	16	250	34.6	22	40	TC..16T3..	A3	B1	C1	D2	321005 0132	180,50	
A 40 T STFC R/L 16	40	38.5	20	300	37.5	27	49	TC..16T3..	A3	B1	C1	D2	321005 0140	258,-	
														3104	

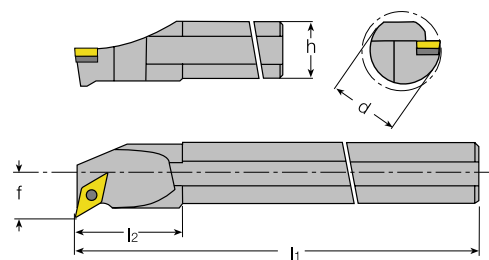
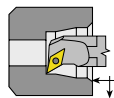
### Spare parts

Screw			Support plate			Screw			TORX		
	art.no.	€		art.no.	€		art.no.	€		art.no.	€
A1	320901 2513	11,65	B1	321611 0004	21,60	C1	321611 0013	12,10	D1	703053 0080	1,93
A2	320901 2516	9,75							D2	703053 0150	1,93
A3	321611 0011	7,95									
	3164			3164			3106			7114	

## ATORN® Boring bar, positive SVUC



- **SVUC R/L 93°**
- Setting angle 93°, for positive 7° rhombic indexable inserts, 35° point angle
- **Internal coolant supply**
- **Use:** Longitudinal and copy turning
- Solid carbide version available on request



ISO designation	d mm	h mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 20 R SVUC R/L 11	20	19	200	20.5	13	25	VC..1103..	A2	B1	<b>321527</b> 0120	174,-	<b>321528</b> 0120	174,-
A 25 R SVUC R/L 16	25	24	200	25.5	17	32	VC..1604..	A1	B2	321527 0125	193,-	321528 0125	193,-
										3104		3104	

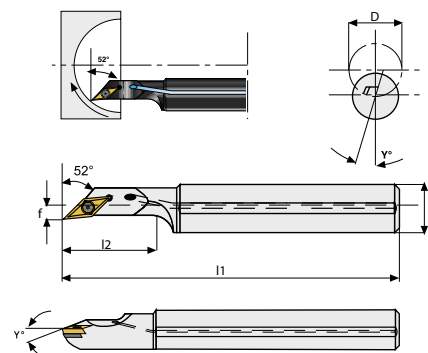
### Spare parts

	Screw		TORX	
	art.no.	€	art.no.	€
A1	320901 2516	9,75	B1 703053 0080	1,93
A2	321701 0102	10,85	B2 703053 0150	1,93
	3164		7114	

## ATORN® Boring bar, positive SVJC



- **SVJC R/L 52°**
- Setting angle 52°, for positive 7° rhombic indexable inserts, 35° point angle
- **Internal coolant supply**
- **Use:** Longitudinal and copy turning, ball turning



ISO designation	d mm	Y mm	l1 mm	l2 mm	f mm	D min. mm	suitable indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 16 M SVJC R/L 11	16	6	150	30	4.6	22	VC..1103...	A1	B1	<b>321529</b> 1116	161,50	<b>321530</b> 1116	161,50
A 20 Q SVJC R/L 11	20	5	180	38	4.6	25	VC..1103...	A1	B1	321529 1120	169,50	321530 1120	169,50
A 25 R SVJC R/L 16	25	4	200	44	4.6	28	VC..1604...	A2	B2	321529 1625	194,-	321530 1625	194,-
										3104		3104	

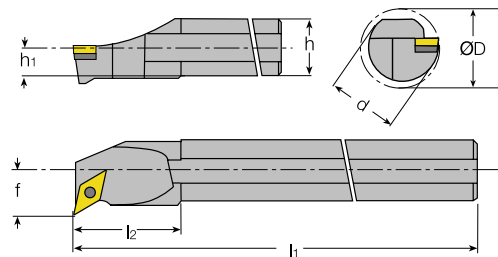
### Spare parts

	Screw		TORX	
	art.no.	€	art.no.	€
A1	320901 2513	11,65	B1 703053 0080	1,93
A2	320901 2516	9,75	B2 703053 0150	1,93
	3164		7114	



## ATORN® Boring bar, positive SVUB

- **SVUB R/L 93°**
- Setting angle 93°, for positive 5° rhombic indexable inserts, 35° point angle
- **Use:** Longitudinal and copy turning



ISO designation	d mm	h mm	h1 mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts	Screw	Spacer	Screw	TORX	Right-hand		Left-hand	
													art.no.	€	art.no.	€
S25T-SVUB..16	25	23	11.5	300	40	17	31	VBM.1604..	A1	B1	C1	D1	321525 1625	172,-	321526 1625	172,-
S32U-SVUB..16	32	30	15	350	50	22	39	VBM.1604..	A1	B1	C1	D1	321525 1632	229,-	321526 1632	229,-
S40V-SVUB..16	40	37	18.5	400	60	27	48	VBM.1604..	A1	B1	C1	D1	321525 1640	265,-	321526 1640	265,-
													3104		3104	

### Spare parts

Screw			Spacer			Screw			TORX		
	art.no.	€		art.no.	€		art.no.	€		art.no.	€
A1	321601 0021	5,05	B1	321601 0027	10,50	C1	321601 0754	3,49	D1	703053 0150	1,93
3106			3164			3164			7114		

**YOUR DRILL**

# GIVES UP.

• **WHAT DO YOU DO? YOU REACH FOR A NEW ONE**

**AND SIMPLY CARRY ON: SARA®GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
 A BRAND OF SARTORIUS WERKZEUGE



## Modular steel boring bars 5xD made of steel

NEW



- Alternative to Monoblock boring bars
- Efficient internal cooling
- Replaceable heads

### Modular steel boring bars 5xD with interface QC

- Maximum projecting length including boring bar head

D mm	L mm	Projecting length mm	F mm	art.no.	€
20	160	max 100	0	<b>321800 0020</b>	152,-
25	205	max. 125	2.5	321800 0025	168,-
32	268	max. 160	6	321800 0032	182,50

3164

### Modular steel boring bars 5xD with interface DM

- Maximum projecting length including boring bar head

D mm	L mm	Projecting length mm	F mm	art.no.	€
40	328	max. 200	0	<b>321800 0040</b>	284,-
50	418	max. 250	5	321800 0050	370,-
60	508	max. 300	10	321800 0060	460,-

3164



## Vibration-dampened modular boring bars

NEW



- Vibration-dampened boring bars for boring bar heads
- Lengths of 6 to 10 x diameter
- Other diameters and lengths available on request

### Interface CC

- Carbide reinforced from 8 x diameter
- We do not recommend shortening the carbide-reinforced version!

D mm	L mm	Projecting length mm	art.no.	€
16	140	96	<b>321815 0001</b>	559,-
16	172	128	321815 0002	849,-
16	204	160	321815 0003	1.069,-

3164

### Interface QC

- Version with carbide-reinforced shank available on request

D mm	L mm	Projecting length mm	F mm	art.no.	€
20	180	90-120		<b>321816 0001</b>	679,-
20	220	105-160		321816 0002	709,-
20	260	120-200		321816 0003	1.399,-
25	230	100-150	2.5	321818 0001	729,-
25	280	120-200	2.5	321818 0002	769,-
25	330	140-250	2.5	321818 0003	1.529,-
32	300	120-192	6	321820 0001	819,-
32	364	142-256	6	321820 0002	869,-
32	428	165-320	6	321820 0003	1.679,-

3164

### Interface DM

- Version with carbide-reinforced shank available on request

D mm	L mm	Projecting length mm	F mm	art.no.	€
40	368	160-240		<b>321822 0001</b>	879,-
40	448	180-320		321822 0002	949,-
40	528	200-400		321822 0003	1.939,-
50	468	185-300	5	321824 0001	1.059,-
50	568	215-400	5	321824 0002	1.119,-
50	668	245-500	5	321824 0003	2.289,-
60	568	214-360	10	321826 0001	1.379,-
60	688	247-480	10	321826 0002	1.459,-
60	808	280-600	10	321826 0003	3.049,-

3164





## Boring bar heads for modular boring bars

NEW





## • Boring bar heads with interface CC

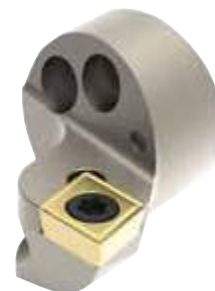
- Note: System CC boring bar heads can be combined with all System CC boring bars.

Technical information  
on page 1085



**A16-SCLCR/L 95° interface CC**

- Interchangeable drill heads for positive rhombic 80° indexable cutting inserts

Designation	D1 min. mm	L mm	f mm	suitable indexable inserts			Right-hand		Left-hand	
							art.no.	€	art.no.	€
A16-SCLC.. 06	20	20	10	CC.. 0602..	A1	B1	<b>321900</b> 0001	121,50	<b>321901</b> 0001	121,50
							3164		3164	



**A16-SDUCR/L 93° interface CC**

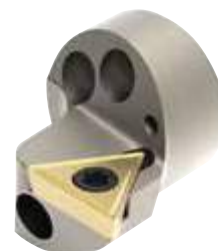
- Interchangeable drill heads for positive rhombic 55° indexable cutting inserts



Designation	D1 min. mm	L mm	f mm	suitable indexable inserts			Right-hand		Left-hand	
							art.no.	€	art.no.	€
A16-SDUC.. 07	20	20	10	DC.. 0702..	A1	B1	<b>321902</b> 0001	121,50	<b>321903</b> 0001	121,50
							3164		3164	

**A16-STUCR/L 93° interface CC**

- Interchangeable drill heads for positive triangular 60° indexable cutting inserts

Designation	D1 min. mm	L mm	f mm	suitable indexable inserts			Right-hand		Left-hand	
							art.no.	€	art.no.	€
A16-STUC.. 11	20	20	10	TC.. 1102..	A1	B1	<b>321904</b> 0001	121,50	<b>321905</b> 0001	121,50
							3164		3164	

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
	A1 321601 0600	6,65		B1 703053 0080	1,93
	3164			7114	

Over 200,000 tools available online!

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

[www.saratools.com](http://www.saratools.com)



## Boring bar heads for modular boring bars

NEW





## • Boring bar heads with interface QC

• Note: System QC boring bar heads can be combined with all System QC boring bars.



Technical information  
on page 1085**A20-SCLCR/L 95°**

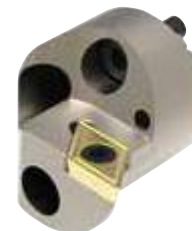
• Interchangeable drill heads for positive rhombic 80° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts			Right-hand		Left-hand	
						art.no.	€	art.no.	€
A20-SCLC.. 09	20.5	12.95	CC.. 09T3..	A2	B2	321908 0001	137,50	321909 0001	137,50
						3164		3164	



**A20-SDUCR/L 93°**

• Interchangeable drill heads for positive rhombic 55° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts			Right-hand		Left-hand	
						art.no.	€	art.no.	€
A20-SDUC.. 07	20.5	12.95	DC.. 0702..	A1	B1	321914 0001	137,50	321915 0001	137,50
A20-SDUC.. 11	20.5	14.95	DC.. 11T3..	A2	B2	321914 0002	137,50	321915 0002	137,50
						3164		3164	



**A20-SDQCR/L 107,5°**

• Interchangeable drill heads for positive rhombic 55° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts			Right-hand		Left-hand	
						art.no.	€	art.no.	€
A20-SDQC.. 07	20.5	12.95	DC.. 0702..	A1	B1	321910 0001	137,50	321911 0001	137,50
A20-SDQC.. 11	22.5	14.95	DC.. 11T3..	A2	B2	321910 0002	137,50	321911 0002	137,50
						3164		3164	



**A20-STUCR/L 93°**

• Interchangeable drill heads for positive triangular 60° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts			Right-hand		Left-hand	
						art.no.	€	art.no.	€
A20-STUC.. 11	20.5	12.95	TC.. 1102..	A2	B2	321918 0001	137,50	321919 0001	137,50
A20-STUC.. 11	20.5	11	TC.. 1102..	A2	B2	321918 0002	137,50	321919 0002	137,50
A20-STUC.. 16	21	14.95	TC.. 16T3..	A2	B2	321918 0003	137,50	321919 0003	137,50
						3164		3164	



**A20-SVUCR/L 93°**

• Interchangeable drill heads for positive rhombic 35° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts			Right-hand		Left-hand	
						art.no.	€	art.no.	€
A20-SVUC.. 11	20.5	15.95	VC.. 1103..	A1	B1	321920 0001	137,50	321921 0001	137,50
						3164		3164	



**A20-SIR/L 90°**

• Interchangeable drill heads for threading inserts

Designation	L mm	f mm			Right-hand		Left-hand		
					art.no.	€	art.no.	€	
A20-SI.. 16	21.65	14.95	A2	B2	321922 0001	137,50	321923 0001	137,50	
						3164		3164	



## Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
	A1 321601 0600	6,65		B1 703053 0080	1,93
	A2 321601 0601	6,65		B2 703053 0150	1,93
	3164			7114	



## Boring bar heads for modular boring bars

NEW



## • Boring bar heads with interface DM

- Note: System DM boring bar heads can be combined with all System DM boring bars.

Technical information  
on page 1085

**A40-SCLCR/L 95°**

- Interchangeable drill heads for positive rhombic 80° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts	Inserts						Right-hand		Left-hand	
				A2	C5	D1	Q2	R3	art.no.	€	art.no.	€	
A40-SCLC.. 12	32	27	CC.. 1204..	A2	C5	D1	Q2	R3	<b>321936</b> 0001	188,50	<b>321937</b> 0001	188,50	
									3164		3164		

**A40-SDUCR/L 93°**

- Interchangeable drill heads for positive rhombic 55° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts	Inserts						Right-hand		Left-hand	
				A3	C6	E2	Q2	R3	art.no.	€	art.no.	€	
A40-SDUC.. 11	32	27	DC.. 11T3..	A3	C6	E2	Q2	R3	<b>321938</b> 0001	188,50	<b>321939</b> 0001	188,50	
A40-SDUC.. 15	32	27	DC.. 1504..	A2	C6	E1	Q2	R3	321938 0002	188,50	321939 0002	188,50	
									3164		3164		

**A40-SDQCR/L 107,5°**

- Interchangeable drill heads for positive rhombic 55° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts	Inserts						Right-hand		Left-hand	
				A3	C6	E2	Q2	R3	art.no.	€	art.no.	€	
A40-SDQC.. 11	32	27	DC.. 11T3..	A3	C6	E2	Q2	R3	<b>321940</b> 0001	188,50	<b>321941</b> 0001	188,50	
									3164		3164		

**A40-STUCR/L 93°**

- Interchangeable drill heads for positive triangular 60° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts	Inserts						Right-hand		Left-hand	
				A3	C6	F1	Q2	R3	art.no.	€	art.no.	€	
A40-STUC.. 16	32	27	TC.. 16T3..	A3	C6	F1	Q2	R3	<b>321942</b> 0001	188,50	<b>321943</b> 0001	188,50	
A40-STUC.. 16	32	22	TC.. 16T3..	A3	C6	F1	Q2	R3	321942 0002	188,50	321943 0002	188,50	
									3164		3164		

**A40-SVUCR/L**

- Interchangeable drill heads for positive rhombic 35° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts	Inserts						Right-hand		Left-hand	
				A1	C6	G1	Q2	R3	art.no.	€	art.no.	€	
A40-SVUC.. 11	32	27	VC.. 1103..	A1				R1	<b>321944</b> 0001	188,50	<b>321945</b> 0001	188,50	
A40-SVUC.. 16	32	27	VC.. 1604..	A3	C6	G1	Q2	R3	321944 0002	188,50	321945 0002	188,50	
									3164		3164		

**A40-DCLNR/L 95°**

- Interchangeable drill heads for negative rhombic 80° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts	Inserts						Right-hand		Left-hand		
				B1	C1	D1	I1	P1	Q1	R2	art.no.	€	art.no.	€
A40-DCLNR 12	35	27	CN.. 1204..	B1	C1	D1	I1	P1	Q1	R2	<b>321924</b> 0001	203,-		
A40-DCLNR 12	35	27	CN.. 1204..	B2	C1	D1	I1	P1	Q1	R2			<b>321925</b> 0001	203,-
A40-DCLNR 16	35	27	CN.. 1604..	B3	C2	D2	I1	P1	Q1		321924 0002	223,-		
A40-DCLNR 16	35	27	CN.. 1604..	B4	C2	D2	I1	P1	Q1				321925 0002	223,-
											3164		3164	

**A40-DDUNR/L 93°**


- Interchangeable drill heads for negative rhombic 55° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts	Inserts						Right-hand		Left-hand		
				B7	C1	E1	I1	P1	Q1 <th>R2</th> <th>art.no.</th> <th>€</th> <th>art.no.</th> <th>€</th>	R2	art.no.	€	art.no.	€
A40-DDUN-R 15	35	27	DN.. 1506..	B7	C1	E1	I1	P1	Q1	R2	<b>321926</b> 0001	203,-		
A40-DDUN-L 15	35	27	DN.. 1506..	B7	C1	E1	I1	P1	Q1	R2			<b>321927</b> 0001	203,-
											3164		3164	

Continued on next page &gt;&gt;&gt;

**A40-DDQNR/L 107,5°**


• Interchangeable drill heads for negative rhombic 55° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts									Right-hand		Left-hand	
				art.no.	€	art.no.	€	art.no.	€						
A40-DDQN-R 15	35	27	DN.. 1506..	B5	C1	E1	I1	P1	Q1	R2	321928 0001	203,-			
A40-DDQN-L 15	35	27	DN.. 1506..	B6	C1	E1	I1	P1	Q1	R2			321929 0001	203,-	
											3164		3164		



**A40-DTUNR/L 93°**


• Interchangeable drill heads for negative triangular 60° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts									Right-hand		Left-hand	
				art.no.	€	art.no.	€	art.no.	€						
A40-DTUN-R 16	35	27	TN.. 1604..	B8	C3	F1	I1	P1	Q1	R1	321930 0001	203,-			
A40-DTUN-L 16	35	27	TN.. 1604..	B9	C3	F1	I1	P1	Q1	R1			321931 0001	203,-	
A40-DTUN-R 16	35	22	TN.. 1604..	B8	C3	F1	I1	P1	Q1	R1	321930 0002	203,-			
A40-DTUN-L 16	35	22	TN.. 1604..	B9	C3	F1	I1	P1	Q1	R1			321931 0002	203,-	
A40-DTUN-R 22	35	27	TN.. 2204..	B1	C1	F2	I1	P1	Q1	R2	321930 0003	203,-			
A40-DTUN-L 22	35	27	TN.. 2204..	B2	C1	F2	I1	P1	Q1	R2			321931 0003	203,-	
											3164		3164		



**A40-DVUNR/L 93°**


• Interchangeable drill heads for negative rhombic 35° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts									Right-hand		Left-hand	
				art.no.	€	art.no.	€	art.no.	€						
A40-DVUN-R 16	35	27	VN.. 1604..	B10	C3	G1	I1	P1	Q1	R3	321932 0001	203,-			
A40-DVUN-L 16	35	27	VN.. 1604..	B11	C3	G1	I1	P1	Q1	R3			321933 0001	203,-	
											3164		3164		



**A40-DWLNRL 95°**

• Interchangeable drill heads for negative trigonometric 80° indexable cutting inserts

Designation	L mm	f mm	suitable indexable inserts									Right-hand		Left-hand	
				art.no.	€	art.no.	€	art.no.	€						
A40-DWLN-R 08	35	27	WN.. 0804..	B1	C4	H1	I1	P1	Q1	R2	321934 0001	203,-			
A40-DWLN-L 08	35	27	WN.. 0804..	B2	C4	H1	I1	P1	Q1	R2			321935 0001	203,-	
											3164		3164		



**Spare parts**

Screw		Clamping claw with internal cooling		Screw		Support plate		Support plate		Support plate		Spacer	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	321601 0600 6,65	B1	321601 0604 21,40	C1	321601 0606 7,15	D1	321601 0607 7,65	E1	321601 0616 10,70	F1	321601 0623 10,70	G1	321601 0627 10,70
A2	321601 0632 6,65	B2	321601 0605 21,40	C2	321601 0612 7,15	D2	321601 0613 7,65	E2	321601 0634 10,70	F2	321601 0626 10,70		
A3	321601 0636 6,65	B3	321601 0610 21,40	C3	321601 0622 7,15								
		B4	321601 0611 21,40	C4	321601 0630 7,15								
		B5	321601 0614 21,40	C5	321601 0633 7,15								
		B6	321601 0615 21,40	C6	321601 0635 7,15								
		B7	321601 0617 21,40										
		B8	321601 0624 21,40										
		B9	321601 0625 21,40										
		B10	321601 0628 21,40										
		B11	321601 0629 21,40										
3164		3164		3164		3164		3164		3164		3164	
Support plate		Screw		Sealing ring set		Nickel-plated		TORX					
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€				
H1	321601 0631 10,70	I1	341450 0008 10,70	P1	341450 0009 10,70	Q1	703005 0030 0,39	R1	703053 0080 1,93				
						Q2	703005 0040 0,52	R2	703053 0100 1,93				
								R3	703053 0150 1,93				
3164		3164		3164		7111		7114					

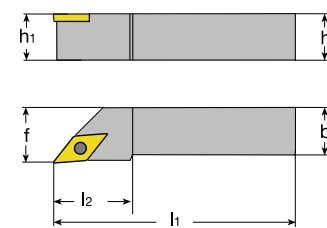
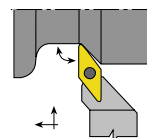
# ATORN® Miniature turning range with indexable cutting inserts, positive

## Clamp mounting, positive SVGC

### • SVGC R/L 90°

- Setting angle 90°, for rhombic indexable inserts positive 7°, 35° point angle

- **Material:** Longitudinal turning



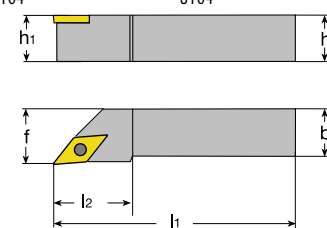
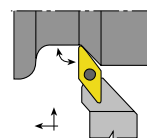
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
SVGC R/L 0808 K07	8	8	125	15	8.5	VC..0702..	A1	D1	322600 0808	70,70	322601 0808	70,70
SVGC R/L 1010 M07	10	10	150	15	10.5	VC..0702..	A1	D1	322600 1010	75,80	322601 1010	75,80
SVGC R/L 1212 M07	12	12	150	18	12.5	VC..0702..	A1	D1	322600 1212	79,90	322601 1212	79,90

## Clamp mounting, positive SVLC

### • SVLC R/L 95°

- Setting angle 95°, for rhombic indexable inserts positive 7°, 35° point angle

- **Material:** Longitudinal turning and facing



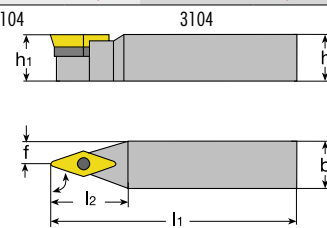
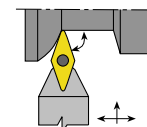
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
SVLC R/L 0808 D07	8	8	60	15	10	VC..0702..	A1	D1	322602 0808	70,70	322603 0808	70,70
SVLC R/L 1010 E07	10	10	70	15	12	VC..0702..	A1	D1	322602 1010	75,80	322603 1010	75,80
SVLC R/L 1212 F07	12	12	80	18	16	VC..0702..	A1	D1	322602 1212	79,90	322603 1212	79,90

## Clamp mounting, positive SVVCN

### • SVVCN 72.5°

- Setting angle 72.5°, for rhombic indexable inserts positive 7°, 35° point angle

- **Material:** Copy turning



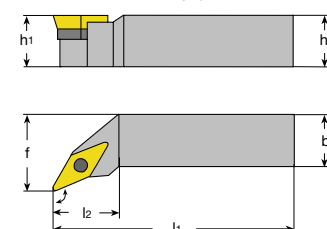
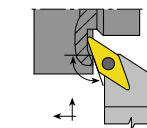
ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts			art.no.	€	
SWC N 0808 K07	8	8	125	15	4.0	VC..0702..	A1	D1	322606 0808	70,70	
SWC N 1010 M07	10	10	150	15	5.0	VC..0702..	A1	D1	322606 1010	75,80	
SWC N 1212 M07	12	12	150	18	6.0	VC..0702..	A1	D1	322606 1207	79,90	
SWC N 1212 F11	12	12	80	18.4	6.0	VC..1103..	A2	D2	322606 1211	88,50	
SWC N 1616 H11	16	16	100	24.7	8.0	VC..1103..	A2	D2	322606 1616	97,20	
SWC N 2020 K11	20	20	125	31.3	10.0	VC..1103..	A2	D2	322606 2011	107,50	
SWC N 2020 K16	20	20	125	31.1	10.0	VC..1604..		B1 C1	D3	322606 2016	107,50
SWC N 2525 M11	25	25	150	39	12.5	VC..1103..	A2		D2	322606 2511	122,-
SWC N 2525 M16	25	25	150	38.2	12.5	VC..1604..		B1 C1	D3	322606 2516	122,-

## Clamp mounting, positive SVXC

### • SVXC R/L 113°

- Setting angle 113°, for rhombic indexable inserts positive 7°, 35° point angle

- **Material:** Longitudinal turning and facing



ISO designation	h=h1 mm	b mm	l1 mm	l2 mm	f mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
SVXC R/L 0808 D07	8	8	60	15	10.0	VC..0702..	A1	D1	322604 0808	70,70	322605 0808	70,70
SVXC R/L 1010 E07	10	10	70	15	12.0	VC..0702..	A1	D1	322604 1010	75,80	322605 1010	75,80
SVXC R/L 1212 F07	12	12	80	18	16.0	VC..0702..	A1	D1	322604 1212	79,90	322605 1212	79,90

## Spare parts

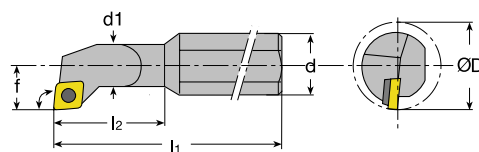
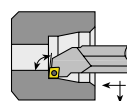
Screw		Screw		Spacer		TORX	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1 262551 0020	7,05	B1 321611 0013	12,10	C1 322201 0210	16,90	D1 703053 0060	1,93
A2 321701 0102	10,85					D2 703053 0080	1,93
						D3 703053 0150	1,93
3106		3106		3164		7114	



## ATORN® Miniature turning range with indexable cutting inserts, positive



- **Application:** for miniature turning from  $\varnothing$  4.8 mm with CD.. - CP.. - WC.. - VC.. Indexable cutting inserts
- Wide range of boring bars in various materials: **steel, HSS, solid carbide**
- **ISO ultra-small indexable cutting inserts** of the latest generation

Miniature turning range with indexable cutting inserts





### Boring bar, positive SCLD offset

- **SCLD R/L 95°**
- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 0408H SCLD R/L 04	4	8	100	16	2.4	4.8	CD..0401..	A4	B2	322501 0004	72,80	322502 0004	72,80
A 0508H SCLD R/L 04	5	8	100	20	2.9	5.8	CD..0401..	A4	B2	322501 0005	72,80	322502 0005	72,80
A 0608H SCLD R/L 04	6	8	100	24	3.4	6.8	CD..0401..	A4	B2	322501 0006	72,80	322502 0006	72,80
										3142		3142	



### Boring bar, positive SCLD

- **SCLD R/L 95°**
- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning

ISO designation	d mm	l1 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 04E SCLD R/L 04	4	70	2.4	4.8	CD..0401..	A4	B2	322519 0004	75,80	322520 0004	75,80
A 05E SCLD R/L 04	5	70	2.9	5.8	CD..0401..	A4	B2	322519 0005	75,80	322520 0005	75,80
A 06F SCLD R/L 04	6	80	3.4	6.8	CD..0401..	A4	B2	322519 0006	79,40	322520 0006	79,40
								3142		3142	



### Solid carbide boring bar, positive SCLD offset

- **SCLD R/L 95°**
- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E0408H-SCLD R/L 04	4	8	100	24	2.4	4.8	CD..0401..	A4	B2	322503 0104	165,-	322504 0104	165,-
E0508H-SCLD R/L 04	5	8	100	30	2.9	5.8	CD..0401..	A4	B2	322503 0105	165,-	322504 0105	165,-
E0608H-SCLD R/L 04	6	8	100	36	3.4	6.8	CD..0401..	A4	B2	322503 0106	165,-	322504 0106	165,-
										3142		3142	

### Solid carbide boring bar, positive SCLD

- **SCLD R/L 95°**
- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning

ISO designation	d mm	l1 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E04F-SCLD R/L 04	4	80	2.4	4.8	CD..0401..	A4	B2	322521 0104	132,-	322522 0104	132,-
E05F-SCLD R/L 04	5	80	2.9	5.8	CD..0401..	A4	B2	322521 0105	132,-	322522 0105	132,-
E06G-SCLD R/L 04	6	95	3.4	6.8	CD..0401..	A4	B2	322521 0106	132,-	322522 0106	132,-
								3142		3142	







### Boring bar, positive SCUP offset

#### • SCUP R/L 95°



- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
A 0608H SCUP R/L 05	6	8	100	20	4.5	8	CP..05T1..	A1	B2	<b>322505</b> 0006	<b>72,80</b>	<b>322506</b> 0006	<b>72,80</b>
A 0810J SCUP R/L 05	8	10	110	26	6.0	11	CP..05T1..	A1	B2	322505 0008	<b>74,80</b>	322506 0008	<b>74,80</b>
A 1012K SCUP R/L 05	10	12	125	32	7.0	13	CP..05T1..	A1	B2	322505 0010	<b>78,40</b>	322506 0010	<b>78,40</b>
A 1216M SCUP R/L 05	12	16	150	40	9.0	16	CP..05T1..	A1	B2	322505 0012	<b>89,50</b>	322506 0012	<b>89,50</b>
										3142		3142	

### Solid carbide boring bar, positive SCUP offset

#### • SCLD R/L 95°



- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
E0608H-SCUP R/L 05	6	8	100	28	4.5	8	CP..05T1..	A1	B2	<b>322507</b> 0106	<b>165,-</b>	<b>322508</b> 0106	<b>165,-</b>
E0810J-SCUP R/L 05	8	10	110	36	6.0	11	CP..05T1..	A1	B2	322507 0108	<b>181,-</b>	322508 0108	<b>181,-</b>
E1012K-SCUP R/L 05	10	12	125	44	7.0	13	CP..05T1..	A1	B2	322507 0110	<b>236,-</b>	322508 0110	<b>236,-</b>
E1216M-SCUP R/L 05	12	16	150	55	9.0	16	CP..05T1..	A1	B2	322507 0112	<b>380,-</b>	322508 0112	<b>380,-</b>
										3142		3142	

### Boring bar, positive SCXP offset

#### • SCXP R/L 95°



- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
A 0608H SCXP R/L 05	6	8	100	20	4.5	8.5	CP..05T1..	A1	B2	<b>322509</b> 0006	<b>72,80</b>	<b>322510</b> 0006	<b>72,80</b>
A 0810J SCXP R/L 05	8	10	110	26	6.0	11.0	CP..05T1..	A1	B2	322509 0008	<b>74,80</b>	322510 0008	<b>74,80</b>
A 1012K SCXP R/L 05	10	12	125	32	7.0	13.0	CP..05T1..	A1	B2	322509 0010	<b>78,40</b>	322510 0010	<b>78,40</b>
A 1216M SCXP R/L 05	12	16	150	40	9.0	16.0	CP..05T1..	A1	B2	322509 0012	<b>89,50</b>	322510 0012	<b>89,50</b>
										3142		3142	

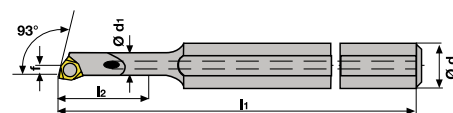
### Solid carbide boring bar, positive SCXP offset

#### • SCXP R/L 95°

- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
E0608H-SCXP R/L 05	6	8	100	28	4.5	8.5	CP..05T1..	A1	B2	<b>322511</b> 0106	<b>165,-</b>	<b>322512</b> 0106	<b>165,-</b>
E0810J-SCXP R/L 05	8	10	110	36	6.0	11.0	CP..05T1..	A1	B2	322511 0108	<b>181,-</b>	322512 0108	<b>181,-</b>
E1012K-SCXP R/L 05	10	12	125	44	7.0	13.0	CP..05T1..	A1	B2	322511 0110	<b>236,-</b>	322512 0110	<b>236,-</b>
E1216M-SCXP R/L 05	12	16	150	55	9.0	16.0	CP..05T1..	A1	B2	322511 0112	<b>380,-</b>	322512 0112	<b>380,-</b>
										3142		3142	

Continued on next page &gt;&gt;&gt;




### Boring bar, positive SWUC offset

#### • SWUC R/L 93°

• Setting angle 93°, for trigonometric indexable inserts positive 7°, 80° point angle

• **Material:** Longitudinal turning



ISO designation	d mm	l1 mm	l2 mm	f mm	d1 mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 0508H SWUC R/L 02	8	100	18	2.9	5	5.8	WC..0201..	A5	B2	322513 0005	90,60	322514 0005	90,60
A 0608H SWUC R/L 02	8	100	24	3.9	6	7.8	WC..0201..	A5	B2	322513 0006	90,60	322514 0006	90,60
										3142		3142	

### HSS boring bar, positive SWUC offset

#### • SWUC R/L 93°

• Setting angle 93°, for trigonometric indexable inserts positive 7°, 80° point angle

• **Material:** Longitudinal turning



ISO designation	d mm	l1 mm	l2 mm	f mm	d1 mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
AH0508H SWUC .02	8	100	18	2.9	5	5.8	WC..0201..	A5	B2	322515 0005	132,50	322516 0005	132,50
AH0608H SWUC .02	8	100	24	3.9	6	7.8	WC..0201..	A5	B2	322515 0006	132,50	322516 0006	132,50
										3142		3142	

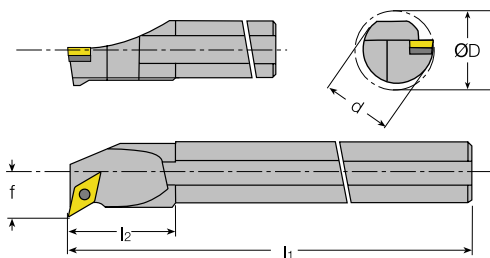
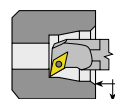
### Solid carbide boring bar, positive SWUC offset

#### • SWUC R/L 93°

• Setting angle 93°, for trigonometric indexable inserts positive 7°, 80° point angle

• **Material:** Longitudinal turning

ISO designation	d mm	l1 mm	l2 mm	f mm	d1 mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E0508H-SWUC R/L 02	8	100	24	2.9	5	5.8	WC..0201..	A5	B2	322517 0105	219,-	322518 0105	219,-
E0608H-SWUC R/L 02	8	100	32	3.9	6	7.8	WC..0201..	A5	B2	322517 0106	219,-	322518 0106	219,-
										3142		3142	





### Boring bar, positive SVLC

#### • SVLC R/L 95°

• Setting angle 95°, for rhombic indexable inserts positive 7°, 35° point angle

• **Material:** Longitudinal turning



ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 08F SVLC R/L 05	8	80	15	5	9.2	VC..0501..	A6	B1	322523 0008	72,80	322524 0008	72,80
A 10H SVLC R/L 07	10	100	22	7	12.5	VC..0702..	A2	B2	322523 0010	72,80	322524 0010	72,80
A 12K SVLC R/L 07	12	125	28	9	15.5	VC..0702..	A2	B2	322523 0012	78,40	322524 0012	78,40
A 16M SVLC R/L 07	16	150	36	11	19.5	VC..0702..	A2	B2	322523 0016	89,50	322524 0016	89,50
									3142		3142	

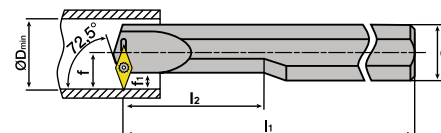
### Solid carbide boring bar, positive SVLC

#### • SVLC R/L 95°

• Setting angle 95°, for rhombic indexable inserts positive 7°, 35° point angle

• **Material:** Longitudinal turning

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E08F-SVLC R/L 05	8	80	26	5	9.2	VC..0501..	A6	B1	322525 0108	177,-	322526 0108	177,-
E10H-SVLC R/L 07	10	100	32	7	12.5	VC..0702..	A2	B2	322525 0110	177,-	322526 0110	177,-
E12K-SVLC R/L 07	12	125	40	9	15.5	VC..0702..	A2	B2	322525 0112	236,-	322526 0112	236,-
E16M-SVLC R/L 07	16	150	55	11	19.5	VC..0702..	A2	B2	322525 0116	395,-	322526 0116	395,-
									3142		3142	



### Boring bar, positive SVVC

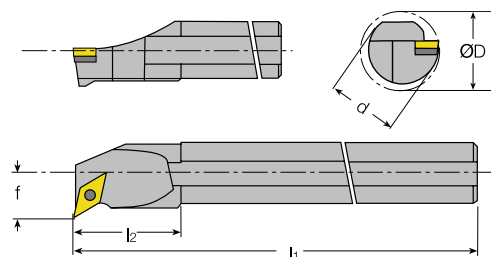
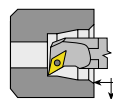
#### • SVVC R/L 72.5°

- Setting angle 72.5°, for rhombic indexable inserts positive 7°, 35° point angle
- **Material:** Longitudinal turning

ISO designation	d mm	l1 mm	l2 mm	f mm	f1 mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
A 08F SVVC R/L 05	8	80	15	5.5	3.5	9.7	VC..0501..	A6	B1	<b>322527</b> 0008	72,80	<b>322528</b> 0008	72,80
A 10H SVVC R/L 07	10	100	28	8	6	13.5	VC..0702..	A2	B2	322527 0010	72,80	322528 0010	72,80
A 12K SVVC R/L 07	12	125	28	9	6	15.5	VC..0702..	A2	B2	322527 0012	78,40	322528 0012	78,40
A 16M SVVC R/L 07	16	150	36	11	6	19.5	VC..0702..	A2	B2	322527 0016	89,50	322528 0016	89,50
A 16M SVVC R/L 11	16	150	40	13.9	9.5	23	VC..1103..	A3	B3	322527 0116	145,-	322528 0116	145,-
										3142		3142	

### Solid carbide boring bar, positive SVVC

ISO designation	d mm	l1 mm	l2 mm	f mm	f1 mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
E08F-SVVC R/L 05	8	80	26	5.5	3.5	9.7	VC..0501..	A6	B1	<b>322529</b> 0008	177,-	<b>322530</b> 0008	177,-
E10H-SVVC R/L 07	10	100	32	8	6	13.5	VC..0702..	A2	B2	322529 0010	177,-	322530 0010	177,-
E12K-SVVC R/L 07	12	125	40	9	6	15.5	VC..0702..	A2	B2	322529 0012	236,-	322530 0012	236,-
E16M-SVVC R/L 07	16	150	55	11	6	19.5	VC..0702..	A2	B2	322529 0016	395,-	322530 0016	395,-
										3142		3142	



### Boring bar, positive SVXC

#### • SVXC R/L 113°

- Setting angle 113°, for rhombic indexable inserts positive 7°, 35° point angle
- **Material:** Longitudinal turning

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand		Left-hand		
									art.no.	€	art.no.	€	
A 08F SVXC R/L 05	8	80	15	5	9.2	VC..0501..	A6	B1	<b>322531</b> 0008	72,80	<b>322532</b> 0008	72,80	
A 10H SVXC R/L 07	10	100	22	7	12.5	VC..0702..	A2	B2	322531 0010	72,80	322532 0010	72,80	
A 12K SVXC R/L 07	12	125	28	9	15.5	VC..0702..	A2	B2	322531 0012	78,40	322532 0012	78,40	
A 16M SVXC R/L 07	16	150	36	11	19.5	VC..0702..	A2	B2	322531 0016	89,50	322532 0016	89,50	
										3142		3142	

### Solid carbide boring bar, positive SVXC

#### • SVXC R/L 113°

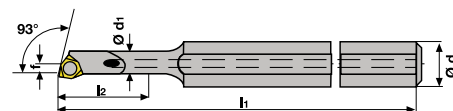
- Setting angle 113°, for rhombic indexable inserts positive 7°, 35° point angle
- **Material:** Longitudinal turning

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand		Left-hand		
									art.no.	€	art.no.	€	
E08F-SVXC R/L 05	8	80	26	5	9.2	VC..0501..	A6	B1	<b>322533</b> 0108	177,-	<b>322534</b> 0108	177,-	
E10H-SVXC R/L 07	10	100	32	7	12.5	VC..0702..	A2	B2	322533 0110	177,-	322534 0110	177,-	
E12K-SVXC R/L 07	12	125	40	9	15.5	VC..0702..	A2	B2	322533 0112	236,-	322534 0112	236,-	
E16M-SVXC R/L 07	16	150	50	11	19.5	VC..0702..	A2	B2	322533 0116	395,-	322534 0116	395,-	
										3142		3142	

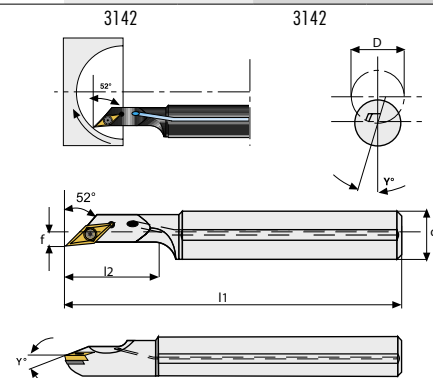
Continued on next page &gt;&gt;&gt;

**Solid carbide boring bar, positive SWUC**

- **SWUC R/L 93°**
- Setting angle 93°, for trigonometric indexable inserts positive 7°, 80° point angle
- **Material:** Longitudinal turning



ISO designation	d mm	l1 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E05F-SWUC R/L 02	5	85	2.9	5.8	WC..0201..	A5	B2	322535 0105	132,-	322536 0105	132,-
E06G-SWUC R/L 02	6	95	3.9	7.8	WC..0201..	A5	B2	322535 0106	132,-	322536 0106	132,-



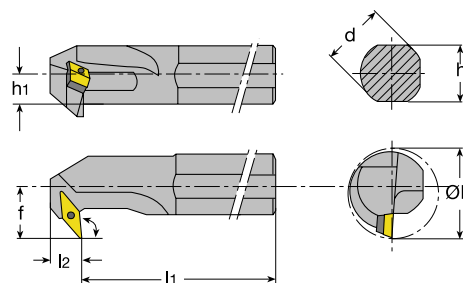
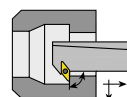
**Boring bar, positive SVJC**

- **SVJC R/L 52°**
- Setting angle 52°, for rhombic indexable inserts positive 7°, 35° point angle
- **Material:** Longitudinal turning and copy turning, sphere turning

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 08F SVJC R/L 05	8	80	15	3	8	VC..0501..	A6	B1	322537 0008	118,-	322538 0008	118,-
A 10K SVJC R/L 07	10	125	18	1.5	13	VC..0702..	A2	B2	322537 0010	123,50	322538 0010	123,50
A 12L SVJC R/L 07	12	140	18	2	13	VC..0702..	A2	B2	322537 0012	128,-	322538 0012	128,-

**Solid carbide boring bar, positive SVJC**

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E08F-SVJC R/L 05	8	80	26	3	8	VC..0501..	A6	B1	322539 0108	194,50	322540 0108	194,50
E10K-SVJC R/L 07	10	125	18	1.5	10	VC..0702..	A2	B2	322539 0110	201,-	322540 0110	201,-
E12M-SVJC R/L 07	12	150	18	2	12	VC..0702..	A2	B2	322539 0112	256,-	322540 0112	256,-



**Boring bar, positive SV95C**

- **SV95C R/L 95°**
- Setting angle 95°, for rhombic indexable inserts positive 7°, 35° point angle
- **Material:** Longitudinal and copy turning, reverse turning

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
A 08F SV95C R/L 05	8	80	15	5	9.2	VC..0501..	A6	B1	322541 0008	72,80	322542 0008	72,80
A 10H SV95C R/L 07	10	100	22	7	12.5	VC..0702..	A2	B2	322541 0010	72,80	322542 0010	72,80
A 12K SV95C R/L 07	12	125	28	9	15.5	VC..0702..	A2	B2	322541 0012	78,40	322542 0012	78,40
A 16M SV95C R/L 07	16	150	36	11	19.5	VC..0702..	A2	B2	322541 0016	89,50	322542 0016	89,50

**Solid carbide boring bar, positive SV95C**

ISO designation	d mm	l1 mm	l2 mm	f mm	B mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E08F-SV95C R/L 05	8	80	26	5	-	9.2	VC..0501..	A6	B1	322543 0108	177,-	322544 0108	177,-
E10H-SV95C R/L 07	10	100	32	7	-	12.5	VC..0702..	A2	B2	322543 0110	177,-	322544 0110	177,-
E12K-SV95C R/L 07	12	125	40	9	-	15.5	VC..0702..	A2	B2	322543 0112	236,-	322544 0112	236,-
E16M-SV95C R/L 07	16	150	55	11	-	19.5	VC..0702..	A2	B2	322543 0116	395,-	322544 0116	395,-

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	152599 0001	7,05	B1	703053 0050	1,93
A2	262551 0020	10,-	B2	703053 0060	1,93
A3	262551 0025	7,15	B3	703053 0080	1,93
A4	321701 0115	10,80			
A5	322201 0120	10,-			
A6	322201 0130	7,15			

3106

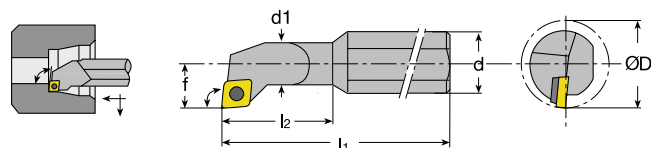
7114

## ATORN® Boring bar, positive SCLC



Figure shows right-hand boring bar, left-hand boring bar is mirror image

- **SCLC R/L 95°**
- Setting angle 95°, for positive 7° rhombic indexable inserts, 80° point angle
- Use: longitudinal turning, **very well suited to small bores**
- **With internal cooling, C04 and C05 without internal coolant supply**
- **D min from 5.00 mm**
- Note: right-hand boring bar = left-hand indexable insert, left-hand boring bar = right-hand indexable insert



### HSS version, offset

ISO designation	d1 mm	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
AH 0410 H SCLC R/L 03	4	10	100	24	2.5	5	CCGT 0301..	A1	B1	<b>321103 0004</b>	176,-	<b>321104 0004</b>	176,-
AH 0610 H SCLC R/L 03	6	10	100	24	2.5	7	CCGT 0301..	A1	B1	<b>321103 0006</b>	180,50	<b>321104 0006</b>	180,50
										3104		3104	

### Solid carbide version

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
C 04 G SCLC R/L 03	4	90	10	2.5	5	CCGT 0301..	A1	B1	<b>321101 0104</b>	222,-	<b>321102 0104</b>	222,-
C 05 H SCLC R/L 03	5	100	10	3.0	6	CCGT 0301..	A1	B1	<b>321101 0105</b>	222,-	<b>321102 0105</b>	222,-
E06J-SCLC R/L 03	6	110	10	3.5	7	CCGT 0301..	A1	B1	<b>321101 0106</b>	235,-	<b>321102 0106</b>	235,-
									3104		3104	

### Suitable ISO P/K indexable inserts

ISO designation	Right-hand art.no.	€	Left-hand art.no.	€
CCGT 030102 LF			10 <b>321265 0165</b>	16,10
CCGT 030102 R-F	10 <b>321266 0165</b>	16,10		
	3110		3110	



### Spare parts

Screw			TORX		
art.no.	€		art.no.	€	
A1 262551 0016	11,45		B1 703053 0060	1,93	
3106			7114		

## ATORN® Miniature boring bars holder

NEW

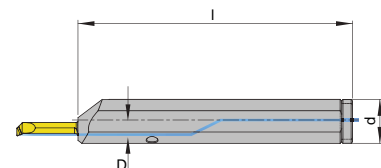
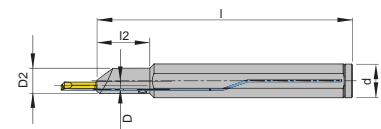
- Miniature turning from Ø 4.8mm
- for CD., CP., DC., WC., and VC.. Indexable cutting inserts
- high flexibility thanks to quick-change system
- **internal coolant supply**
- incl. stop/fixing pin



Design A



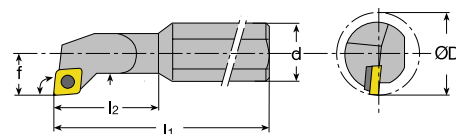
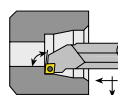
Version B



Designation	D mm	d mm	D2 mm	l1 mm	l2 mm	l1 mm	Design	Right-hand art.no.	€	Left-hand art.no.	€
IK 1604.	4	16	12	120	25		A	<b>322555 1604</b>	251,-	<b>322556 1604</b>	251,-
IK 1606.	6	16	-	120	-		B	<b>322555 1606</b>	251,-	<b>322556 1606</b>	251,-
IK 1608.	8	16	-	120	-		B	<b>322555 1608</b>	251,-	<b>322556 1608</b>	251,-
								3142		3142	

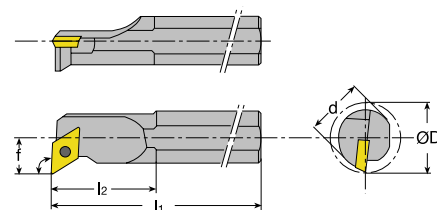
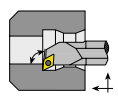
**ATORN® Solid carbide miniature boring bars**

**NEW**



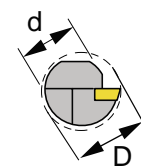
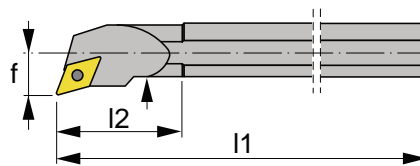
- **SCLD R/L 95°**
- Setting angle 95°, for CD.. indexable inserts positive 7°, 80° point angle
- **Use:** Facing and longitudinal turning

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E04-SCLD R/L 04-AX	4	46	24	2.4	4.8	CD.T 0401..	A1	B2	322560 0004	189,-	322561 0004	189,-
E06-SCLD R/L 04-AX	6	65	37	3.4	6.8	CD.T 0401..	A1	B2	322560 0006	189,-	322561 0006	189,-
									3142		3142	



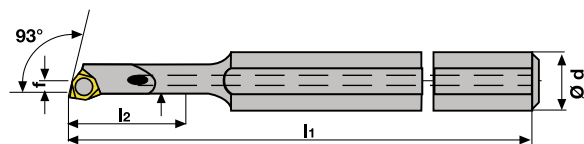
- **SDUC R/L 93°**
- Setting angle 93°, for DC.. indexable inserts positive 7°, 55° point angle
- **Use:** Longitudinal turning and copy turning

ISO designation	d mm	l1 mm	l2 mm	f mm	f1 mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E0406-SDUC R/L 04-AX	6	56	26	3	1.5	5.6	DC.T 04T0..	A2	B1	322564 0406	189,-	322565 0406	189,-
E0408-SDUC R/L 04-AX	8	57	26	3	1.5	5.6	DC.T 04T0..	A2	B1	322564 0408	189,-	322565 0408	189,-
									3142		3142		



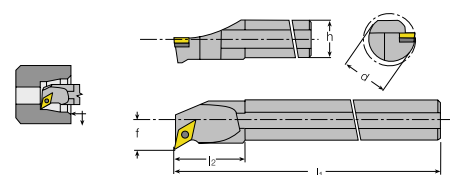
- **SDQC R/L 107.5°**
- Setting angle 93°, for DC.. indexable inserts positive 7°, 107.5° point angle
- **Use:** Longitudinal turning and copy turning

ISO designation	d mm	l1 mm	l2 mm	f mm	f1 mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E0406-SDQC R/L 04-AX	6	56	26	2.6	1.1	5.2	DC.T 04T0..	A2	B1	322566 0406	189,-	322567 0406	189,-
E0408-SDQC R/L 04-AX	8	57	26	2.6	1.1	5.2	DC.T 04T0..	A2	B1	322566 0408	189,-	322567 0408	189,-
									3142		3142		



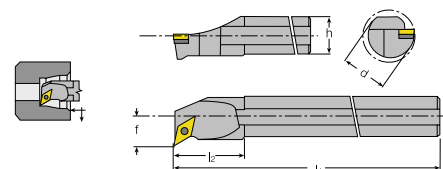
- **SWUC R/L 93°**
- Setting angle 93°, for WC.. indexable inserts positive 7°, 80° point angle
- **Use:** Facing and longitudinal turning

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E06-SWUC R/L 02-AX	6	65	37	3.9	7.8	WC.T 0201..	A3	B2	322562 0006	189,-	322563 0006	189,-
									3142		3142	



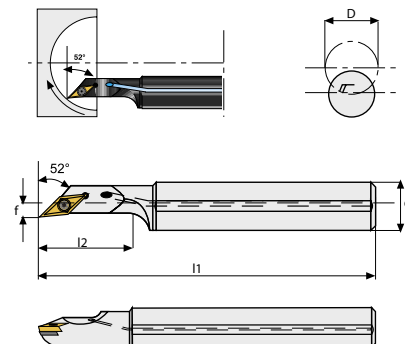
- **SVLC R/L 95°**
- Setting angle 95°, for VC.. indexable inserts positive 7°, 35° point angle
- **Use:** Longitudinal turning and copy turning

ISO designation	d mm	l1 mm	l2 mm	f mm	f1 mm	D min. mm	for indexable inserts			Right-hand art.no.	€	Left-hand art.no.	€
E0406-SVLC R/L 05-AX	6	56	26	6	3	9.2	VC.T 0501..	A2	B1	322568 0406	189,-	322569 0406	189,-
E0408-SVLC R/L 05-AX	8	57	26	5	3	9.2	VC.T 0501..	A2	B1	322568 0408	189,-	322569 0408	189,-
									3142		3142		



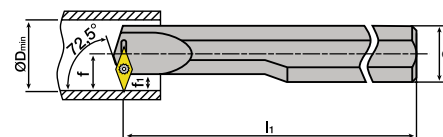
- **SVXC R/L 113°**
- Setting angle 113°, for VC.. indexable inserts positive 7°, 35° point angle
- **Use:** Longitudinal turning and copy turning

ISO designation	d mm	l1 mm	l2 mm	f mm	f1 mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
E0406-SVXC R/L 05-AX	6	56	26	5	3	8.2	VC.T 0501..	A2	B1	322570 0406	189,-	322571 0406	189,-
E0408-SVXC R/L 05-AX	8	57	26	5	3	9.2	VC.T 0501..	A2	B1	322570 0408	189,-	322571 0408	189,-
										3142		3142	



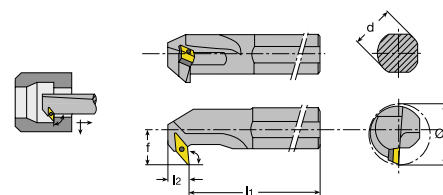
- **SVJC R/L 52°**
- Setting angle 52°, for VC.. indexable inserts positive 7°, 35° point angle
- **Use:** Longitudinal turning and copy turning

ISO designation	d mm	l1 mm	l2 mm	f mm	D min. mm	for indexable inserts			Right-hand		Left-hand		
									art.no.	€	art.no.	€	
E0406 SVJC. 05 AX	6	56	26	2	5.5	VC.T 0501..	A2	B1	322572 0406	189,-	322573 0406	189,-	
E0408 SVJC. 05 AX	8	57	26	2	5.5	VC.T 0501..	A2	B1	322572 0408	189,-	322573 0408	189,-	
										3142		3142	



- **SVVC R/L 72.5°**
- Setting angle 72.5°, for VC.. indexable inserts positive 7°, 35° point angle
- **Use:** Longitudinal turning and copy turning

ISO designation	d mm	l1 mm	l2 mm	f mm	f1 mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
E0406 SVVC. 05 AX	6	56	26	6.5	4.5	10.3	VC.T 0501..	A2	B1	322574 0406	189,-	322575 0406	189,-
E0408 SVVC. 05 AX	8	57	26	5.5	3.5	10.2	VC.T 0501..	A2	B1	322574 0408	189,-	322575 0408	189,-
										3142		3142	



- **SV95C R/L 95°**
- Setting angle 95°, for VC.. indexable inserts positive 7°, 35° point angle
- **Use:** Longitudinal and copy turning, reverse turning

ISO designation	d mm	l1 mm	l2 mm	f mm	f1 mm	D min. mm	for indexable inserts			Right-hand		Left-hand	
										art.no.	€	art.no.	€
E0406 SV95C. 05 AX	6	56	26	6	4.5	9.2	VC.T 0501..	A2	B1	322576 0406	189,-	322577 0406	189,-
E0408 SV95C. 05 AX	8	57	26	5	3	9.2	VC.T 0501..	A2	B1	322576 0408	189,-	322577 0408	189,-
										3142		3142	

**Spare parts**


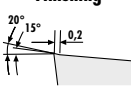
	Screw			TORX	
	art.no.	€		art.no.	€
A1	321701 0115	10,80	B1	703053 0050	1,93
A2	321701 0117	9,55	B2	703053 0060	1,93
A3	322201 0120	10,-			
		3164			
			7114		



## ISO indexable cutting inserts CDGT

• 80° rhombic, positive 7°

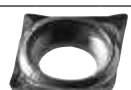
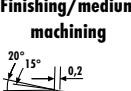
### Chip breaker MN

F finishing	M medium	R roughing	ATORN®						Quality	art.no.	€
●	○	-	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
 <p>Finishing</p> 			ISO designation								
						●			HW 6315	10 369601 0111 16,10	
						●			HW 6315	10 369601 0211 16,10	
						●			HW 6315	10 369601 0411 16,10	

3143

ISO	HW 6315
ISO N Al/non-ferrous	Vc = 160 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.12 ap = 0.1 - 1

### Chip breaker MN

F finishing	M medium	R roughing	ATORN®						Quality	art.no.	€
●	○	-	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
 <p>Finishing/medium machining</p> 			ISO designation								
			●	○	○				HC 7625	10 369607 0212 18,85	
			●	○	○				HC 7625	10 369607 0412 18,85	


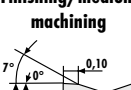
3143

ISO	HC 7625
ISO P steel	Vc = 110 - 190
ISO M stainless steel	Vc = 70 - 90
ISO K cast iron	Vc = 120 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.15 ap = 0.1 - 1

## ISO indexable cutting inserts CPMT

• 80° rhombic, positive 7°

### Chip breaker FP1

F finishing	M medium	R roughing	ATORN®						Quality	art.no.	€
○	○	-	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
 <p>Finishing/medium machining</p> 			ISO designation								
			●	○	○				HC 7625	10 369602 0211 13,15	


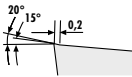
3143

ISO	HC 7625
ISO P steel	Vc = 130 - 220
ISO M stainless steel	Vc = 100 - 160
ISO K cast iron	Vc = 120 - 180
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.15 - 0.4 ap = 0.1 - 1.5

## ISO indexable cutting inserts DCGT

- 55° rhombic, positive 7°


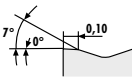
### Chip breaker MN

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	<b>ISO designation</b>				●			<b>HW 6315</b>	10 <b>369607</b> 0311	<b>19,75</b>
 <p><b>Finishing</b></p> 												

3143

ISO	<b>HW 6315</b>
<b>ISO N</b> Al/non-ferrous	Vc = 160 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.02 - 0.15 ap = 0.1 - 1.5

### Chip breaker FP1

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	○	-	<b>ISO designation</b>	●	○	○				<b>HC 7625</b>	10 <b>369608</b> 0312	<b>21,70</b>
 <p><b>Finishing/medium machining</b></p> 												


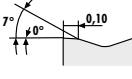
3143

ISO	<b>HC 7625</b>
<b>ISO P</b> steel	Vc = 100 - 190
<b>ISO M</b> stainless steel	Vc = 70 - 90
<b>ISO K</b> cast iron	Vc = 120 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.20 ap = 0.1 - 1.5

## ISO indexable cutting inserts VCGT

- 35° rhombic, positive 7°


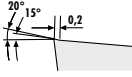
### Chip breaker FP1

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
○	○	-	<b>ISO designation</b>	●	○	○				<b>HC 7625</b>	10 <b>369608</b> 0212	<b>22,10</b>
 <p><b>Finishing</b></p> 												

3143

ISO	<b>HC 7625</b>
<b>ISO P</b> steel	Vc = 100 - 190
<b>ISO M</b> stainless steel	Vc = 70 - 90
<b>ISO K</b> cast iron	Vc = 120 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.5

### Chip breaker MN

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	<b>ISO designation</b>				●			<b>HW 6315</b>	10 <b>369603</b> 0211	<b>20,20</b>
 <p><b>Finishing</b></p> 												
			VCGT 070201-MN				●			<b>HW 6315</b>	10 369603 1111	<b>17,70</b>
			VCGT 070202-MN				●			<b>HW 6315</b>	10 369603 1211	<b>17,70</b>
			VCGT 070204-MN				●			<b>HW 6315</b>	10 369603 1411	<b>17,70</b>



3143

ISO	<b>HW 6315</b>
<b>ISO N</b> Al/non-ferrous	Vc = 160 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.02 - 0.15 ap = 0.1 - 1.5

## ISO indexable cutting inserts VCMT

- 35° rhombic, positive 7°

### Chip breaker FP1

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <b>Finishing</b> 	VCMT 070202-FP1	●	○	○						HC 7625	10 369604 0212	13,15
	VCMT 070204-FP1	●	○	○						HC 7625	10 369604 0412	13,15



3143

ISO	HC 7625
ISO P steel	Vc = 100 - 190
ISO M stainless steel	Vc = 70 - 90
ISO K cast iron	Vc = 120 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.5

## ISO indexable cutting inserts WCGT

- 80° trigonometric, positive 7°

### Chip breaker MN

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <b>Finishing</b> 	WCGT 020101-MN					●				HW 6315	10 369605 0111	18,85
	WCGT 020102-MN					●				HW 6315	10 369605 0211	18,85
	WCGT 020104-MN						●			HW 6315	10 369605 0411	18,85


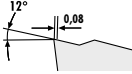
3143

ISO	HW 6315
ISO N Al/non-ferrous	Vc = 160 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.03 - 0.15 ap = 0.1 - 0.8

## ISO indexable cutting inserts WCMT

- 80° trigonometric, positive 7°

### Chip breaker MN Cermet version

F finishing	M medium	R roughing	<b>ATORN®</b>	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	○	-	ISO designation									
 <b>Finishing</b> 	WCMT 020102-MN	●	○	○						HC 7625	10 369606 0212	20,20
	WCMT 020104-MN	●	○	○						HC 7625	10 369606 0412	20,20

3143

ISO	HC 7625
ISO P steel	Vc = 100 - 190
ISO M stainless steel	Vc = 70 - 90
ISO K cast iron	Vc = 120 - 200
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.20 ap = 0.1 - 0.8

## Toolbits

## HSS-E

- **DIN 4964**
- Entire length hardened, tempered and ground true to size on all sides
- **Use:** Turning, boring, grooving etc. and for producing profile steels

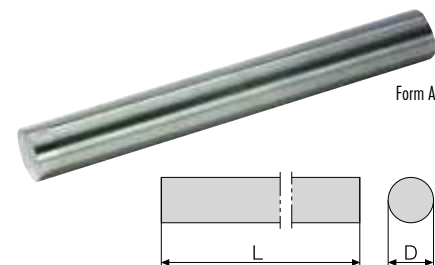
## Type A, round, tolerance h8

D mm	L mm	art.no.	€
4	63	300101 0001	4,62
4	80	300101 0002	5,15
4	100	300101 0003	6,05
5	63	300101 0004	4,62
5	80	300101 0005	5,80
5	100	300101 0006	6,65
5	125	300101 0007	8,05
6	40	300101 0008	5,05
6	63	300101 0009	6,05
6	80	300101 0010	6,65
6	100	300101 0011	7,65
6	125	300101 0012	9,10
6	160	300101 0013	11,45
8	40	300101 0014	6,05
8	63	300101 0015	7,25
8	80	300101 0016	8,60
8	100	300101 0017	9,90
8	125	300101 0018	12,50
8	160	300101 0019	15,90
8	200	300101 0020	19,25
10	63	300101 0022	9,50

3101

D mm	L mm	art.no.	€
10	80	300101 0023	11,05
10	100	300101 0024	12,75
10	125	300101 0025	15,50
10	160	300101 0026	18,75
10	200	300101 0027	23,70
12	63	300101 0028	12,50
12	80	300101 0029	14,50
12	100	300101 0030	16,90
12	125	300101 0031	21,30
12	160	300101 0032	26,-
12	200	300101 0033	31,30
14	160	300101 0034	34,20
16	125	300101 0035	34,-
16	160	300101 0036	43,30
16	200	300101 0037	52,40
18	160	300101 0038	48,10
18	200	300101 0039	60,10
20	125	300101 0040	48,30
20	160	300101 0041	59,-
20	200	300101 0042	74,30

3101



Form A

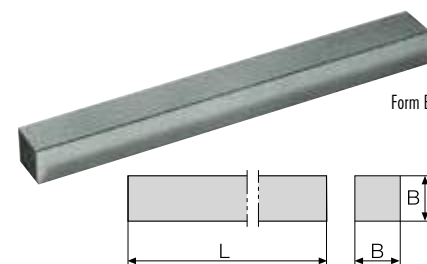
## Type B, square, tolerance h13

B mm	L mm	art.no.	€
4	40	300110 0001	5,05
4	63	300110 0002	6,30
4	80	300110 0003	6,95
4	100	300110 0004	9,10
5	40	300110 0005	5,05
5	63	300110 0006	6,30
5	100	300110 0007	8,25
6	40	300110 0008	4,84
6	63	300110 0009	5,70
6	80	300110 0010	6,20
6	100	300110 0011	6,95
6	125	300110 0012	9,75
6	160	300110 0013	11,25
8	40	300110 0014	8,25
8	63	300110 0015	9,10
8	80	300110 0016	10,05
8	100	300110 0017	11,75
8	125	300110 0018	13,30
8	160	300110 0019	16,10
8	200	300110 0020	18,75
10	63	300110 0021	11,65
10	80	300110 0022	12,95
10	100	300110 0023	16,10
10	125	300110 0024	17,90

3101

B mm	L mm	art.no.	€
10	160	300110 0025	22,90
10	200	300110 0026	28,10
12	63	300110 0027	15,30
12	80	300110 0028	17,10
12	100	300110 0029	20,10
12	125	300110 0030	24,40
12	160	300110 0031	31,-
12	200	300110 0032	37,30
14	100	300110 0033	25,20
14	125	300110 0034	31,30
14	160	300110 0035	38,20
14	200	300110 0036	44,40
16	100	300110 0037	30,20
16	125	300110 0038	36,40
16	160	300110 0039	44,60
16	200	300110 0040	52,90
18	160	300110 0041	66,20
18	200	300110 0042	83,40
20	200	300110 0043	84,50
20	250	300110 0044	108,-
25	160	300110 0045	111,-
25	200	300110 0046	134,50
25	250	300110 0047	171,-

3101



Form B

Continued on next page &gt;&gt;&gt;

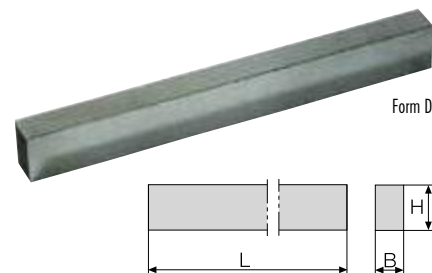
**Type D, rectangular, tolerance h13**

B mm	H mm	L mm	art.no.	€
4	16	100	300120 0001	16,70
4	16	160	300120 0002	23,70
5	10	100	300120 0003	11,65
5	10	160	300120 0004	18,95
5	10	200	300120 0005	23,30
5	20	100	300120 0006	20,10
5	20	160	300120 0007	29,20
5	20	200	300120 0008	36,20
6	10	100	300120 0009	12,50
6	10	160	300120 0010	19,25
6	10	200	300120 0011	24,20
6	12	100	300120 0012	13,10
6	12	160	300120 0013	19,15
6	25	160	300120 0014	40,40
6	25	200	300120 0015	50,30
8	12	100	300120 0016	14,05
8	12	160	300120 0017	22,10
8	12	200	300120 0018	27,50
8	16	100	300120 0019	24,20

3101

B mm	H mm	L mm	art.no.	€
8	16	160	300120 0020	30,20
8	16	200	300120 0021	38,20
8	32	200	300120 0022	73,30
10	16	100	300120 0023	22,10
10	16	160	300120 0024	36,20
10	16	200	300120 0025	44,20
10	20	100	300120 0026	31,40
10	20	160	300120 0027	49,80
10	20	200	300120 0028	62,60
10	40	160	300120 0029	112,-
10	40	200	300120 0030	140,50
12	20	160	300120 0031	57,50
12	20	200	300120 0032	72,30
12	25	200	300120 0033	72,30
12	25	250	300120 0034	99,20
16	25	160	300120 0035	84,50
16	25	200	300120 0036	105,-
16	32	200	300120 0037	108,-

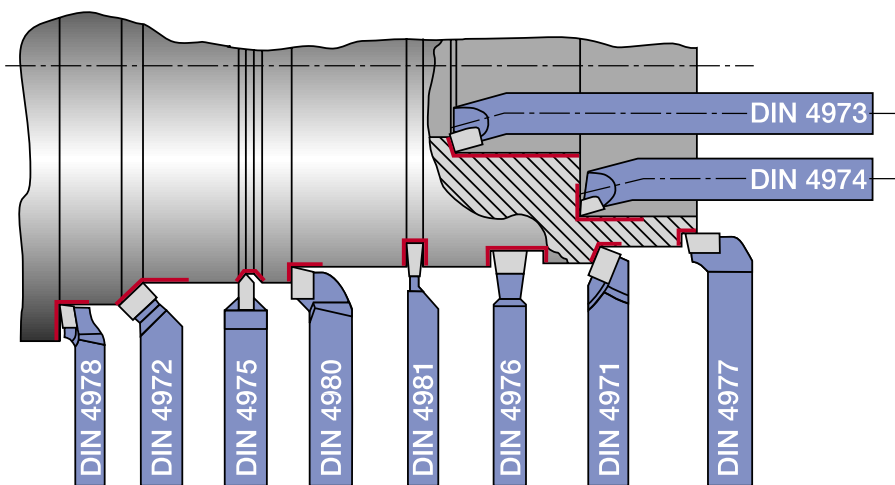
3101



**Turning tool**

HM

- Shanks made from non-alloy steel (700 - 800 N/mm<sup>2</sup> in strength)
- Finely ground face and flank surfaces
- Fitted with ISO solid carbide cutting inserts according to DIN 4950
- **P20**  
**P25/P30** multi-range quality  
**K10/K20** multi-range quality
- Unit prices when purchased in PU
- Other qualities can be found in our webshop



Illustrations show RH version

**Straight turning tool, right-hand, DIN 4971 - ISO 1**

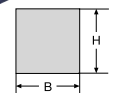
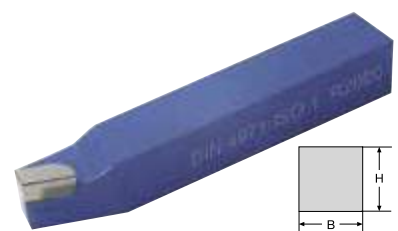
- Left-hand version available on request

B mm	H mm	L mm	Cutting edge width mm	☒	P20 art.no.	€	☒	P25 / P30 art.no.	€	☒	K10 / K20 art.no.	€
10	10	90	8.0	5	302001 0202	6,25	5	302001 0203	6,25	5	302001 0221	6,25
12	12	100	10.0	5	302001 0302	7,40	5	302001 0303	7,40	5	302001 0321	7,40
16	16	110	12.2	5	302001 0402	8,80	5	302001 0403	8,80	5	302001 0421	8,80
20	20	125	16.5	5	302001 0502	11,40	5	302001 0503	11,40	5	302001 0521	11,40
25	25	140	20.6	2	302001 0602	16,50	2	302001 0603	16,50	2	302001 0621	16,50
32	32	170	25.5	2	302001 0703	27,60	2	302001 0703	27,60	2	302001 0721	27,60

3103

3103

3103



**Curved turning tool, right-hand, DIN 4972 - ISO 2**

B mm	H mm	L mm	Cutting edge width mm		P20		P25 / P30		K10 / K20			
					art.no.	€	art.no.	€	art.no.	€		
10	10	90	7.7	5	302005 0202	6,25	5	302005 0203	6,25	5	302005 0221	6,25
12	12	100	9.9	5	302005 0302	7,80	5	302005 0303	7,80	5	302005 0321	7,80
16	16	110	11.6	5	302005 0402	9,15	5	302005 0403	9,15	5	302005 0421	9,15
20	20	125	15.9	5	302005 0502	11,55	5	302005 0503	11,55	5	302005 0521	11,55
25	25	140	19.7	2	302005 0602	16,50	2	302005 0603	16,50	2	302005 0621	16,50
32	32	170	24.9	2	302005 0702	27,60	2	302005 0703	27,60	2	302005 0721	27,60
					3103		3103		3103			



**Curved turning tool, left-hand, DIN 4972 - ISO 2**

B mm	H mm	L mm	Cutting edge width mm		P20		P25 / P30		K10 / K20			
					art.no.	€	art.no.	€	art.no.	€		
10	10	90	7.7	5	302007 0202	6,25	5	302007 0203	6,25	5	302007 0221	6,25
12	12	100	9.9	5	302007 0302	7,80	5	302007 0303	7,80	5	302007 0321	7,80
16	16	110	11.6	5	302007 0402	9,15	5	302007 0403	9,15	5	302007 0421	9,15
20	20	125	15.9	5	302007 0502	11,55	5	302007 0503	11,55	5	302007 0521	11,55
25	25	140	19.7	2	302007 0602	16,50	2	302007 0603	16,50	2	302007 0621	16,50
32	32	170	24.9	2	302007 0702	27,60	2	302007 0703	27,60	2	302007 0721	27,60
					3103		3103		3103			



**Internal turning tool with square shank, DIN 4973 - ISO 8**

• Available with round shank on request

B mm	H mm	L mm	Cutting edge width mm		P20		P25 / P30		K10 / K20			
					art.no.	€	art.no.	€	art.no.	€		
8	8	125	5.0	5	302010 0102	6,55	5	302010 0103	6,55	5	302010 0121	6,55
10	10	150	6.0	5	302010 0202	8,75	5	302010 0203	8,75	5	302010 0221	8,75
12	12	180	8.2	5	302010 0302	9,20	5	302010 0303	9,20	5	302010 0321	9,20
16	16	210	10.3	5	302010 0402	11,40	5	302010 0403	11,40	5	302010 0421	11,40
20	20	250	12.0	5	302010 0502	13,95	5	302010 0503	13,95	5	302010 0521	13,95
25	25	300	15.5	2	302010 0602	21,10	2	302010 0603	21,10	2	302010 0621	21,10
32	32	355	20.0	2	302010 0702	30,50	2	302010 0703	30,50	2	302010 0721	30,50
					3103		3103		3103			



**Internal corner turning tool with square shank, DIN 4974 - ISO 9**

B mm	H mm	L mm	Cutting edge width mm		P20		P25 / P30		K10 / K20			
					art.no.	€	art.no.	€	art.no.	€		
8	8	125	5.1	5	302015 0102	6,55	5	302015 0103	6,55	5	302015 0121	6,55
10	10	150	6.0	5	302015 0202	8,65	5	302015 0203	8,65	5	302015 0221	8,65
12	12	180	8.7	5	302015 0302	9,20	5	302015 0303	9,20	5	302015 0321	9,20
16	16	210	9.4	5	302015 0402	11,40	5	302015 0403	11,40	5	302015 0421	11,40
20	20	250	11.8	5	302015 0502	13,95	5	302015 0503	13,95	5	302015 0521	13,95
25	25	300	15.0	2	302015 0602	19,05	2	302015 0603	19,05	2	302015 0621	19,05
32	32	355	19.4	2	302015 0702	30,50	2	302015 0703	30,50	2	302015 0721	30,50
					3103		3103		3103			



**Internal corner turning tool with straight shank, DIN 4974 - ISO 9**

D mm	L mm	Cutting edge width mm		P20		P25 / P30		K10 / K20			
				art.no.	€	art.no.	€	art.no.	€		
8	125	5.1	5	302017 2202	6,55	5	302017 2203	6,55	5	302017 2221	6,55
10	150	6.0	5	302017 2302	8,65	5	302017 2303	8,65	5	302017 2321	8,65
12	180	8.7	5	302017 2402	9,20	5	302017 2403	9,20	5	302017 2421	9,20
16	210	9.4	5	302017 2502	11,40	5	302017 2503	11,40	5	302017 2521	11,40
20	250	11.8	5	302017 2602	13,95	5	302017 2603	13,95	5	302017 2621	13,95
25	300	15.0	2	302017 2702	19,05	2	302017 2703	19,05	2	302017 2721	19,05
				3103		3103		3103			






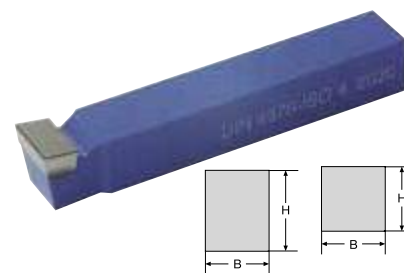
**Pointed turning tool, DIN 4975**

B mm	H mm	L mm		P20		P25 / P30		K10 / K20			
				art.no.	€	art.no.	€	art.no.	€		
10	16	110	5	302020 1202	7,35	5	302020 1203	7,35	5	302020 1221	7,35
12	20	125	5	302020 1302	8,65	5	302020 1303	8,65	5	302020 1321	8,65
16	25	140	5	302020 1402	10,40	5	302020 1403	10,40	5	302020 1421	10,40
20	32	170	2	302020 1502	14,50	2	302020 1503	14,50	2	302020 1521	14,50
					3103		3103		3103		

Continued on next page >>>

**Broad turning tool, DIN 4976 - ISO 4**

B mm	H mm	L mm	Cutting edge width mm		P20 art.no.	€		P25 / P30 art.no.	€		K10 / K20 art.no.	€
10	10	90	10.0	5	302025 0202	7,65	5	302025 0203	7,65	5	302025 0221	7,65
12	12	100	11.6	5	302025 0302	9,30	5	302025 0303	9,30	5	302025 0321	9,30
16	16	110	16.0	5	302025 0402	11,25	5	302025 0403	11,25	5	302025 0421	11,25
20	20	125	20.0	5	302025 0502	14,-	5	302025 0503	14,-	5	302025 0521	14,-
20	32	170	20.0	5	302025 1502	19,55	5	302025 1503	19,55	5	302025 1521	19,55
25	25	140	24.7	2	302025 0602	24,40	2	302025 0603	24,40	2	302025 0621	24,40
32	32	170	31.5	2	302025 0702	43,30	2	302025 0703	43,30	2	302025 0721	43,30
					3103		3103		3103		3103	




**Offset face turning tool, right-hand, DIN 4977 - ISO 5**

• Left-hand version available on request




B mm	H mm	L mm	Cutting edge width mm		P20 art.no.	€		P25 / P30 art.no.	€		K10 / K20 art.no.	€
16	16	110	7.4	5	302030 0402	9,30	5	302030 0403	9,30	5	302030 0421	9,30
20	20	125	9.7	5	302030 0502	12,20	5	302030 0503	12,20	5	302030 0521	12,20
25	25	140	11.2	2	302030 0602	16,80	2	302030 0603	16,80	2	302030 0621	16,80
					3103		3103		3103		3103	

**Offset corner turning tool, right-hand, DIN 4978 - ISO 3**


• Left-hand version available on request

B mm	H mm	L mm	Cutting edge width mm		P20 art.no.	€		P25 / P30 art.no.	€		K10 / K20 art.no.	€
10	16	110	8.0	5	302035 1202	8,-	5	302035 1203	8,-	5	302035 1221	8,-
12	20	125	10.0	5	302035 1302	9,05	5	302035 1303	9,05	5	302035 1321	9,05
16	25	140	12.2	5	302035 1402	11,10	5	302035 1403	11,10	5	302035 1421	11,10
					3103		3103		3103		3103	

**Offset side turning tool, right-hand, DIN 4980 - ISO 6**




B mm	H mm	L mm	Cutting edge width mm		P20 art.no.	€		P25 / P30 art.no.	€		K10 / K20 art.no.	€
10	10	90	8.7	5	302040 0202	7,15	5	302040 0203	7,15	5	302040 0221	7,15
12	12	100	10.0	5	302040 0302	7,65	5	302040 0303	7,65	5	302040 0321	7,65
16	16	110	12.2	5	302040 0402	9,20	5	302040 0403	9,20	5	302040 0421	9,20
20	20	125	15.8	5	302040 0502	11,50	5	302040 0503	11,50	5	302040 0521	11,50
25	25	140	20.0	2	302040 0602	15,90	2	302040 0603	15,90	2	302040 0621	15,90
32	32	170	25.4	2	302040 0702	25,70	2	302040 0703	25,70	2	302040 0721	25,70
					3103		3103		3103		3103	

**Offset side turning tool, left-hand, DIN 4980 - ISO 6**




B mm	H mm	L mm	Cutting edge width mm		P20 art.no.	€		P25 / P30 art.no.	€		K10 / K20 art.no.	€
10	10	90	8.7	5	302042 0202	7,15	5	302042 0203	7,15	5	302042 0221	7,15
12	12	100	10.0	5	302042 0302	7,65	5	302042 0303	7,65	5	302042 0321	7,65
16	16	110	12.2	5	302042 0402	9,20	5	302042 0403	9,20	5	302042 0421	9,20
20	20	125	15.8	5	302042 0502	11,50	5	302042 0503	11,50	5	302042 0521	11,50
25	25	140	20.0	2	302042 0602	15,90	2	302042 0603	15,90	2	302042 0621	15,90
32	32	170	25.4	2	302042 0702	25,70	2	302042 0703	25,70	2	302042 0721	25,70
					3103		3103		3103		3103	






**Parting-off tool, right-hand, DIN 4981 - ISO 7**

B mm	H mm	L mm	Cutting edge width mm	 P20 art.no.	€	 P25 / P30 art.no.	€	 K10 / K20 art.no.	€
8	12	100	3.2	5 302045 1102	6,80	5 302045 1103	6,80	5 302045 1121	6,80
10	16	110	4.2	5 302045 1202	7,50	5 302045 1203	7,50	5 302045 1221	7,50
12	20	125	5.0	5 302045 1302	9,10	5 302045 1303	9,10	5 302045 1321	9,10
16	25	140	6.2	5 302045 1402	11,55	5 302045 1403	11,55	5 302045 1421	11,55
20	32	170	8.4	5 302045 1502	16,10	5 302045 1503	16,10	5 302045 1521	16,10
25	40	200	10.4	2 302045 1602	29,10	2 302045 1603	29,10	2 302045 1621	29,10
				3103		3103		3103	

**Parting-off tool, left-hand, DIN 4981 - ISO 7**

B mm	H mm	L mm	Cutting edge width mm	 P20 art.no.	€	 P25 / P30 art.no.	€	 K10 / K20 art.no.	€
8	12	100	3.2	5 302047 1102	6,80	5 302047 1103	6,80	5 302047 1121	6,80
10	16	110	4.2	5 302047 1202	7,50	5 302047 1203	7,50	5 302047 1221	7,50
12	20	125	5.3	5 302047 1302	9,10	5 302047 1303	9,10	5 302047 1321	9,10
16	25	140	6.2	5 302047 1402	11,55	5 302047 1403	11,55	5 302047 1421	11,55
20	32	170	8.4	5 302047 1502	16,10	5 302047 1503	16,10	5 302047 1521	16,10
25	40	200	10.4	2 302047 1602	29,10	2 302047 1603	29,10	2 302047 1621	29,10
				3103		3103		3103	

**Hooked turning tool, no. 263**

B mm	H mm	L mm	Cutting edge width mm	 P20 art.no.	€	 P25 / P30 art.no.	€	 K10 / K20 art.no.	€
10	10	140	3.0	5 302050 0202	11,95	5 302050 0203	11,95	5 302050 0221	11,95
12	12	160	4.0	5 302050 0302	14,60	5 302050 0303	14,60	5 302050 0321	14,60
16	16	180	5.0	5 302050 0402	16,90	5 302050 0403	16,90	5 302050 0421	16,90
20	20	210	6.0	5 302050 0502	19,05	5 302050 0503	19,05	5 302050 0521	19,05
25	25	250	8.0	2 302050 0602	25,70	2 302050 0603	25,70	2 302050 0621	25,70
32	32	300	10.0	2 302050 0702	42,20	2 302050 0703	42,20	2 302050 0721	42,20
				3103		3103		3103	

**Internal thread turning tool, no. 283 - 60°**

B mm	H mm	L mm	 P20 art.no.	€	 P25 / P30 art.no.	€	 K10 / K20 art.no.	€
10	10	140	5 302060 0202	14,80	5 302060 0203	14,80	5 302060 0221	14,80
12	12	160	5 302060 0302	17,90	5 302060 0303	17,90	5 302060 0321	17,90
16	16	180	5 302060 0402	22,80	5 302060 0403	22,80	5 302060 0421	22,80
20	20	210	5 302060 0502	25,80	5 302060 0503	25,80	5 302060 0521	25,80
25	25	250	2 302060 0602	33,30	2 302060 0603	33,30	2 302060 0621	33,30
				3103		3103		3103

Over 200,000 tools available online!

Register online now!

[www.saratools.com](http://www.saratools.com)



## ATORN® Precision thread cutting

INFO

The threading inserts are clamped in the holder using Torx screws; you can use virtually all the tool holders available on the market.

Affordable thread turning for external and internal threads, especially on CNC processing machines.



### Ground version

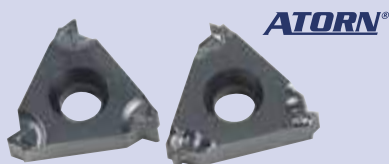
Version ground on all sides with **highly accurate profile geometry**

- Guaranteed quality due to complete control
- Maximum precision possible
- Chip breakers ground from solid material



### Ground version with sintered chip breaker

- Controlled chip breaking
- Longer service life



### Threading inserts product range

	ATORN®
Partial profiles, 60°	•
Partial profiles, 55°	•
ISO metric thread	•
UN full profile thread (Unified)	•
BSW British Standard Whitworth thread	•
NPT American standard taper pipe thread	•
Trapezoidal thread according to DIN 103	•
Round thread according to DIN 405	•
PG (DIN 40430) armoured pipe thread	•
Saw-tooth thread (DIN 513)	•
Type Z inserts, 4.1 mm, for Sandvik holders	•
Mini thread	•

### Other threading inserts are available on request:

- ACME American trapezoidal thread
- Oil thread
  - API - round
  - API - V 0.040
  - API - V 0.038 R
  - API - V 0.050
- BSPT British tapered pipe thread
- NPTF
- STUB ACME
- UNJ
- Multiple thread ridge inserts and thread based on drawings available on request

### Multiple thread ridge inserts available on request



### Recess turning inserts

ISO standard thread turning holder can also be used with recess turning inserts for grooving!



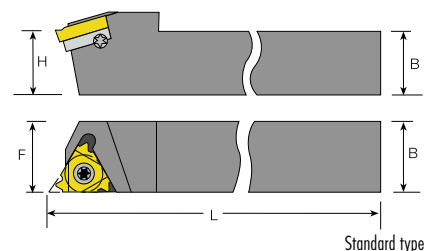
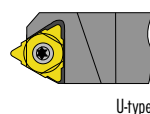
### Application areas of the available carbide qualities

Quality	ISO	Application area
<b>HC 5625</b> PVD TIN	P15-P35	For non-alloyed and alloyed steel at low to medium cutting speeds
<b>HC 5615</b> PVD TIN	P10-P25 K10-K20	For machining non-alloyed, alloyed and stainless steels, super alloys, hardened steels, cast iron materials and non-ferrous metals at medium cutting speeds
<b>HC 5630</b> PVD TIAlN	P20-P40 K20-K30	For machining non-alloyed, alloyed and stainless steels, super alloys, hardened steels and cast iron materials at medium to high cutting speeds
<b>HC 5640</b> PVD TIN	P30-P50 K25-K40	For non-alloyed and alloyed steels at low cutting speeds, particularly suitable for stainless steels
<b>HC 5620</b> PVD	M10-M20 K05-K20 N10-N20 S10-S20	For stainless steel, cast iron, titanium, non-ferrous metals and high-temperature alloys
<b>HC 5110</b> PVD	H01-H20	For hardened steels, cast iron, super alloys up to 62 HRc

0 partial profile, 60° and 55°	Page 975
DIN ISO full profile, metric	Page 976
DIN ISO full profile, metric high-performance coating	Page 980
DIN ISO full profile UN, BSW	Page 980
DIN ISO round, trapezoidal	Page 982
DIN ISO mini thread	Page 983
Recess turning inserts	Page 986

## ATORN® Tool holder

- **External thread**
- **Note:** All tool holders are manufactured with a pitch angle of 1.5°. Other pitch angles are specified in the pitch angle table in the technical part of the catalogue.
- \* = tool holder without spacers
- \*\* = available with clamping claw on request



### External thread

Designation	B mm	L mm	F mm	l mm	H mm						Right-hand		Left-hand		
						art.no.	€	art.no.	€	art.no.	€				
SER 10 10 H11	10	100	11	11*	10	A1					E1	340101 0002	89,50		
SEL 10 10 H11	10	100	11	11*	10	A1					E1			340110 0002	89,50
SER 12 12 F16	12	80	16	16**	12	A2	B1	C1			E2	340101 0011	89,50		
SEL 12 12 F16	12	80	16	16**	12	A2	B1		D1		E2			340110 0011	89,50
SER 16 16 H16	16	100	16	16**	16	A2	B1	C1			E2	340101 0012	89,50		
SEL 16 16 H16	16	100	16	16**	16	A2	B1		D1		E2			340110 0012	89,50
SER 20 20 K16	20	125	20	16**	20	A2	B1	C1			E2	340101 0013	89,50		
SEL 20 20 K16	20	125	20	16**	20	A2	B1		D1		E2			340110 0013	89,50
SER 25 25 M16	25	150	25	16**	25	A2	B1	C1			E2	340101 0014	94,60		
SEL 25 25 M16	25	150	25	16**	25	A2	B1		D1		E2			340110 0014	94,60
SER 25 25 M22	25	150	25	22	25	A3	B2	C2			E3	340101 0021	102,-		
SEL 25 25 M22	25	150	25	22	25	A3	B2		D2		E3			340110 0021	102,-
SER 32 32 P22	32	170	32	22	32	A3	B2	C2			E3	340101 0022	140,50		
SEL 32 32 P22	32	170	32	22	32	A3	B2		D2		E3			340110 0022	140,50
SER 32 32 P22U	32	170	32	22U	32	A3	B2	C3			E3	340101 0031	145,50		
SEL 32 32 P22U	32	170	32	22U	32	A3	B2		D3		E3			340110 0031	145,50
SER 25 25 M27	25	150	32	27	25	A4	B3	C4			E4	340101 0041	129,50		
SEL 25 25 M27	25	150	32	27	25	A4	B3		D4		E4			340110 0041	129,50
SER 32 32 P27	32	170	32	27	32	A4	B3	C4			E4	340101 0042	171,-		
SEL 32 32 P27	32	170	32	27	32	A4	B3		D4		E4			340110 0042	171,-
SER 32 32 P27U	32	170	32	27U	32	A4	B3	C5			E4	340101 0051	172,-		
SEL 32 32 P27U	32	170	32	27U	32	A4	B3		D5		E4			340110 0051	172,-
												3112			3112

### Spare parts

Screw		Spacer screw		Spacer, external right-hand/internal left-hand		Spacer, external left-hand/internal right-hand		Wrench			
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€		
A1	341401 0001	2,06	B1	341410 0011	2,06	C1	341430 0011	8,80	E1	705141 0008	5,40
A2	341401 0011	1,67	B2	341410 0021	2,87	C2	341430 0021	13,75	E2	705141 0010	5,75
A3	341401 0021	2,71	B3	341410 0041	3,80	C3	341430 0031	13,75	E3	705141 0020	7,05
A4	341401 0041	3,80				C4	341430 0041	23,-	E4	705141 0025	7,65
						C5	341430 0051	23,-			
	3116		3116		3116		3116				7114



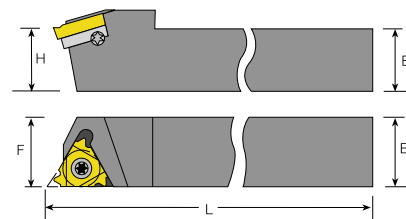
# Clamp mounting with internal cooling

NEW



- External thread
- With internal coolant supply
- **Note:** All tool holders are manufactured with a pitch angle of 1.5°. Other pitch angles are specified in the pitch angle table in the technical part of the catalogue.

With internal cooling



Standard type

## External thread

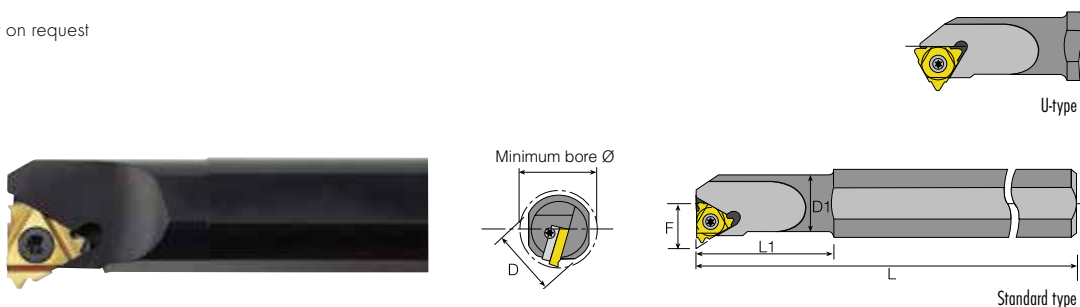
Designation	B mm	L mm	F mm	I mm	H mm							Right-hand art.no.	€	Left-hand art.no.	€
DER 1616 H16	16	100	16	16	16	A1		C1	D1	E1	F2	340120 0001	141,50		
DEL 1616 H16	16	100	16	16	16		B1	C1	D1	E1	F1			340130 0001	141,50
DER 2020 K16	20	125	20	16	20	A1		C1	D1	E1	F2	340120 0002	141,50		
DEL 2020 K16	20	125	20	16	20		B1	C1	D1	E1	F1			340130 0002	141,50
DER 2525 M16	25	150	25	16	25	A1		C1	D1	E1	F2	340120 0003	168,-		
DEL 2525 M16	25	150	25	16	25		B1	C1	D1	E1	F1			340130 0003	168,-
DER 2525 M22	25	150	25	22	25	A2		C2	D1	E1	F4	340120 0004	168,-		
DEL 2525 M22	25	150	25	22	25		B2	C2	D1	E1	F3			340130 0004	168,-
												3164		3164	

## Spare parts

Spacer, external right-hand/internal left-hand		Spacer, external left-hand/internal right-hand		Spacer screw		Screw		Sealing ring set		Clamping claw with internal cooling	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	341450 0001 10,70	B1	341450 0002 10,70	C1	341450 0006 7,15	D1	341450 0008 10,70	E1	341450 0009 10,70	F1	341450 0010 21,40
A2	341450 0003 10,70	B2	341450 0004 10,70	C2	341450 0007 7,15					F2	341450 0011 21,40
										F3	341450 0012 21,40
										F4	341450 0013 21,40
	3164		3164		3164		3164		3164		3164

# ATORN® Boring bars

- **Female thread**
- **Note:** All boring bars are manufactured with a pitch angle of 1.5°. Other pitch angles are specified in the pitch angle table in the technical part of the catalogue
- \* = boring bar without spacers
- \*\* = available with clamping claw on request



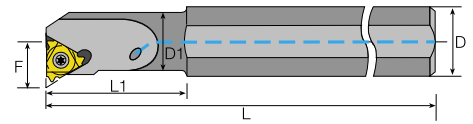
## Female thread

Designation	l mm	D mm	D1 mm	Min. hole Ø mm	L mm	L1 mm	F mm	A	B	C	D	E	Right-hand		Left-hand	
													art.no.	€	art.no.	€
SIR 0010H11	11*	10	10	12.0	100	-	7.4	A1				E1	340301 0001	91,60		
SIL 0010H11	11*	10	10	12.0	100	-	7.4	A1				E1			340310 0001	91,60
SIR 0010 K11	11*	16	10	12.0	125	25	7.4	A1				E1	340301 0002	91,60		
SIL 0010 K11	11*	16	10	12.0	125	25	7.4	A1				E1			340310 0002	91,60
SIR 0013 L11	11*	16	13	15.0	140	32	8.9	A1				E1	340301 0003	91,60		
SIL 0013 L11	11*	16	13	15.0	140	32	8.9	A1				E1			340310 0003	91,60
SIR 0013 M16	16*	16	13	16.0	150	32	10.2	A2				E2	340301 0011	91,60		
SIL 0013 M16	16*	16	13	16.0	150	32	10.2	A2				E2			340310 0011	91,60
SIR 0016 P16	16*	20	16	19.0	170	40	11.7	A2				E2	340301 0012	91,60		
SIL 0016 P16	16*	20	16	19.0	170	40	11.7	A2				E2			340310 0012	91,60
SIR 0020 P16	16**	20	20	24.0	170	-	13.7	A2	B1		D1	E2	340301 0013	104,-		
SIL 0020 P16	16**	20	20	24.0	170	-	13.7	A2	B1	C1		E2			340310 0013	104,-
SIR 0025 R16	16**	25	25	29.0	200	-	16.2	A2	B1		D1	E2	340301 0014	116,-		
SIL 0025 R16	16**	25	25	29.0	200	-	16.2	A2	B1	C1		E2			340310 0014	116,-
SIR 0032 S16	16**	32	32	36.0	250	-	19.7	A2	B1		D1	E2	340301 0015	145,50		
SIL 0032 S16	16**	32	32	36.0	250	-	19.7	A2	B1	C1		E2			340310 0015	145,50
SIR 0040 T16	16**	40	40	44.0	300	-	23.7	A2	B1		D1	E2	340301 0016	194,50		
SIL 0040 T16	16**	40	40	44.0	300	-	23.7	A2	B1	C1		E2			340310 0016	194,50
SIR 0020 P22	22*	20	20	24.0	170	-	15.6	A3				E3	340301 0021	107,-		
SIL 0020 P22	22*	20	20	24.0	170	-	15.6	A3				E3			340310 0021	107,-
SIR 0025 R22	22**	25	25	29.0	200	-	18.1	A3	B2		D2	E3	340301 0022	123,50		
SIL 0025 R22	22**	25	25	29.0	200	-	18.1	A3	B2	C2		E3			340310 0022	123,50
SIR 0032 S22	22	32	32	38.0	250	-	21.6	A3	B2		D2	E3	340301 0023	148,50		
SIL 0032 S22	22	32	32	38.0	250	-	21.6	A3	B2	C2		E3			340310 0023	148,50
SIR 0040 T22	22	40	40	46.0	300	-	25.6	A3	B2		D2	E3	340301 0024	191,50		
SIL 0040 T22	22	40	40	46.0	300	-	25.6	A3	B2	C2		E3			340310 0024	191,50
SIR 0032 S22U	22U	32	32	38.0	250	-	24.4	A3	B2		D3	E3	340301 0031	161,-		
SIL 0032 S22U	22U	32	32	38.0	250	-	24.4	A3	B2	C3		E3			340310 0031	161,-
SIR 0040 T22U	22U	40	40	46.0	300	-	28.1	A3	B2		D3	E3	340301 0032	202,-		
SIL 0040 T22U	22U	40	40	46.0	300	-	28.1	A3	B2	C3		E3			340310 0032	202,-
SIR 0032 S27	27	32	32	40.0	250	-	22.6	A4	B3		D4	E4	340301 0041	190,50		
SIL 0032 S27	27	32	32	40.0	250	-	22.6	A4	B3	C4		E4			340310 0041	190,50
SIR 0050 U27	27	50	50	58.0	350	-	31.6	A4	B3		D4	E4	340301 0043	275,-		
SIL 0050 U27	27	50	50	58.0	350	-	31.6	A4	B3	C4		E4			340310 0043	275,-
SIR 0032 S27U	27U	32	32	40.0	250	-	25.8	A4	B3		D5	E4	340301 0051	146,50		
SIL 0032 S27U	27U	32	32	40.0	250	-	25.8	A4	B3	C5		E4			340310 0051	146,50
SIR 0050 U27U	27U	50	50	58.0	350	-	34.3	A4	B3		D5	E4	340301 0053	280,-		
SIL 0050 U27U	27U	50	50	58.0	350	-	34.3	A4	B3	C5		E4			340310 0053	280,-

3112

3112

Continued on next page >>>



**Boring bars with internal coolant supply**

Designation	l mm	D mm	D1 mm	Min. hole Ø mm	L mm	L1 mm	F mm			Right-hand		Left-hand			
										art.no.	€	art.no.	€		
SIR 0010 K11B	11*	16	10	12.0	125	25	7.4	A1		E1	340320 0002	101,-			
SIL 0010 K11B	11*	16	10	12.0	125	25	7.4	A1		E1			340321 0002	101,-	
SIR 0013 M16B	16*	16	13	16.0	150	32	10.2	A2		E2	340320 0011	101,-			
SIL 0013 M16B	16*	16	13	16.0	150	32	10.2	A2		E2			340321 0011	101,-	
SIR 0016 P16B	16*	20	16	19.0	170	40	11.7	A2		E2	340320 0012	101,-			
SIL 0016 P16B	16*	20	16	19.0	170	40	11.7	A2		E2			340321 0012	101,-	
SIR 0020 P16B	16	20	20	24.0	170	-	13.7	A2	B1		E2	340320 0013	114,-		
SIL 0020 P16B	16	20	20	24.0	170	-	13.7	A2	B1	C1	E2			340321 0013	114,-
SIR 0025 R16B	16	25	25	29.0	200	-	16.2	A2	B1		E2	340320 0014	127,50		
SIL 0025 R16B	16	25	25	29.0	200	-	16.2	A2	B1	C1	E2			340321 0014	127,50
SIR0025 R22B	22	25	25	29.0	200	-	18.1	A3	B2		E3	340320 0022	135,50		
SIL0025 R 22B	22	25	25	29.0	200	-	18.1	A3	B2	C2	E3			340321 0022	135,50

3112

3112

**Spare parts**

Screw		Spacer screw		Spacer, external right-hand/internal left-hand		Spacer, external left-hand/internal right-hand		Wrench	
art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	341401 0001 2,06	B1	341410 0011 2,06	C1	341430 0011 8,80	D1	341430 0012 8,80	E1	705141 0008 5,40
A2	341401 0011 1,67	B2	341410 0021 2,87	C2	341430 0021 13,75	D2	341430 0022 13,75	E2	705141 0010 5,75
A3	341401 0021 2,71	B3	341410 0041 3,80	C3	341430 0031 13,75	D3	341430 0032 13,75	E3	705141 0020 7,05
A4	341401 0041 3,80			C4	341430 0041 23,-	D4	341430 0042 23,-	E4	705141 0025 7,65
				C5	341430 0051 23,-	D5	341430 0052 23,-		

3116

3116

3116

3116

7114

**YOUR DRILL**

# GIVES UP.

• WHAT DO YOU DO? YOU REACH

# FOR A NEW ONE

**AND SIMPLY CARRY ON:  
SARA®GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

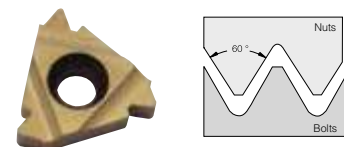
**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE



## ATORN® Thread cutting inserts, partial profile, 60°

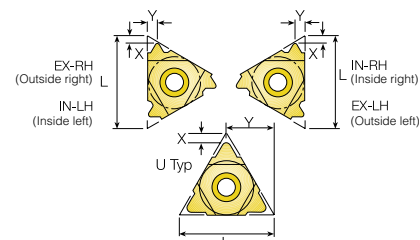


- Partial profile, 60°
- Inserts available in left-hand version on request



### Partial profile, 60° external right-hand, ground

Designation	L mm	Pitch mm	X mm	Y mm	☐	ISO <b>CMKSH</b>		ISO <b>CMKN</b>		
						HC 5630 art.no.	€	HC 5615 art.no.	€	
11 ER A60	11	0.5-1.5	0.8	0.9	10	342001 0127	16,20	10	342001 0135	16,20
16 ER A60	16	0.5-1.5	0.8	0.9	10	342001 0227	16,20	10	342001 0235	16,20
16 ER G60	16	1.75-3.0	1.2	1.7	10	342001 0327	17,50	10	342001 0335	17,50
16 ER AG60	16	0.5-3.0	1.2	1.7	10	342001 0427	17,50	10	342001 0435	17,50
22 ER N60	22	3.5-5.0	1.7	2.5	5	342001 0527	27,50	5	342001 0535	27,50
22 UER/L U60	22U	5.5-8.0	0.6	11.0	5	342001 0627	27,50	5	342001 0635	27,50
						3113		3113		



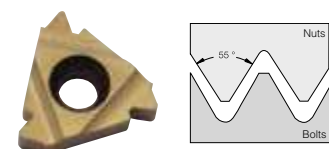
### Partial profile, 60° internal right-hand, ground

Designation	L mm	Pitch mm	X mm	Y mm	☐	ISO <b>CMKSH</b>		ISO <b>CMKN</b>		
						HC 5630 art.no.	€	HC 5615 art.no.	€	
11 IR A60	11	0.5-1.5	0.8	0.9	10	342201 0127	16,20	10	342201 0135	16,20
16 IR A60	16	0.5-1.5	0.8	0.9	10	342201 0227	16,20	10	342201 0235	16,20
16 IR G60	16	1.75-3.0	1.2	1.7	10	342201 0327	17,50	10	342201 0335	17,50
16 IR AG60	16	0.5-3.0	1.2	1.7	10	342201 0427	17,50	10	342201 0435	17,50
22 IR N60	22	3.5-5.0	1.7	2.5	5	342201 0527	27,50	5	342201 0535	27,50
22U IR/L U60	22U	5.5-8.0	0.6	11.0	5	342201 0627	27,50	5	342201 0635	27,50
						3113		3113		

## ATORN® Thread cutting inserts, partial profile, 55°

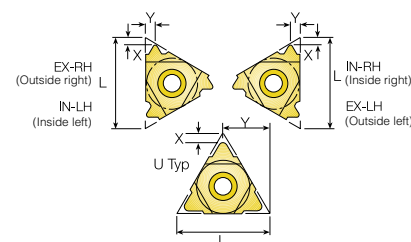


- Partial profile, 55°
- Inserts available in left-hand version on request



### Partial profile, 55° external right-hand, ground

Designation	L mm	Pitch TPI	X mm	Y mm	☐	ISO <b>CMKSH</b>		ISO <b>CMKN</b>		
						HC 5630 art.no.	€	HC 5615 art.no.	€	
11 ER A55	11	48 - 16	0.8	0.9	10	342401 0127	17,80	10	342401 0135	17,80
16 ER A55	16	48 - 16	0.8	0.9	10	342401 0227	17,80	10	342401 0235	17,80
16 ER G55	16	14 - 8	1.2	1.7	10	342401 0327	19,15	10	342401 0335	19,15
16 ER AG55	16	48 - 8	1.2	1.7	10	342401 0427	19,15	10	342401 0435	19,15
22 ER N55	22	7 - 5	1.7	2.5	5	342401 0527	29,70	5	342401 0535	29,70
22 UER U55	22U	4.5 - 3.25	0.9	11.0	5	342401 0627	29,70	5	342401 0635	29,70
						3113		3113		



### Partial profile, 55° internal right-hand, ground

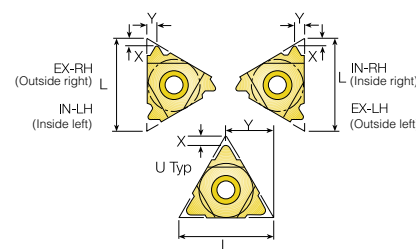
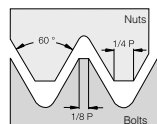
Designation	L mm	Pitch TPI	X mm	Y mm	☐	ISO <b>CMKSH</b>		ISO <b>CMKN</b>		
						HC 5630 art.no.	€	HC 5615 art.no.	€	
11 IR A55	11	48 - 16	0.8	0.9	10	342601 0127	17,80	10	342601 0135	17,80
16 IR A55	16	48 - 16	0.8	0.9	10	342601 0227	17,80	10	342601 0235	17,80
16 IR G55	16	14 - 8	1.2	1.7	10	342601 0327	19,15	10	342601 0335	19,15
16 IR AG55	16	48 - 8	1.2	1.7	10	342601 0427	19,15	10	342601 0435	19,15
22 IR N55	22	7 - 5	1.7	2.5	10	342601 0527	29,70	5	342601 0535	29,70
22U IR U55	22U	4.5 - 3.25	0.9	11.0	5	342601 0627	29,70	5	342601 0635	29,70
						3113		3113		



# ATORN® Thread cutting inserts, full profile, ISO, ER



• Metric, full profile, ISO



## Full profile, ISO external right-hand, ground

Designation	L mm	Pitch mm	X mm	Y mm	ISO <b>P M K S H</b>		ISO <b>P</b>		ISO <b>P M K N</b>				
					HC 5630 art.no.	€	HC 5625 art.no.	€	HC 5615 art.no.	€			
11 ER 0.35ISO	11	0.35	0.8	0.4			10	<b>342801 0130</b>	<b>17,30</b>	10	<b>342801 0135</b>	<b>17,30</b>	
11 ER 0.4ISO	11	0.4	0.7	0.4			10	342801 0230	17,30	10	342801 0235	17,30	
11 ER 0.45ISO	11	0.45	0.7	0.4			10	342801 0330	17,30	10	342801 0335	17,30	
11 ER 0.5ISO	11	0.5	0.6	0.6			10	342801 0430	17,30	10	342801 0435	17,30	
11 ER 0.6ISO	11	0.6	0.6	0.6			10	342801 0530	17,30	10	342801 0535	17,30	
11 ER 0.7ISO	11	0.7	0.6	0.6			10	342801 0630	17,30	10	342801 0635	17,30	
11 ER 0.75ISO	11	0.75	0.6	0.6			10	342801 0730	17,30	10	342801 0735	17,30	
11 ER 0.8ISO	11	0.8	0.6	0.6			10	342801 0830	17,30	10	342801 0835	17,30	
11 ER 1.0ISO	11	1.0	0.7	0.7			10	342801 0930	15,15	10	342801 0935	15,15	
11 ER 1.25ISO	11	1.25	0.8	0.9			10	342801 1030	15,15	10	342801 1035	15,15	
11 ER 1.5ISO	11	1.5	0.8	1.0			10	342801 1130	15,15	10	342801 1135	15,15	
11 ER 1.75ISO	11	1.75	0.8	1.1			10	342801 1230	15,15	10	342801 1235	15,15	
16 ER 0.35ISO	16	0.35	0.8	0.4			10	342801 1330	17,30	10	342801 1335	17,30	
16 ER 0.4ISO	16	0.4	0.7	0.4	10	<b>342801 1427</b>	<b>17,30</b>	10	342801 1430	17,30	10	342801 1435	17,30
16 ER 0.45ISO	16	0.45	0.7	0.4			10	342801 1530	17,30	10	342801 1535	17,30	
16 ER 0.5ISO	16	0.5	0.6	0.6	10	342801 1627	17,30	10	342801 1630	17,30	10	342801 1635	17,30
16 ER 0.6ISO	16	0.6	0.6	0.6			10	342801 1730	17,30	10	342801 1735	17,30	
16 ER 0.7ISO	16	0.7	0.6	0.6			10	342801 1830	17,30	10	342801 1835	17,30	
16 ER 0.75ISO	16	0.75	0.6	0.6	10	342801 1927	17,30	10	342801 1930	17,30	10	342801 1935	17,30
16 ER 0.8ISO	16	0.8	0.6	0.6	10	342801 2027	17,30	10	342801 2030	17,30	10	342801 2035	17,30
16 ER 1.0ISO	16	1.0	0.7	0.7	10	342801 2127	15,15	10	342801 2130	15,15	10	342801 2135	15,15
16 ER 1.25ISO	16	1.25	0.8	0.9	10	342801 2227	15,15	10	342801 2230	15,15	10	342801 2235	15,15
16 ER 1.5ISO	16	1.5	0.8	1.0	10	342801 2327	15,15	10	342801 2330	15,15	10	342801 2335	15,15
16 ER 1.75ISO	16	1.75	0.9	1.2	10	342801 2427	15,15	10	342801 2430	15,15	10	342801 2435	15,15
16 ER 2.0ISO	16	2.0	1.0	1.3	10	342801 2527	15,15	10	342801 2530	15,15	10	342801 2535	15,15
16 ER 2.5ISO	16	2.5	1.1	1.5	10	342801 2627	16,60	10	342801 2630	16,60	10	342801 2635	16,60
16 ER 3.0ISO	16	3.0	1.2	1.6	10	342801 2727	16,60	10	342801 2730	16,60	10	342801 2735	16,60
16 ER 3.5ISO	16	3.5	1.2	1.7						10	342801 3735	16,60	
22 ER 3.5ISO	22	3.5	1.6	2.3	5	342801 2827	22,80	5	342801 2830	22,80	5	342801 2835	22,80
22 ER 4.0ISO	22	4.0	1.6	2.3	5	342801 2927	22,80	5	342801 2930	22,80	5	342801 2935	22,80
22 ER 4.5ISO	22	4.5	1.7	2.4	5	342801 3027	22,80	5	342801 3030	22,80	5	342801 3035	22,80
22 ER 5.0ISO	22	5.0	1.7	2.5	5	342801 3127	22,80	5	342801 3130	22,80	5	342801 3135	22,80
22 ER 5.5ISO	22	5.5	1.7	2.6						5	342801 3835	22,80	
22 ER 6.0ISO	22	6.0	1.9	2.7						5	342801 3935	22,80	
27 ER 5.5ISO	27	5.5	1.9	2.7				2	342801 3230	37,90	2	342801 3235	37,90
27 ER 6.0ISO	27	6.0	2.0	2.9				2	342801 3330	37,90	2	342801 3335	37,90
22U ER/L5.5ISO	22U	5.5	2.3	11.0				5	342801 3430	28,60	5	342801 3435	28,60
22U ER/L6.0ISO	22U	6.0	2.6	11.0				5	342801 3530	28,60	5	342801 3535	28,60
27U ER/L8.0ISO	27U	8.0	2.4	13.7				2	342801 3630	37,90	2	342801 3635	37,90

3113

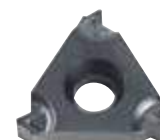
3113

3113

## Full profile, ISO external right-hand, with chip breaker type B

Designation	L mm	Pitch mm	X mm	Y mm	ISO <b>P M K S H</b>		
					HC 5630 art.no.	€	
16 ERB 1.0ISO	16	1.0	0.7	0.7	10	<b>342802 2127</b>	<b>15,15</b>
16 ERB 1.25ISO	16	1.25	0.8	0.9	10	342802 2227	15,15
16 ERB 1.5ISO	16	1.5	0.8	1.0	10	342802 2327	15,15
16 ERB 1.75ISO	16	1.75	0.9	1.2	10	342802 2427	15,15
16 ERB 2.0ISO	16	2.0	1.0	1.3	10	342802 2527	15,15
16 ERB 2.5ISO	16	2.5	1.1	1.5	10	342802 2627	16,60
16 ERB 3.0ISO	16	3.0	1.2	1.6	10	342802 2727	16,60

3113



10 pcs set, ground profile, external right

Contents per set		ISO <b>P M K S H</b>
		<b>HC 5630</b>
		art.no. €
2 units 16 ER 1.0 ISO	<b>342801</b> 5016 <b>141,50</b>	
2 units 16 ER 1.25 ISO		
2 units 16 ER 1.5 ISO		
2 units 16 ER 1.75 ISO		
2 units 16 ER 2.0 ISO		

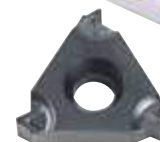
3113



10 pcs set, ground profile, external right with chip breaker B

Contents		ISO <b>P M K S H</b>
		<b>HC 5630</b>
		art.no. €
2 units 16 ER B 1.0 ISO	<b>342802</b> 5016 <b>141,50</b>	
2 units 16 ER B 1.25 ISO		
2 units 16 ER B 1.5 ISO		
2 units 16 ER B 1.75 ISO		
2 units 16 ER B 2.0 ISO		

3113



**ATORN®** Thread cutting inserts, full profile, ISO, EL

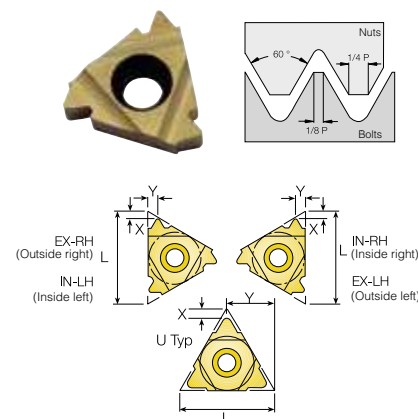


- **Metric, ISO full profile**
- **Note:** Insert types 22 U and 27 U in pitches of 5.5-8.0 mm are identical to the right-hand version (see full profile ISO, ER)

Full profile, ISO external left-hand, ground

Designation	L mm	Pitch mm	X mm	Y mm	HC 5615 art.no.	€
11 EL 0.35ISO	11	0.35	0.8	0.4	10 <b>342810</b> 0135	<b>17,30</b>
11 EL 0.4ISO	11	0.4	0.7	0.4	10 342810 0235	<b>17,30</b>
11 EL 0.45ISO	11	0.45	0.7	0.4	10 342810 0335	<b>17,30</b>
11 EL 0.5ISO	11	0.5	0.6	0.6	10 342810 0435	<b>17,30</b>
11 EL 0.6ISO	11	0.6	0.6	0.6	10 342810 0535	<b>17,30</b>
11 EL 0.7ISO	11	0.7	0.6	0.6	10 342810 0635	<b>17,30</b>
11 EL 0.75ISO	11	0.75	0.6	0.6	10 342810 0735	<b>17,30</b>
11 EL 1.0ISO	11	1.0	0.7	0.7	10 342810 0935	<b>15,15</b>
11 EL 1.25ISO	11	1.25	0.8	0.9	10 342810 1035	<b>15,15</b>
11 EL 1.5ISO	11	1.5	0.8	1.0	10 342810 1135	<b>15,15</b>
11 EL 1.75ISO	11	1.75	0.8	1.1	10 342810 1235	<b>15,15</b>
16 EL 0.35ISO	16	0.35	0.8	0.4	10 342810 1335	<b>17,30</b>
16 EL 0.4ISO	16	0.4	0.7	0.4	10 342810 1435	<b>17,30</b>
16 EL 0.45ISO	16	0.45	0.7	0.4	10 342810 1535	<b>17,30</b>
16 EL 0.5ISO	16	0.5	0.6	0.6	10 342810 1635	<b>17,30</b>
16 EL 0.6ISO	16	0.6	0.6	0.6	10 342810 1735	<b>17,30</b>
16 EL 0.7ISO	16	0.7	0.6	0.6	10 342810 1835	<b>17,30</b>
16 EL 0.75ISO	16	0.75	0.6	0.6	10 342810 1935	<b>17,30</b>
16 EL 0.8ISO	16	0.8	0.6	0.6	10 342810 2035	<b>17,30</b>
16 EL 1.0 ISO	16	1.0	0.7	0.7	10 342810 2135	<b>15,15</b>
16 EL 1.25ISO	16	1.25	0.8	0.9	10 342810 2235	<b>15,15</b>
16 EL 1.5ISO	16	1.5	0.8	1.0	10 342810 2335	<b>15,15</b>
16 EL 1.75ISO	16	1.75	0.9	1.2	10 342810 2435	<b>15,15</b>
16 EL 2.0ISO	16	2.0	1.0	1.3	10 342810 2535	<b>15,15</b>
16 EL 2.5ISO	16	2.5	1.1	1.5	10 342810 2635	<b>16,60</b>
16 EL 3.0ISO	16	3.0	1.2	1.6	10 342810 2735	<b>16,60</b>
16 EL 3.5ISO	16	3.5	1.2	1.7	10 342810 2735	<b>16,60</b>
22 EL 3.5ISO	22	3.5	1.6	2.3	5 342810 2835	<b>22,80</b>
22 EL 4.0ISO	22	4.0	1.6	2.3	5 342810 2935	<b>22,80</b>
22 EL 4.5ISO	22	4.5	1.7	2.4	5 342810 3035	<b>22,80</b>
22 EL 5.0ISO	22	5.0	1.7	2.5	5 342810 3135	<b>22,80</b>
22 EL 5.5ISO	22	5.5	1.7	2.6	5 342810 3835	<b>22,80</b>
22 EL 6.0ISO	22	6.0	1.9	2.7	5 342810 3935	<b>22,80</b>
27 EL 5.5ISO	27	5.5	1.9	2.7	2 342810 3235	<b>37,90</b>
27 EL 6.0ISO	27	6.0	2.0	2.9	2 342810 3335	<b>37,90</b>

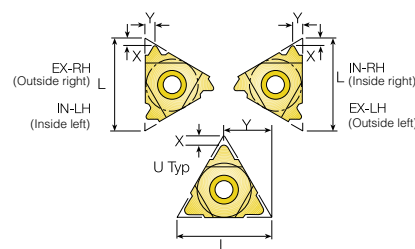
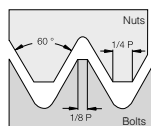
3113



# ATORN® Thread cutting inserts, full profile, ISO, IR



• Metric, full profile, ISO



## Full profile, ISO internal right-hand, ground

Designation	L mm	Pitch mm	X mm	Y mm	ISO P M K S H		ISO P		ISO P M K N				
					HC 5630 art.no.	€	HC 5625 art.no.	€	HC 5615 art.no.	€			
11 IR 0.35ISO	11	0.35	0.8	0.3			10	343001 0130	17,30	10	343001 0135	17,30	
11 IR 0.4ISO	11	0.4	0.8	0.4			10	343001 0230	17,30	10	343001 0235	17,30	
11 IR 0.45ISO	11	0.45	0.8	0.4			10	343001 0330	17,30	10	343001 0335	17,30	
11 IR 0.5ISO	11	0.5	0.6	0.6	10	343001 0427	17,30	10	343001 0430	17,30	10	343001 0435	17,30
11 IR 0.6ISO	11	0.6	0.6	0.6			10	343001 0530	17,30	10	343001 0535	17,30	
11 IR 0.7ISO	11	0.7	0.6	0.6			10	343001 0630	17,30	10	343001 0635	17,30	
11 IR 0.75ISO	11	0.75	0.6	0.6	10	343001 0727	17,30	10	343001 0730	17,30	10	343001 0735	17,30
11 IR 0.8ISO	11	0.8	0.6	0.6			10	343001 0830	17,30	10	343001 0835	17,30	
11 IR 1.0ISO	11	1.0	0.6	0.7	10	343001 0927	15,15	10	343001 0930	15,15	10	343001 0935	15,15
11 IR 1.25ISO	11	1.25	0.8	0.8			10	343001 1030	15,15	10	343001 1035	15,15	
11 IR 1.5ISO	11	1.5	0.8	1.0	10	343001 1127	15,15	10	343001 1130	15,15	10	343001 1135	15,15
11 IR 1.75ISO	11	1.75	0.8	1.1			10	343001 1230	15,15	10	343001 1235	15,15	
11 IR 2.0ISO	11	2.0	0.8	0.9	10	343001 4127	15,15			10	343001 4135	15,15	
16 IR 0.5ISO	16	0.5	0.6	0.6						10	343001 4035	17,30	
16 IR 0.6ISO	16	0.6	0.6	0.6				10	343001 1430	17,30	10	343001 1435	17,30
16 IR 0.7ISO	16	0.7	0.6	0.6				10	343001 1530	17,30	10	343001 1535	17,30
16 IR 0.75ISO	16	0.75	0.6	0.6				10	343001 1630	17,30	10	343001 1635	17,30
16 IR 0.8ISO	16	0.8	0.6	0.6				10	343001 1730	17,30	10	343001 1735	17,30
16 IR 1.0ISO	16	1.0	0.6	0.7	10	343001 1827	15,15	10	343001 1830	15,15	10	343001 1835	15,15
16 IR 1.25ISO	16	1.25	0.8	0.9	10	343001 1927	15,15	10	343001 1930	15,15	10	343001 1935	15,15
16 IR 1.5ISO	16	1.5	0.8	1.0	10	343001 2027	15,15	10	343001 2030	15,15	10	343001 2035	15,15
16 IR 1.75ISO	16	1.75	0.9	1.2	10	343001 2127	15,15	10	343001 2130	15,15	10	343001 2135	15,15
16 IR 2.0ISO	16	2.0	1.0	1.3	10	343001 2227	15,15	10	343001 2230	15,15	10	343001 2235	15,15
16 IR 2.5ISO	16	2.5	1.1	1.5	10	343001 2327	16,60	10	343001 2330	16,60	10	343001 2335	16,60
16 IR 3.0ISO	16	3.0	1.1	1.5	10	343001 2427	16,60	10	343001 2430	16,60	10	343001 2435	16,60
16 IR 3.5ISO	16	3.5	1.2	1.7						10	343001 3435	16,60	
22 IR 3.5ISO	22	3.5	1.6	2.3	5	343001 2527	22,80	5	343001 2530	22,80	5	343001 2535	22,80
22 IR 4.0ISO	22	4.0	1.6	2.3	5	343001 2627	22,80	5	343001 2630	22,80	5	343001 2635	22,80
22 IR 4.5ISO	22	4.5	1.6	2.4				5	343001 2730	22,80	5	343001 2735	22,80
22 IR 5.0ISO	22	5.0	1.6	2.3				5	343001 2830	22,80	5	343001 2835	22,80
22 IR 5.5ISO	22	5.5	1.6	2.3						5	343001 3535	22,80	
22 IR 6.0ISO	22	6.0	1.6	2.4						5	343001 3635	22,80	
22U IR/L5.5ISO	22U	5.5	2.4	11.0				5	343001 3130	28,60	5	343001 3135	28,60
22U IR/L6.0ISO	22U	6.0	2.1	11.0				5	343001 3230	28,60	5	343001 3235	28,60
27 IR 5.5ISO	27	5.5	1.6	2.3				2	343001 2930	37,90	2	343001 2935	37,90
27 IR 6.0ISO	27	6.0	1.8	2.5				2	343001 3030	37,90	2	343001 3035	37,90
27U IR/L8.0ISO	27U	8.0	2.4	13.7				2	343001 3330	37,90	2	343001 3335	37,90

3113

3113

3113

## Full profile, ISO internal right-hand, ground, with chip breaker type B

Designation	L mm	Pitch mm	X mm	Y mm	ISO P M K S H		
					HC 5630 art.no.	€	
16 IRB 1.0ISO	16	1.0	0.6	0.7	10	343002 1827	15,15
16 IRB 1.25ISO	16	1.25	0.8	0.9	10	343002 1927	15,15
16 IRB 1.5ISO	16	1.5	0.8	1.0	10	343002 2027	15,15
16 IRB 1.75ISO	16	1.75	0.9	1.2	10	343002 2127	15,15
16 IRB 2.0ISO	16	2.0	1,0	1,3	10	343002 2227	15,15
16 IRB 2.5ISO	16	2.5	1.1	1.5	10	343002 2327	16,60
16 IRB 3.0ISO	16	3.0	1.1	1.5	10	343002 2427	16,60

3113



10 pcs set, ground profile, internal right

Contents		ISO <b>P M K S H</b>	HC 5630
		art.no.	€
2 units 16 IR 1.0 ISO			
2 units 16 IR 1.25 ISO			
2 units 16 IR 1.5 ISO			
2 units 16 IR 1.75 ISO			
2 units 16 IR 2.0 ISO			
		<b>343001</b>	5016 <b>141,50</b>
		3113	



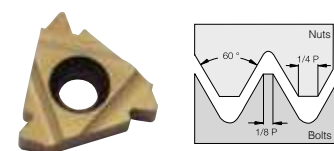
10 pcs set, ground profile, internal right with chip breaker B

Contents		ISO <b>P M K S H</b>	HC 5630
		art.no.	€
2 units 16 IR B 1.0 ISO			
2 units 16 IR B 1.25 ISO			
2 units 16 IR B 1.5 ISO			
2 units 16 IR B 1.75 ISO			
2 units 16 IR B 2.0 ISO			
		<b>343002</b>	5016 <b>141,50</b>
		3113	

**ATORN®** Thread cutting inserts, full profile, ISO, IL

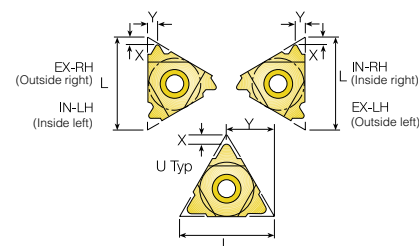


- **Metric, ISO full profile**
- **Note:** Insert types 22 U and 27 U in pitches of 5.5-8.0 mm are identical to the right-hand version (see full profile ISO, IR)



Full profile, ISO internal left-hand, ground

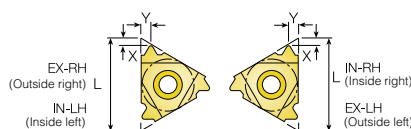
Designation	L mm	Pitch mm	X mm	Y mm	ISO <b>P M K S H</b>	HC 5615	
						art.no.	€
11 IL 0.35ISO	11	0.35	0.8	0.3	10	<b>343010</b>	0135 <b>17,30</b>
11 IL 0.4ISO	11	0.4	0.8	0.4	10	343010	0235 <b>17,30</b>
11 IL 0.5ISO	11	0.5	0.6	0.6	10	343010	0435 <b>17,30</b>
11 IL 0.7ISO	11	0.7	0.6	0.6	10	343010	0635 <b>17,30</b>
11 IL 0.75ISO	11	0.75	0.6	0.6	10	343010	0735 <b>17,30</b>
11 IL 0.8ISO	11	0.8	0.6	0.6	10	343010	0835 <b>17,30</b>
11 IL 1.0ISO	11	1.0	0.6	0.7	10	343010	0935 <b>15,15</b>
11 IL 1.25ISO	11	1.25	0.8	0.8	10	343010	1035 <b>15,15</b>
11 IL 1.5ISO	11	1.5	0.8	1.0	10	343010	1135 <b>15,15</b>
11 IL 1.75ISO	11	1.75	0.8	1.1	10	343010	1235 <b>15,15</b>
11 IL 2.0ISO	11	2.0	0.8	0.9	10	343010	4135 <b>15,15</b>
16 IL 0.35ISO	16	0.35	0.8	0.3	10	343010	1335 <b>17,30</b>
16 IL 0.6ISO	16	0.6	0.6	0.6	10	343010	1435 <b>17,30</b>
16 IL 0.75 ISO	16	0.75	0.6	0.6	10	343010	1635 <b>17,30</b>
16 IL 0.8ISO	16	0.8	0.6	0.6	10	343010	1735 <b>17,30</b>
16 IL 1.0 ISO	16	1.0	0.6	0.7	10	343010	1835 <b>15,15</b>
16 IL 1.25ISO	16	1.25	0.8	0.9	10	343010	1935 <b>15,15</b>
16 IL 1.5ISO	16	1.5	0.8	1.0	10	343010	2035 <b>15,15</b>
16 IL 1.75ISO	16	1.75	0.9	1.2	10	343010	2135 <b>15,15</b>
16 IL 2.0ISO	16	2.0	1.0	1.3	10	343010	2235 <b>15,15</b>
16 IL 2.5ISO	16	2.5	1.1	1.5	10	343010	2335 <b>16,60</b>
16 IL 3.0ISO	16	3.0	1.1	1.5	10	343010	2435 <b>16,60</b>
16 IL 3.5ISO	16	3.5	1.2	1.7	10	343010	3435 <b>16,60</b>
22 IL 3.5ISO	22	3.5	1.6	2.3	5	343010	2535 <b>22,80</b>
22 IL 4.0ISO	22	4.0	1.6	2.3	5	343010	2635 <b>22,80</b>
22 IL 4.5ISO	22	4.5	1.6	2.4	5	343010	2735 <b>22,80</b>
22 IL 5.0ISO	22	5.0	1.6	2.3	5	343010	2835 <b>22,80</b>
22 IL 5.5ISO	22	5.5	1.6	2.3	5	343010	3535 <b>22,80</b>
22 IL 6.0ISO	22	6.0	1.6	2.4	5	343010	3635 <b>22,80</b>
27 IL 5.5ISO	27	5.5	1.6	2.3	2	343010	2935 <b>37,90</b>
27 IL 6.0ISO	27	6.0	1.8	2.5	2	343010	3035 <b>37,90</b>



## ATORN® High-performance thread cutting inserts



- New high-performance coating for significantly higher cutting speeds
- Full profile ISO ER
- Full profile IR available on request

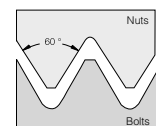


### Full profile, 60° external right-hand, ground

ISO **M K N S H**

Designation	L mm	Pitch mm	X mm	Y mm	ISO	HC 5620	
						art.no.	€
16 ER 1.0 ISO	16	1.0	0.7	0.7	10	342164 2145	16,60
16 ER 1.25 ISO	16	1.25	0.8	0.9	10	342164 2245	16,60
16 ER 1.5 ISO	16	1.5	0.8	1.0	10	342164 2345	16,60
16 ER 1.75 ISO	16	1.75	0.9	1.2	10	342164 2445	16,60
16 ER 2.0 ISO	16	2.0	1.0	1.3	10	342164 2545	16,60
16 ER 3.0 ISO	16	3.0	1.2	1.6	10	342164 2745	18,25

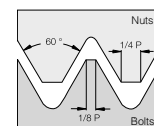
3113



## ATORN® Thread cutting inserts, full profile, UN



- Full profile, UN
- other insert sizes and pitches available on request, along with left-hand version

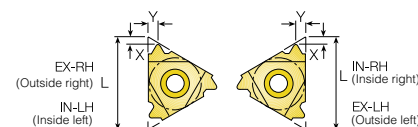


### Full profile, UN external right-hand, ground

ISO **M K N**

Designation	L mm	Pitch TPI	X mm	Y mm	ISO	HC 5615	
						art.no.	€
16 ER 20UN	16	20	0.8	0.9	10	343201 2735	18,45
16 ER 18UN	16	18	0.8	1.0	10	343201 2835	18,45
16 ER 16UN	16	16	0.9	1.1	10	343201 2935	18,45
16 ER 12UN	16	12	1.1	1.4	10	343201 3235	18,45

3113



### Full profile, UN internal right-hand, ground

ISO **M K N**

Designation	L mm	Pitch TPI	X mm	Y mm	ISO	HC 5615	
						art.no.	€
16 IR 14UN	16	14	0.9	1.2	10	343401 3035	18,45
16 IR 12UN	16	12	1.1	1.4	10	343401 3235	18,45

3113



Grooving from 2 mm ...

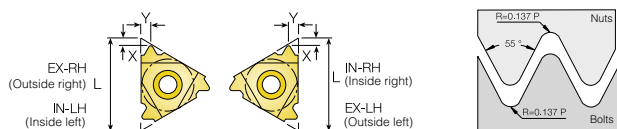
... with internal cooling.

**ATORN®**  
Performance demands quality

## ATORN® Thread cutting inserts, full profile, BSW



- Full profile, BSW
- other insert sizes and pitches available on request, along with left-hand version



### Full profile, BSW external right-hand, ground

Designation	L mm	Pitch TPI	X mm	Y mm	ISO P M K S H		ISO P		ISO P M K S H				
					HC 5630 art.no.	€	HC 5625 art.no.	€	HC 5615 art.no.	€			
16 ER 28W	16	28	0.6	0.7			10	344401 2430	18,45	10	344401 2435	18,45	
16 ER 19W	16	19	0.8	1.0	10	344401 2927	18,45	10	344401 2930	18,45	10	344401 2935	18,45
16 ER 14W	16	14	1.0	1.2	10	344401 3227	18,45	10	344401 3230	18,45	10	344401 3235	18,45
16 ER 11W	16	11	1.1	1.5	10	344401 3427	18,45	10	344401 3430	18,45	10	344401 3435	18,45
						3113			3113			3113	

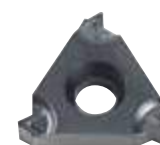


### Full profile, BSW internal right-hand, ground

Designation	L mm	Pitch TPI	X mm	Y mm	ISO P M K S H		ISO P		ISO P M K S H				
					HC 5630 art.no.	€	HC 5625 art.no.	€	HC 5615 art.no.	€			
11 IR 19W	11	19	0.8	1.0	10	344601 1327	18,45	10	344601 1330	18,45	10	344601 1335	18,45
11 IR 14W	11	14	0.9	1.1	10	344601 1627	18,45	10	344601 1630	18,45	10	344601 1635	18,45
16 IR 19W	16	19	0.8	1.0	10	344601 2927	18,45	10	344601 2930	18,45	10	344601 2935	18,45
16 IR 14W	16	14	1.0	1.2	10	344601 3227	18,45	10	344601 3230	18,45	10	344601 3235	18,45
16 IR 11W	16	11	1.1	1.5	10	344601 3427	18,45	10	344601 3430	18,45	10	344601 3435	18,45
						3113			3113			3113	

### Full profile, BSW external right-hand, ground, with chip breaker type B

Designation	L mm	Pitch TPI	X mm	Y mm	ISO P M K S H		
					HC 5630 art.no.	€	
16 ERB 19W	16	19	0.8	1.0	10	344402 2927	18,45
16 ERB 14W	16	14	1.0	1.2	10	344402 3227	18,45
16 ERB 11W	16	11	1.1	1.5	10	344402 3427	18,45
						3113	



### Full profile, BSW internal right-hand, ground, with chip breaker type B

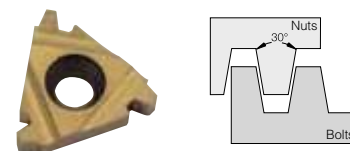
Designation	L mm	Pitch TPI	X mm	Y mm	ISO P M K S H		
					HC 5630 art.no.	€	
16 IRB 19W	16	19	0.8	1.0	10	344602 2927	18,45
16 IRB 14W	16	14	1.0	1.2	10	344602 3227	18,45
16 IRB 11W	16	11	1.1	1.5	10	344602 3427	18,45
						3113	



## ATORN® Thread cutting inserts, full profile, trapezoidal



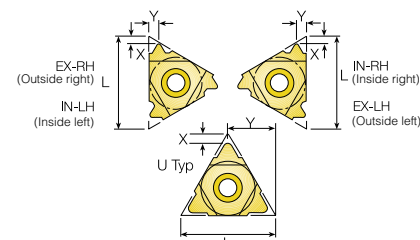
- Full profile, trapezoidal, DIN 103
- other insert sizes and pitches available on request, along with left-hand version



### Full profile, trapezoidal external right-hand, ground

Designation	L mm	Pitch mm	X mm	Y mm	ISO	HC 5615	
						art.no.	€
16 ER 3TR	16	3	1.3	1.5	10	343601 0335	22,10
22 ER 4TR	22	4	1.8	1.9	5	343601 0435	30,70
22 ER 5TR	22	5	2.0	2.4	5	343601 0535	30,70
22 ER 6TR	22	6	2.0	2.4	5	343601 0935	30,70
22 UER/L 6TR	22U	6	2.0	11.0	5	343601 0635	30,70
22 UER/L 8TR	22U	8	2.5	11.0	5	343601 1035	30,70
27 UER/L 8TR	27U	8	2.5	13.7	2	343601 0835	45,60

3113



### Full profile, trapezoidal internal right-hand, ground

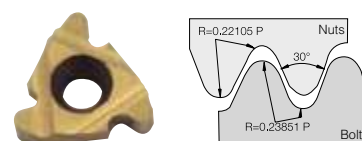
Designation	L mm	Pitch mm	X mm	Y mm	ISO	HC 5615	
						art.no.	€
16 IR 2TR	16	2	1.0	1.3	10	343801 0235	22,10
16 IR 3TR	16	3	1.3	1.5	10	343801 0335	22,10
22 IR 4TR	22	4	1.8	1.9	5	343801 0435	30,70
22 IR 5TR	22	5	2.0	2.4	5	343801 0535	30,70
22 IR 6TR	22	6	2.0	2.4	5	343801 1035	30,70
22 UIR/L 6TR	22U	6	2.0	11.0	5	343801 0635	30,70
22 UIR/L 7TR	22U	7	2.3	11.0	5	343801 0735	30,70
22 UIR/L 8TR	22U	8	2.5	11.0	5	343801 1135	30,70

3113

## ATORN® Thread cutting inserts, full profile, round thread



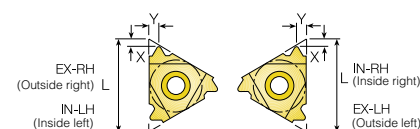
- Full profile, round thread, DIN 405
- other insert sizes and pitches available on request, along with left-hand version



### Full profile, external right-hand, ground

Designation	L mm	Pitch TPI	X mm	Y mm	ISO	HC 5615	
						art.no.	€
16 ER 8 RD	16	8	1.4	1.3	10	345601 0235	22,10
16 ER 6 RD	16	6	1.5	1.7	10	345601 0335	22,10

3113



### Full profile, internal right-hand, ground

Designation	L mm	Pitch TPI	X mm	Y mm	ISO	HC 5625		ISO		
						art.no.	€	art.no.	€	
16 IR 8 RD	16	8	1.4	1.4	10	345801 0230	22,10	10	345801 0235	22,10
16 IR 6 RD	16	6	1.4	1.5	10	345801 0330	22,10	10	345801 0335	22,10
22 IR 6 RD	22	6	1.5	1.7	5	345801 0430	30,70	5	345801 0435	30,70
22 IR 4 RD	22	4	2.2	2.3	5	345801 0530	30,70	5	345801 0535	30,70

3113

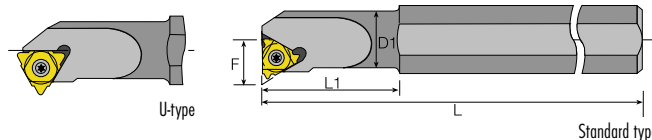
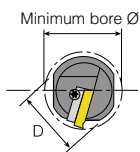
3113



**ATORN® MINI boring bar**



- **Female thread**
- **Note:** The boring bars are used without spacers.
- Especially suited to preventing vibration in applications with long projections and small bore diameters.



**Boring bars**

Designation	l mm	D mm	D1 mm	Min. hole Ø mm	L mm	L1 mm	F mm			Right-hand art.no.	€
SIR 0005 H06	6	12	5.1	6.0	100	12	4.3	A1	B1	340901 0001	101,50
SIR 0007 K08	8	16	6.6	7.8	125	18	5.3	A2	B2	340901 0002	101,50
SIR 0008 K08U	8U	16	7.3	9.0	125	21	6.6	A2	B2	340901 0003	115,-
3112											

**Solid carbide boring bars with internal coolant supply**

Designation	l mm	D mm	D1 mm	Min. hole Ø mm	L mm	L1 mm	F mm			Right-hand art.no.	€
SIR 0005 H06CB	6	6	5.1	6.0	100	26	4.3	A1	B1	340901 0011	234,-
SIR 0007 K08CB	8	8	6.6	7.8	125	31	5.3	A2	B2	340901 0012	260,-
SIR 0008 K08UCB	8U	8	7.3	9.0	125	35	6.6	A2	B2	340901 0013	311,-
3112											

**Spare parts**

Screw			TORX		
	art.no.	€		art.no.	€
A1	341401 0051	2,17	B1	703053 0060	1,93
A2	341401 0061	2,17	B2	703053 0080	1,93
3116			7114		

**EVEN WORKS BACKWARDS.**

**SIMPLY INPUT THE DIMENSIONS, AND YOU'RE DONE:**

**CLAMPING JAWS FINDER**

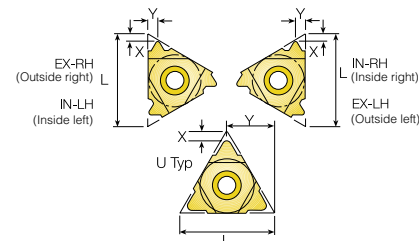
**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE

# ATORN® Thread cutting inserts MINI



- Female thread for bores from 6 mm in diameter
- Amazing combination of Mini thread cutting inserts and coatings
- Specially developed for low speeds
- Successfully replace conventional taps
- Left-hand version available on request



## Partial profile, 60° and 55° internal right-hand, ground

ISO **M K S**

Designation	L mm	Pitch mm	Pitch TPI	X mm	Y mm	HC 5640		
						art.no.	€	
06 IR A60	6	0.5 - 1.25		0.6	0.6	10	347001 0125	17,-
08 IR A60	8	0.5 - 1.5		0,6	0.7	10	347001 0225	17,-
08 U IR/L U60	8U	1.75 - 2.0		0.8	4.0	10	347001 0325	20,40
06 IR A55	6		48-20	0.5	0.6	10	347001 1125	17,-
08 IR A55	8		48-16	0.6	0.7	10	347001 1225	17,-
08 U IR/L U55	8U		14-11	0.9	4.0	10	347001 1325	20,40

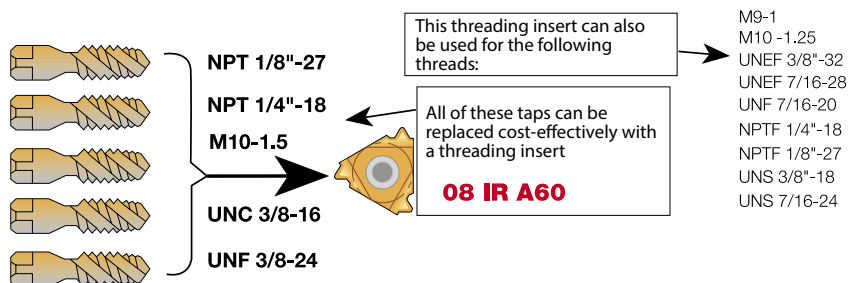
3113

## Full profile, ISO metric internal right-hand, ground

ISO **M K S**

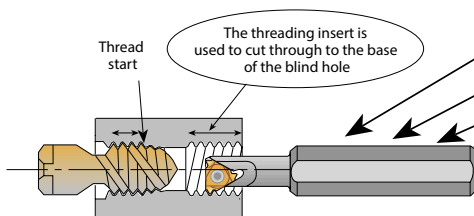
Designation	L mm	Pitch mm	X mm	Y mm	HC 5640		
					art.no.	€	
06 IR 0.5ISO	6	0.5	0.9	0.5	10	347201 0125	17,-
06 IR 0.75ISO	6	0.75	0.8	0.5	10	347201 0225	17,-
06 IR 1.0ISO	6	1.0	0.7	0.6	10	347201 0325	17,-
06 IR 1.25ISO	6	1.25	0.6	0.6	10	347201 0425	17,-
08 IR 0.5ISO	8	0.5	0.6	0.5	10	347201 0525	17,-
08 IR 0.75ISO	8	0.75	0.6	0.5	10	347201 0625	17,-
08 IR 1.0ISO	8	1.0	0.6	0.6	10	347201 0725	17,-
08 IR 1.25ISO	8	1.25	0.6	0.7	10	347201 0825	17,-
08 IR 1.5ISO	8	1.5	0.6	0.7	10	347201 0925	17,-
08 IR 1.75ISO	8	1.75	0.6	0.8	10	347201 1025	17,-
08 U IR/L 2.0ISO	8U	2.0	0.9	4.0	10	347201 1125	20,40

3113



## Advantages:

- \* Better surface
- \* Better cutting geometry
- \* Better tolerances
- \* More flexibility in use with different materials
- \* Low machine power required
- \* No welding possible



**ATORN® Thread cutting set****1090**

- Common thread cutting inserts plus tool holder or boring bar
- For external/female threads

**External**

Contents	art.no.	€
1 threading insert each quality HC 5625: 16ER A60 16ER G60 16ER 0.75 ISO 16ER 1.0 ISO 16ER 1.25 ISO 16ER 1.5 ISO 16ER 1.75 ISO 16ER 2.0 ISO 16ER 2.5 ISO 16ER 3.0 ISO 1 clamp mounting SER 2020 K16 1 TORX key 1 screw	<b>348001</b> 0130	<b>233,-</b>
	3112	

**Internal**

Contents	art.no.	€
1 threading insert each quality HC 5625: 16IR A60 16IR G60 16IR 0.75 ISO 16IR 1.0 ISO 16IR 1.25 ISO 16IR 1.5 ISO 16IR 1.75 ISO 16IR 2.0 ISO 16IR 2.5 ISO 16IR 3.0 ISO 1 boring bar SIR 0020 P 16 1 TORX key 1 screw	<b>348501</b> 0130	<b>255,-</b>
	3112	

**ATORN® Spacer set**

- Spacers with different pitch angles
- **Type AE** for use in external RH/internal LH holders
- **Type AI** for use in external LH/internal RH holders

Contents	art.no.	€
AE16: +4.5 / +3.5 / +2.5 / +0.5 / -1.5 AI16: +4.5 / +3.5 / +2.5 / +0.5 / -1.5	<b>341430</b> 1600	<b>107,-</b>
AE22: +4.5 / +3.5 / +2.5 / +0.5 / -1.5 AI22: +4.5 / +3.5 / +2.5 / +0.5 / -1.5	341430 2200	<b>175,-</b>
AE22U: +4.5 / +3.5 / +2.5 / +0.5 / -1.5 AI22U: +4.5 / +3.5 / +2.5 / +0.5 / -1.5	341430 2250	<b>175,-</b>
AE27: +4.5 / +2.5 / -1.5 AI27: +4.5 / +2.5 / -1.5	341430 2700	<b>175,-</b>
AE27U: +4.5 / +2.5 / -1.5 AI27U: +4.5 / +2.5 / -1.5	341430 2750	<b>175,-</b>
	3116	



## ATORN® Grooving inserts



- For use on thread cutting holders
- Low tool costs, since existing holders can be used
- One tool holder for grooving and thread cutting
- Three cutting edges, precision-ground
- HC 5640 coated
- **Supplied without spacer (spacer set), please order separately!**
- **Boring bars with insert size 16 without spacer cannot be used.**



### Inserts suitable for holder types SER..16 and SIL..16

Designation	W±0.02 mm	T mm	suitable spacer	☒	ISO	
					HC 5640 art.no.	€
16 ER/IL 1.00	1.00	1.4	AE 16-0	5	349050 1025	24,10
16 ER/IL 1.20	1.20	1.6	AE 16-0	5	349050 1225	24,10
16 ER/IL 1.40	1.40	1.8	AE 16-0	5	349050 1425	24,10
16 ER/IL 1.70	1.70	2.0	AE 16-0	5	349050 1725	24,10
16 ER/IL 1.95	1.95	2.0	AE 16-0	5	349050 1925	24,10
16 ER/IL 2.25	2.25	2.25	AE 16-0	5	349050 2225	24,10

3113



### Inserts suitable for holder types SIR..16 and SEL..16

Designation	W±0.02 mm	T mm	suitable spacer	☒	ISO	
					HC 5640 art.no.	€
16 IR/EL 1.00	1.00	1.4	AI 16-0	5	349055 1025	24,10
16 IR/EL 1.20	1.20	1.6	AI 16-0	5	349055 1225	24,10
16 IR/EL 1.40	1.40	1.8	AI 16-0	5	349055 1425	24,10
16 IR/EL 1.70	1.70	2.0	AI 16-0	5	349055 1725	24,10
16 IR/EL 1.95	1.95	2.0	AI 16-0	5	349055 1925	24,10
16 IR/EL 2.25	2.25	2.25	AI 16-0	5	349055 2225	24,10

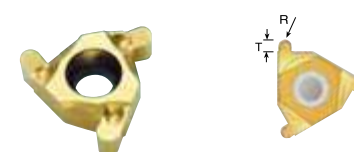
3113



### Radius inserts suitable for holder types SER..16 and SIL..16

Designation	R±0.04 mm	T mm	suitable spacer	☒	ISO	
					HC 5640 art.no.	€
16 ER/IL R 0.5	0.5	1.4	AE 16-0	5	349052 0525	24,10
16 ER/IL R 0.6	0.6	1.6	AE 16-0	5	349052 0625	24,10
16 ER/IL R 0.9	0.9	2.0	AE 16-0	5	349052 0925	24,10
16 ER/IL R 1.0	1.0	2.0	AE 16-0	5	349052 1025	24,10
16 ER/IL R 1.1	1.1	2.15	AE 16-0	5	349052 1125	24,10
16 ER/IL R 1.2	1.2	2.25	AE 16-0	5	349052 1225	24,10

3113



### Radius inserts suitable for holder types SIR..16 and SEL..16

Designation	R±0.04 mm	T mm	suitable spacer	☒	ISO	
					HC 5640 art.no.	€
16IR/EL R 0.5	0.5	1.4	AI 16-0	5	349057 0525	24,10
16IR/EL R 0.6	0.6	1.6	AI 16-0	5	349057 0625	24,10
16IR/EL R 0.9	0.9	2.0	AI 16-0	5	349057 0925	24,10
16IR/EL R 1.0	1.0	2.0	AI 16-0	5	349057 1025	24,10
16IR/EL R 1.1	1.1	2.15	AI 16-0	5	349057 1125	24,10
16IR/EL R 1.2	1.2	2.25	AI 16-0	5	349057 1225	24,10

3113

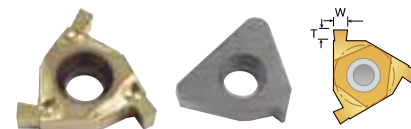


**Insert sets suitable for holder types SER..16 and SIL..16**

ISO

Contents	W mm	T mm	HC 5640 art.no.	€
16 ER/IL 1.0	1.0	1.4	<b>349051</b> 1601	<b>128,50</b>
16 ER/IL 1.20	1.20	1.6		
16 ER/IL 1.40	1.40	1.8		
16 ER/IL 1.70	1.70	2.0		
16 ER/IL 1.95	1.95	2.0		
16 ER/IL 2.25	2.25	2.25		
spacer AE 16-0				

3113

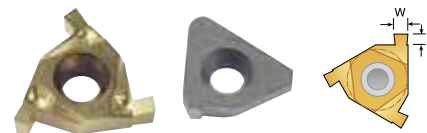


**Insert sets suitable for holder types SIR..16 and SEL..16**

ISO

Contents	W mm	T mm	HC 5640 art.no.	€
16 IR/EL 1.0	1.0	1.4	<b>349056</b> 1601	<b>128,50</b>
16 IR/EL 1.20	1.20	1.6		
16 IR/EL 1.40	1.40	1.8		
16 IR/EL 1.70	1.70	2.0		
16 IR/EL 1.95	1.95	2.0		
16 IR/EL 2.25	2.25	2.25		
spacer AI 16-0				

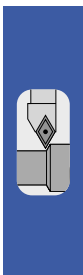
3113



**Spacers for grooving inserts**

Designation	art.no.	€
AE 16-0	<b>349060</b> 1610	<b>10,15</b>
AI 16-0	<b>349060</b> 1620	<b>10,15</b>

3113



Drilling and turning ...

... with a single tool.

**ATORN**<sup>®</sup>  
Performance demands quality

## Model descriptions GROOVE

**INFO**

The new range captivates with 4 models for a wide range of uses and applications.

The **APU40G** is an extremely reliable all-rounder for general applications using steel, stainless steel and cast iron. The high edge stability of the substrate is optimally protected by the customised TiAlN-PVD coating. Protection from the temperature influences that inevitably occur during machining.

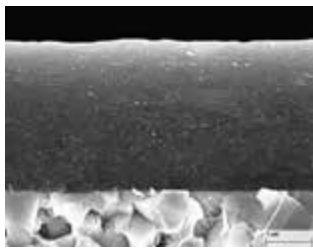
The tougher **APM45G** has the strongest substrate in the range and was specially developed for use with austenitic and stainless steels in unstable conditions. The PVD-TiAlN coating guarantees a high degree of machining reliability with excellent toughness even with materials that are difficult to machine, which is reflected in its process reliability.

The **ACP20G** rounds off the range, for maximum cutting speeds and excellent protection against diffusion wear. The TiCN-Al<sub>2</sub>O<sub>3</sub>-CVD coating protects this medium-tough variant from the excessive temperature influences that occur during recess turning in particular.

The uncoated **AWN16G** is a special substrate for machining non-ferrous materials and aluminium.

### APU40G (universal model)

- HC-P30
- HC-M25
- HC-K30
- HC-S30


**Composition**

Co 9%,  
Composite carbides 2%,  
WC balance

**Grain size**

0.7 - 1 µm

**Hardness**

HV<sub>30</sub> 1590

**Coating**

PVD TiAlN

**Recommendation for use**

Excellent and universal multi-grade model for use in steel, stainless steel, cast iron and heat-resistant chrome nickel alloys (killed)

**Toughness**

1 2 3 4 5 6 7 8 9 10

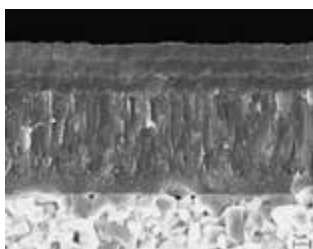
**Wear resistance**

1 2 3 4 5 6 7 8 9 10

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 240
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 200
	Structural steel	700 - 950	Ck45	1.1191	50 - 180
	Tempering steel	500 - 950	42 CrMo4	1.7225	80 - 220
	Cast steel	Up to 950	GS 40	1.0416	60 - 150
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80 - 210
	Tempering steel	950 - 1300	43CrMo4	1.3563	50 - 120
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	50 - 120
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	50 - 120
	M	Stainless steel, ferritic	500 - 950	X10 Cr13	1.4006
Stainless steel, martens. tempered		Up to 330 HB	X19 CrNi17-2	1.4057	50 - 80
Stainless steel, austenitic		500 - 950	X5 CrNi 18 10	1.4301	50 - 200
Duplex		700 - 950	X2 CrNiMoN 22-5-3	1.4462	50 - 100
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	100 - 200
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	80 - 150
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 180
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	80 - 160

### ACP20G

- HC-P35
- HC-M30
- HC-K35


**Composition**

Co 10.5%,  
composite carbides 2%,  
WC balance

**Grain size**

1 µm

**Hardness**

HV<sub>30</sub> 1400

**Coating**

CVD TiCN-Al<sub>2</sub>O<sub>3</sub>

**Recommendation for use**

reliable model for machining steel and cast iron

**Toughness**

1 2 3 4 5 6 7 8 9 10

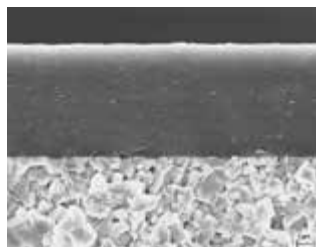
**Wear resistance**

1 2 3 4 5 6 7 8 9 10

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 240
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 200
	Structural steel	700 - 950	Ck45	1.1191	50 - 180
	Tempering steel	500 - 950	42 CrMo4	1.7225	80 - 220
	Cast steel	Up to 950	GS 40	1.0416	60 - 150
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80 - 210
	Tempering steel	950 - 1300	43CrMo4	1.3563	50 - 120
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	50 - 120
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	50 - 120
	M	Stainless steel, ferritic	500 - 950	X10 Cr13	1.4006
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	100 - 200
	Alloyed grey cast iron	Up to 310 HB	GGLNiCr 35 2	0.6678	80 - 150
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 180
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	80 - 160

## APM45G

• HC-P45  
HC-M40  
HC-S40



### Toughness

1 2 3 4 5 6 7 8 9 10

### Wear resistance

1 2 3 4 5 6 7 8 9 10

### Composition

Co 12.5%,  
Composite carbides 2%,  
WC balance

### Grain size

1 - 1.5  $\mu\text{m}$

### Hardness

HV<sub>30</sub> 1380

### Coating

PVD TiAlTaN

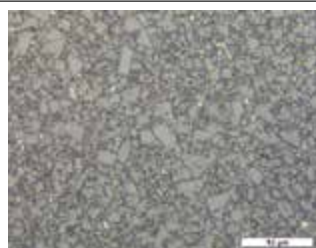
### Recommendation for use

first choice for austenitic steels and stainless steel materials under unstable conditions (interrupted cutting)

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min
P	Gen. steels, interrupted cutt.	Up to 700			40 - 120
M	Stainless steel, ferritic	500 - 950	X10 Cr13	1.4006	100 - 180
	Stainless steel, martens. tempered	Up to 330 HB	X19 CrNi17-2	1.4057	60 - 90
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	80 - 150
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	70 - 110
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50 - 120
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 45
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	20 - 60

## AWN16G

• HW-N15  
HW-K15



### Toughness

1 2 3 4 5 6 7 8 9 10

### Wear resistance

1 2 3 4 5 6 7 8 9 10

### Composition

Co 6%,  
WC balance

### Grain size

1  $\mu\text{m}$

### Hardness

HV<sub>30</sub> 1630

### Coating

Uncoated

### Recommendation for use

first choice for aluminium and non-ferrous metals

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min
N	Al. alloys, long-chipping	Up to 500	AlMg 3	3.3535	400 - 1,500
	Al. alloys, short-chipping	Up to 500	G-AlSi 12	3.2581	200 - 2,000
	Copper alloy (bronze), long-chipping	Up to 1200	CuSn4	2.1016	200 - 600
	Copper alloy (bronze), short-chipping	Up to 850	CuNi12Zn24	2.0730	200 - 600
	Copper alloy (brass), long-chipping	Up to 600	Cu Zn 20	2.0250	200 - 600
	Copper alloy (brass), short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	200 - 600
	Thermoplastic		PVC		200 - 5,000
	Thermoset		Melamine		200 - 5,000
	Fibre-reinforced plastics		CFRP, GFRP		50 - 200





## Overview of chip breakers GROOVE

The new **AD** (ATORN double) chip breakers are designed with dual cutting edges and are suitable for a depth of 24 mm.

The name **AE** (ATORN single) refers to a single cutting edge design and is suitable for punching depths of more than 24 mm.

The **chip breaker M** is suitable for universal use and for all materials. Thanks to the negative edge rounding, it is also suitable for use with high-alloy materials.

The **chip breaker F** was developed to guarantee very soft cutting. This is particularly important for thin-walled materials or pipes. Despite this positive cutting property,

it has very strong edges and offers excellent chip control even at low feed rates. Another positive effect of this chip breaker is the low tendency towards built-up edges, which can offer significant advantages particularly for stainless steel materials.

In addition to the chip breaker F the **chip breaker ET** is a further alternative and a problem-solver in steel machining. Thanks to its high processes reliability, it is the first choice even for the toughest materials like titanium and duplex materials in conjunction with the SP45MG.

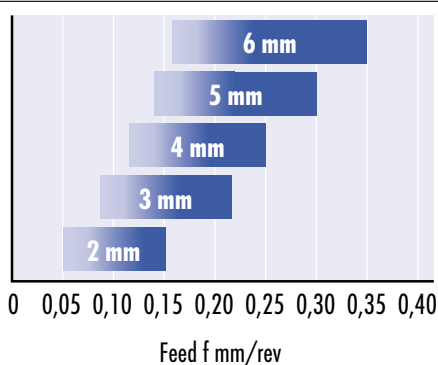
The **chip breaker TR** was developed for recess turning, grooving and parting-off. Optimum chip control is guaranteed, even with low infeed.

The rotating **chip breaker R** is designed for radius indexable cutting inserts and allows chip control with various materials and also stabilises cutting.

Completing the range is the **chip breaker LC**, which was developed for aluminium.

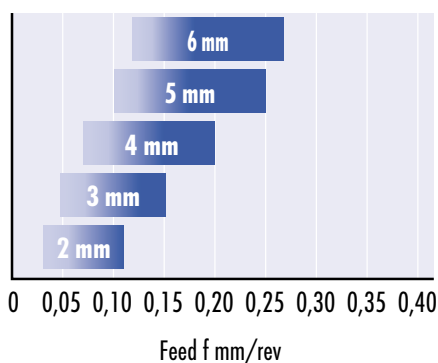
### Chip breaker M-medium, universal

- Recessing insert with slightly negative edge rounding
- Also suitable for high-strength steel
- Suitable for almost all areas of application
- Main application area steel and cast iron



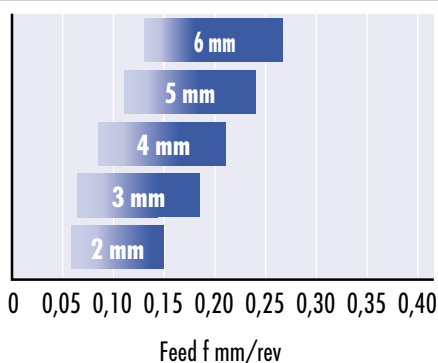
### Chip breaker F-fine

- Excellent, very soft cutting geometry with very low cutting forces
- For materials with low minimum tensile strength
- Ideal for thin-walled components
- High cutting edge stability with ideal chip control even at low feed rates
- Low tendency to form built-up edges



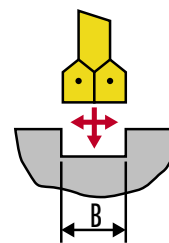
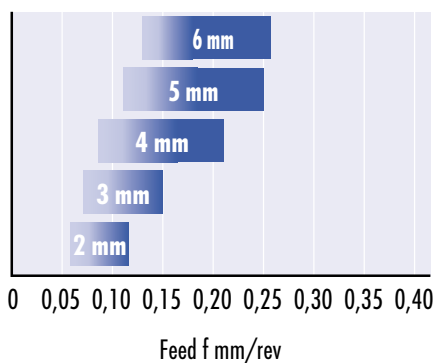
### Chip breaker ET-extra

- Specially for stainless materials
- "Problem-solver" for materials that are difficult to machine such as titanium or duplex
- Extremely soft cutting



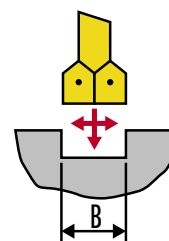
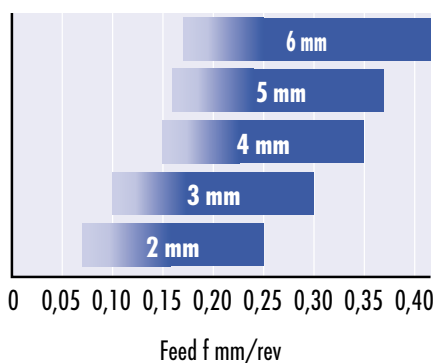
### Chip breaker TR-turning

- Special chip breaker for parting-off and recess turning
- Outstanding chip control for longitudinal turning
- For all steel and stainless materials



### Chip breaker R-round

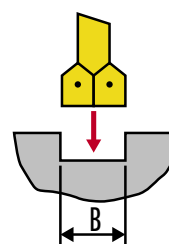
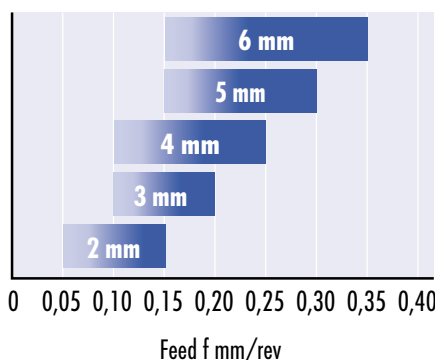
- Chip breaker for recess turning and ramping
- Rotating chip breaker for optimal chip control
- For all steel and stainless materials



**M, MU and MN chip breakers** are used in the **ASS** (ATORN Single Small) system. These refer to medium chip breakers, universal medium chip breakers, and chip breakers for medium non-ferrous metals.

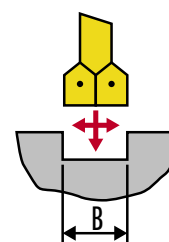
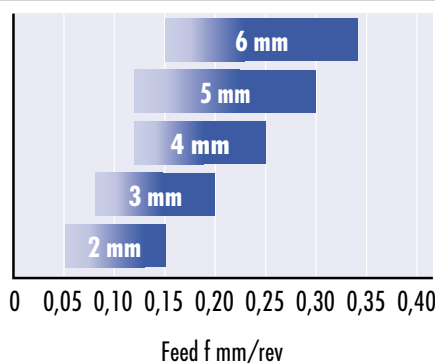
### Chip breaker M-medium

- Negative protective chamfer
- First choice for steel materials with high tensile strength
- Suitable for steel and grey cast iron
- Suitable for grooving and parting-off, as well as longitudinal turning



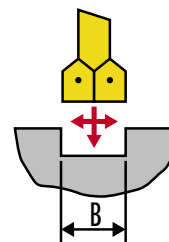
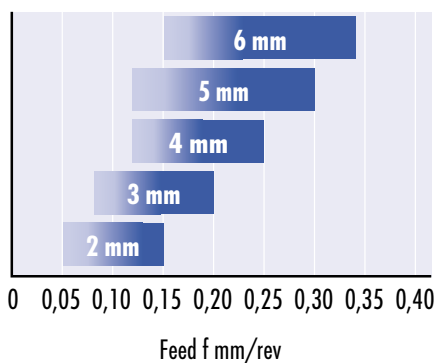
### Chip breaker MU medium-universal

- Recessing and recess turning
- Outstanding chip control
- Suitable for steel and cast iron



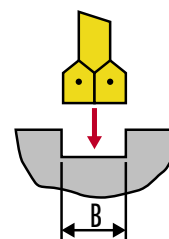
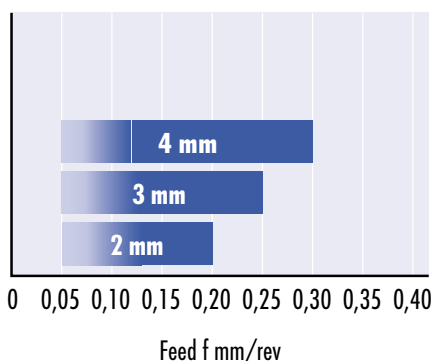
### Chip breaker MU medium-universal

- Recessing and recess turning
- Outstanding chip control
- Suitable for steel and cast iron



### Chip breaker MN, for aluminium machining

- Highly-positive chip breaker with sharp cutting edge finish
- Highly-polished chip breaker surface
- Maximum reduction of edge build-up



## ATORN® Range overview GROOVE

INFO

	Double-sided recessing inserts AD neutral	from page 993		Recessing blades AD / AE System	Page 1004		Cutting edge holder Modular axial ADA System	Page 1007
	Double-sided recessing inserts AD radius	Page 995		Recessing blades AD / AE System With internal cooling	Page 1004		Recessing inserts ASS	Page 1008
	Double-sided recessing inserts ADA axial	Page 996		Clamp mounting AD / AE System	Page 1005		Recessing blades ASS System	Page 1010
	Double-sided recessing inserts AD 6° right-hand	from page 996		Clamp mounting AD / AE System With internal cooling	Page 1005		Recessing blades ASS System With internal cooling	Page 1010
	Double-sided recessing inserts AD 6° left-hand	from page 998		Boring bars	Page 1006		Clamp mounting ASS System	Page 1011
	Single-sided recessing inserts AE neutral	from page 1000		Clamp mounting axial ADA System	Page 1006		Recessing blade holders	Page 1011
	Single-sided recessing inserts AE 6° right-hand	Page 1002		Clamp mounting Modular 0°/45°/90° AD / AE System	Page 1007			
	Single-sided recessing inserts SE 6° left-hand	Page 1003		Cutting edge holder Modular radial AD / AE System	Page 1007			

## ATORN® Recessing inserts AD neutral GROOVE

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy  $W \pm 0.02$  mm
- AD = double-edged cutting insert **max. 24 mm punching depth**
- AE = single-edged cutting insert **punching depth can be extended up to 50 mm depending on blade overhang**

### Chip breaker M - medium, universal

- For grooving
- Recessing insert with slightly negative edge rounding
- Suitable for almost all areas of application
- Main application area steel and cast iron

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 1.50-0.15 N-M	1.50	0.15	24	●	○	●				ACP 20 G	10 388030 1520	23,10
	1.50	0.15	24	●	●	●				APU 40 G	10 388030 1540	23,10
	1.50	0.15	24	○	●			●		APM 45 G	10 388030 1545	23,10
AD 2.00-0.2 N-M	2.00	0.2	24	●	○	●				ACP 20 G	10 388000 2035	18,55
	2.00	0.2	24	●	●	●				APU 40 G	10 388000 2040	18,55
	2.00	0.2	24	○	●			●		APM 45 G	10 388000 2045	18,55
AD 3.00-0.2 N-M	3.00	0.2	24	●	○	●				ACP 20 G	10 388000 3035	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388000 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388000 3045	20,30
AD 4.00-0.3 N-M	4.00	0.3	24	●	○	●				ACP 20 G	10 388000 4035	22,70
	4.00	0.3	24	●	●	●				APU 40 G	10 388000 4040	22,70
	4.00	0.3	24	○	●			●		APM 45 G	10 388000 4045	22,70
AD 5.00-0.4 N-M	5.00	0.4	24	●	○	●				ACP 20 G	10 388000 5035	30,80
	5.00	0.4	24	●	●	●				APU 40 G	10 388000 5040	30,80
	5.00	0.4	24	○	●			●		APM 45 G	10 388000 5045	30,80
AD 6.00-0.4 N-M	6.00	0.4	24	●	○	●				ACP 20 G	10 388000 6035	32,40
	6.00	0.4	24	●	●	●				APU 40 G	10 388000 6040	32,40
	6.00	0.4	24	○	●			●		APM 45 G	10 388000 6045	32,40

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.35		

### Chip breaker F - fine

- For grooving
- Excellent, very soft cutting geometry with very low cutting forces
- For materials with low minimum tensile strength
- Ideal for thin-walled components
- High cutting edge stability with ideal chip control even at low feed rates
- Low tendency to form built-up edges

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 2.00-0.2 N-F	2.00	0.2	24	●	○	●				ACP 20 G	10 388006 2020	18,55
	2.00	0.2	24	●	●	●				APU 40 G	10 388006 2040	18,55
	2.00	0.2	24	○	●			●		APM 45 G	10 388006 2045	18,55
AD 3.00-0.2 N-F	3.00	0.2	24	●	○	●				ACP 20 G	10 388006 3020	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388006 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388006 3045	20,30
AD 4.00-0.3 N-F	4.00	0.3	24	●	○	●				ACP 20 G	10 388006 4035	22,70
	4.00	0.3	24	●	●	●				APU 40 G	10 388006 4040	22,70
	4.00	0.3	24	○	●			●		APM 45 G	10 388006 4045	22,70
AD 5.00-0.4 N-F	5.00	0.4	24	●	○	●				APU 40 G	10 388006 5035	30,80
	5.00	0.4	24	○	●			●		APM 45 G	10 388006 5040	30,80
	5.00	0.4	24	●	○	●				ACP 20 G	10 388006 5045	30,80

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.03 - 0.27		

Continued on next page >>>

**Chip breaker ET - extra**

- For grooving
- Also for non-rusting materials
- "Problem-solver" for materials that are difficult to machine such as titanium or duplex
- Extremely soft cutting

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AD 1.50-0.15 N-ET	1.50	0.15	24	●	○	●				ACP 20 G	10 388031 1520	23,10
	1.50	0.15	24	●	●	●				APU 40 G	10 388031 1540	23,10
	1.50	0.15	24	○	●			●		APM 45 G	10 388031 1545	23,10
AD 2.00-0.2 N-ET	2.00	0.2	24	●	○	●				ACP 20 G	10 388012 2035	18,55
	2.00	0.2	24	●	●	●				APU 40 G	10 388012 2040	18,55
	2.00	0.2	24	○	●			●		APM 45 G	10 388012 2045	18,55
AD 3.00-0.2 N-ET	3.00	0.2	24	●	○	●				ACP 20 G	10 388012 3035	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388012 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388012 3045	20,30
AD 4.00-0.3 N-ET	4.00	0.3	24	●	○	●				ACP 20 G	10 388012 4035	22,70
	4.00	0.3	24	●	●	●				APU 40 G	10 388012 4040	22,70
	4.00	0.3	24	○	●			●		APM 45 G	10 388012 4045	22,70
AD 5.00-0.4 N-ET	5.00	0.4	24	●	○	●				ACP 20 G	10 388012 5035	30,80
	5.00	0.4	24	●	●	●				APU 40 G	10 388012 5040	30,80
	5.00	0.4	24	○	●			●		APM 45 G	10 388012 5045	30,80
AD 6.00-0.4 N-ET	6.00	0.4	24	●	○	●				ACP 20 G	10 388012 6035	32,40
	6.00	0.4	24	●	●	●				APU 40 G	10 388012 6040	32,40
	6.00	0.4	24	○	●			●		APM 45 G	10 388012 6045	32,40

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.27		

**Chip breaker TR - turning**

- For longitudinal turning and grooving
- Special chip breaker for parting-off and groove turning operations
- Outstanding chip control during longitudinal turning
- For all steel and stainless steel materials

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AD 2.00-0.2 N-TR	2.00	0.2	24	●	○	●				ACP 20 G	10 388024 2035	18,55
	2.00	0.2	24	●	●	●				APU 40 G	10 388024 2040	18,55
	2.00	0.2	24	○	●			●		APM 45 G	10 388024 2045	18,55
AD 3.00-0.2 N-TR	3.00	0.2	24	●	○	●				ACP 20 G	10 388024 3035	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388024 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388024 3045	20,30
AD 4.00-0.3 N-TR	4.00	0.3	24	●	○	●				ACP 20 G	10 388024 4035	22,70
	4.00	0.3	24	●	●	●				APU 40 G	10 388024 4040	22,70
	4.00	0.3	24	○	●			●		APM 45 G	10 388024 4045	22,70
AD 5.00-0.4 N-TR	5.00	0.4	24	●	○	●				ACP 20 G	10 388024 5035	30,80
	5.00	0.4	24	●	●	●				APU 40 G	10 388024 5040	30,80
	5.00	0.4	24	○	●			●		APM 45 G	10 388024 5045	30,80
AD 6.00-0.4 N-TR	6.00	0.4	24	●	○	●				ACP 20 G	10 388024 6035	32,40
	6.00	0.4	24	●	●	●				APU 40 G	10 388024 6040	32,40
	6.00	0.4	24	○	●			●		APM 45 G	10 388024 6045	32,40

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.26		

**Chip breaker LC**

- For longitudinal turning and grooving
- Cutting precision W +/- 0.02 mm

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 2.00-0.2 N-LC	2.00	0.2	24				●			AWN 16 G	10 388018 2016	27,40
AD 3.00-0.2 N-LC	3.00	0.2	24				●			AWN 16 G	10 388018 3016	29,50
AD 4.00-0.3 N-LC	4.00	0.3	24				●			AWN 16 G	10 388018 4016	35,50

ISO	AWN 16 G
ISO N Al/non-ferrous	Vc = 50 - 5000
Vc = [m/min] f = [mm/U]	f = 0.07 - 0.42

3139

**ATORN® Recessing inserts AD Radius GROOVE**

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy W ± 0.02mm
- AD = double-edged cutting insert **max. 24 mm punching depth**

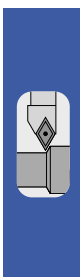
**Chip breaker R - round**

- For longitudinal turning and grooving
- Chip breaker for recess turning and ramping
- Rotating chip breaker for optimal chip control
- For all steel and stainless steel materials

ISO designation	Width mm	r mm	T max. mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 2.00-1.0 R	2.00	1.0	24	●	○	●				ACP 20 G	10 388025 2035	18,55
	2.00	1.0	24	●	○	●				APU 40 G	10 388025 2040	18,55
	2.00	1.0	24	○	○			●		APM 45 G	10 388025 2045	18,55
AD 3.00-1.5 R	3.00	1.5	24	●	○	●				ACP 20 G	10 388025 3035	20,30
	3.00	1.5	24	●	○	●				APU 40 G	10 388025 3040	20,30
	3.00	1.5	24	○	○			●		APM 45 G	10 388025 3045	20,30
AD 4.00-2.0 R	4.00	2.0	24	●	○	●				ACP 20 G	10 388025 4035	26,90
	4.00	2.0	24	●	○	●				APU 40 G	10 388025 4040	26,90
	4.00	2.0	24	○	○			●		APM 45 G	10 388025 4045	26,90
AD 5.00-2.5 R	5.00	2.5	24	●	○	●				ACP 20 G	10 388025 5035	30,80
	5.00	2.5	24	●	○	●				APU 40 G	10 388025 5040	30,80
	5.00	2.5	24	○	○			●		APM 45 G	10 388025 5045	30,80
AD 6.00-3.0 R	6.00	3.0	24	●	○	●				ACP 20 G	10 388025 6035	32,40
	6.00	3.0	24	●	○	●				APU 40 G	10 388025 6040	32,40
	6.00	3.0	24	○	○			●		APM 45 G	10 388025 6045	32,40

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.07 - 0.25	f = 0.15 - 0.35	



Precision ...

... but digital.

**ATORN®**  
Performance demands quality

## ATORN® Recessing inserts ADA Axial GROOVE

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy  $W \pm 0.02\text{mm}$
- ADA = double-edged cutting insert
- Punching depth depends on the selected recessing tool

### Chip breaker TR

- For axial grooving
- Rotating chip breaker for optimal chip control
- For all steel and stainless steel materials

ISO designation	Width mm	max. depth mm	r mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
ADA 3.00-0.3 N-TR	3.00	15	0.3	●	○	●				ACP 20 G	10 388040 3020	23,40
	3.00	15	0.3	●	●	●				APU 40 G	10 388040 3040	23,40
	3.00	15	0.3	○	●			●		APM 45 G	10 388040 3045	23,40
ADA 4.00-0.4 N-TR	4.00	15	0.4	●	○	●				ACP 20 G	10 388040 4020	26,30
	4.00	15	0.4	●	●	●				APU 40 G	10 388040 4040	26,30
	4.00	15	0.4	○	●			●		APM 45 G	10 388040 4045	26,30

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.15		

## ATORN® Recessing inserts AD right-hand GROOVE

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy  $W \pm 0.02\text{ mm}$
- AD = double-edged cutting insert **max. 24 mm punching depth**
- AE = single-edged cutting insert **punching depth can be extended up to 50 mm depending on blade overhang**
- Optional right  $6^\circ$

### Chip breaker M - medium, universal

- For grooving
- Recessing insert with slightly negative edge rounding
- Suitable for almost all areas of application
- Main application area steel and cast iron



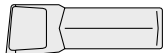
ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AD 2.00-0.15 R6-M	2.00	0.15	24	●	○	●				ACP 20 G	10 388001 2035	18,55
	2.00	0.15	24	●	●	●				APU 40 G	10 388001 2040	18,55
	2.00	0.15	24	○	●			●		APM 45 G	10 388001 2045	18,55
AD 3.00-0.2 R6-M	3.00	0.2	24	●	○	●				ACP 20 G	10 388001 3035	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388001 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388001 3045	20,30
AD 4.00-0.3 R6-M	4.00	0.3	24	●	○	●				ACP 20 G	10 388001 4035	22,70
	4.00	0.3	24	●	●	●				APU 40 G	10 388001 4040	22,70
	4.00	0.3	24	○	●			●		APM 45 G	10 388001 4045	22,70

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.35		

## ISO designation recessing inserts (examples)

INFO

ISO designation	Punching width	Corner radius	Version	Setting angle	Chip breaker	Figure
AD 3.00-0.2-N-M	3.00 mm	0.2 mm	N = Neutral	$0^\circ$	M	
AD 2.00-0.2-R6-ET	2.00 mm	0.2 mm	R = right-hand	$6^\circ$	ET	
AD 4.00-0.3-L6-F	4.00 mm	0.3 mm	L = left-hand	$6^\circ$	F	



**Chip breaker F - fine**

- For grooving
- Excellent, very soft cutting geometry with very low cutting forces
- For materials with low minimum tensile strength
- Ideal for thin-walled components
- High cutting edge stability with ideal chip control even at low feed rates
- Low tendency to form built-up edges

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 2.00-0.2 R6-F	2.00	0.2	24	●	○	●				ACP 20 G	10 388007 2020	18,55
	2.00	0.2	24	●	●	●				APU 40 G	10 388007 2040	18,55
	2.00	0.2	24	○	●			●		APM 45 G	10 388007 2045	18,55
AD 3.00-0.2 R6-F	3.00	0.2	24	●	○	●				ACP 20 G	10 388007 3020	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388007 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388007 3045	20,30
AD 4.00-0.3 R6-F	4.00	0.3	24	●	○	●				ACP 20 G	10 388007 4020	26,90
	4.00	0.3	24	●	●	●				APU 40 G	10 388007 4040	26,90
	4.00	0.3	24	○	●			●		APM 45 G	10 388007 4045	26,90

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.03 - 0.27		

**Chip breaker ET - extra**

- For grooving
- Also for non-rusting materials
- "Problem-solver" for materials that are difficult to machine such as titanium or duplex
- Extremely soft cutting

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 2.00-0.2 R6-ET	2.0	0.2	24	●	○	●				ACP 20 G	10 388013 2035	18,55
	2.0	0.2	24	●	●	●				APU 40 G	10 388013 2040	18,55
	2.0	0.2	24	○	●			●		APM 45 G	10 388013 2045	18,55
AD 3.00-0.2 R6-ET	3.0	0.2	24	●	○	●				ACP 20 G	10 388013 3035	20,30
	3.0	0.2	24	●	●	●				APU 40 G	10 388013 3040	20,30
	3.0	0.2	24	○	●			●		APM 45 G	10 388013 3045	20,30
AD 4.00-0.3 R6-ET	4.0	0.3	24	●	○	●				ACP 20 G	10 388013 4020	26,90
	4.0	0.3	24	●	●	●				APU 40 G	10 388013 4040	26,90
	4.0	0.3	24	○	●			●		APM 45 G	10 388013 4045	26,90

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.27		

**Chip breaker TR - turning**

- For longitudinal turning and grooving
- Special chip breaker for parting-off and recess turning
- Outstanding chip control for longitudinal turning
- For all steel and stainless steel materials

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 2.00-0.2 R6-TR	2.00	0.2	24	●	○	●				ACP 20 G	10 388067 2020	18,85
	2.00	0.2	24	●	●	●				APU 40 G	10 388067 2040	18,85
	2.00	0.2	24	○	●			●		APM 45 G	10 388067 2045	18,85
AD 3.00-0.3 R6-TR	3.00	0.3	24	●	○	●				ACP 20 G	10 388067 3020	20,70
	3.00	0.3	24	●	●	●				APU 40 G	10 388067 3040	20,70
	3.00	0.3	24	○	●			●		APM 45 G	10 388067 3045	20,70

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.26		

## ATORN® Recessing inserts AD left-hand GROOVE

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy  $W \pm 0.02$  mm
- AD = double-edged cutting insert **max. 24 mm punching depth**
- AE = single-edged cutting insert **punching depth can be extended up to 50 mm depending on blade overhang**
- Optional left 6°

### Chip breaker M - medium, universal

- For grooving
- Recessing insert with slightly negative edge rounding
- Suitable for almost all areas of application
- Main application area steel and cast iron

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 2.00-0.2 L6-M	2.00	0.2	24	●	○	●				ACP 20 G	10 388002 2035	18,55
	2.00	0.2	24	●	●	●				APU 40 G	10 388002 2040	18,55
	2.00	0.2	24	○	●			●		APM 45 G	10 388002 2045	18,55
AD 3.00-0.2 L6-M	3.00	0.2	24	●	○	●				ACP 20 G	10 388002 3035	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388002 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388002 3045	20,30
AD 4.00-0.3 L6-M	4.00	0.3	24	●	○	●				ACP 20 G	10 388002 4035	26,90
	4.00	0.3	24	●	●	●				APU 40 G	10 388002 4040	26,90
	4.00	0.3	24	○	●			●		APM 45 G	10 388002 4045	26,90

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.35		

### Chip breaker F - fine

- For grooving
- Excellent, very soft cutting geometry with very low cutting forces
- For materials with low minimum tensile strength
- Ideal for thin-walled components
- High cutting edge stability with ideal chip control even at low feed rates
- Low tendency to form built-up edges

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AD 2.00-0.2 L6-F	2.00	0.2	24	●	○	●				ACP 20 G	10 388008 2020	18,55
	2.00	0.2	24	●	●	●				APU 40 G	10 388008 2040	18,55
	2.00	0.2	24	○	●			●		APM 45 G	10 388008 2045	18,55
AD 3.00-0.2 L6-F	3.00	0.2	24	●	○	●				ACP 20 G	10 388008 3020	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388008 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388008 3045	20,30
AD 4.00-0.3 L6-F	4.00	0.3	24	●	○	●				ACP 20 G	10 388008 4020	26,90
	4.00	0.3	24	●	●	●				APU 40 G	10 388008 4040	26,90
	4.00	0.3	24	○	●			●		APM 45 G	10 388008 4045	26,90

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 50 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.03 - 0.27		



Grooving from 2 mm ...

... with internal cooling.

**ATORN®**  
Performance demands quality

**Chip breaker ET - extra**

- For grooving
- Also for non-rusting materials
- "Problem-solver" for materials that are difficult to machine such as titanium or duplex
- Extremely soft cutting

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AD 2.00-0.2 L6-ET	2.00	0.2	24	●	○	●				ACP 20 G	10 388014 2035	18,55
	2.00	0.2	24	●	●	●				APU 40 G	10 388014 2040	18,55
	2.00	0.2	24	○	●			●		APM 45 G	10 388014 2045	18,55
AD 3.00-0.2 L6-ET	3.00	0.2	24	●	○	●				ACP 20 G	10 388014 3035	20,30
	3.00	0.2	24	●	●	●				APU 40 G	10 388014 3040	20,30
	3.00	0.2	24	○	●			●		APM 45 G	10 388014 3045	20,30
AD 4.00-0.3 L6-ET	4.00	0.3	24	●	○	●				ACP 20 G	10 388014 4020	26,90
	4.00	0.3	24	●	●	●				APU 40 G	10 388014 4040	26,90
	4.00	0.3	24	○	●			●		APM 45 G	10 388014 4045	26,90

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.27		

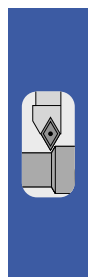
**Chip breaker TR - turning**

- For longitudinal turning and grooving
- Special chip breaker for parting-off and recess turning
- Outstanding chip control for longitudinal turning
- For all steel and stainless steel materials

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AD 2.00-0.2 L6-TR	2.00	0.2	24	●	○	●				ACP 20 G	10 388066 2020	18,85
	2.00	0.2	24	●	●	●				APU 40 G	10 388066 2040	18,85
	2.00	0.2	24	○	●			●		APM 45 G	10 388066 2045	18,85
AD 3.00-0.3 L6-TR	3.00	0.3	24	●	○	●				ACP 20 G	10 388066 3020	20,70
	3.00	0.3	24	●	●	●				APU 40 G	10 388066 3040	20,70
	3.00	0.3	24	○	●			●		APM 45 G	10 388066 3045	20,70

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.26		



**ISO designation recessing inserts (examples)**

**INFO**

ISO designation	Punching width	Corner radius	Version	Setting angle	Chip breaker	Figure
AD 3.00-0.2-N-M	3.00 mm	0.2 mm	N = Neutral	0°	M	
AD 2.00-0.2-R6-ET	2.00 mm	0.2 mm	R = right-hand	6°	ET	
AD 4.00-0.3-L6-F	4.00 mm	0.3 mm	L = left-hand	6°	F	

## ATORN® Recessing inserts AE neutral GROOVE

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy  $W \pm 0.02$  mm
- AD = double-edged cutting insert **max. 24 mm punching depth**
- AE = single-edged cutting insert **punching depth can be extended up to 50 mm depending on blade overhang**

### Chip breaker M - medium, universal

- For grooving
- Recessing insert with slightly negative edge rounding
- Suitable for almost all areas of application
- Main application area steel and cast iron

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AE 2.00-0.2 N-M	2.00	0.2	50	●	○	●				ACP 20 G	10 388003 2020	16,60
	2.00	0.2	50	●	○	○				APU 40 G	10 388003 2040	16,60
	2.00	0.2	50	○	●			●		APM 45 G	10 388003 2045	17,70
AE 3.00-0.2 N-M	3.00	0.2	50	●	○	●				ACP 20 G	10 388003 3020	18,15
	3.00	0.2	50	●	○	○				APU 40 G	10 388003 3040	18,15
	3.00	0.2	50	○	●			●		APM 45 G	10 388003 3045	18,15
AE 4.00-0.3 N-M	4.00	0.3	50	●	○	●				ACP 20 G	10 388003 4020	20,60
	4.00	0.3	50	●	○	○				APU 40 G	10 388003 4040	20,60
	4.00	0.3	50	○	●			●		APM 45 G	10 388003 4045	20,60

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.08 - 0.3		

### Chip breaker F - fine

- For grooving
- Excellent, very soft cutting geometry with very low cutting forces
- For materials with low minimum tensile strength
- Ideal for thin-walled components
- High cutting edge stability with ideal chip control even at low feed rates
- Low tendency to form built-up edges

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AE 2.00-0.2 N-F	2.00	0.2	50	●	○	●				ACP 20 G	10 388009 2020	17,70
	2.00	0.2	50	●	○	○				APU 40 G	10 388009 2040	18,55
	2.00	0.2	50	○	●			●		APM 45 G	10 388009 2045	17,70
AE 3.00-0.2 N-F	3.00	0.2	50	●	○	●				ACP 20 G	10 388009 3020	18,15
	3.00	0.2	50	●	○	○				APU 40 G	10 388009 3040	20,30
	3.00	0.2	50	○	●			●		APM 45 G	10 388009 3045	18,15
AE 4.00-0.3 N-F	4.00	0.3	50	●	○	●				ACP 20 G	10 388009 4020	20,60
	4.00	0.3	50	●	○	○				APU 40 G	10 388009 4040	20,60
	4.00	0.3	50	○	●			●		APM 45 G	10 388009 4045	20,60

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.03 - 0.27		



Drilling and turning ...

... with a single tool.

**ATORN®**  
Performance demands quality

**Chip breaker ET - extra**

- For grooving
- Also for non-rusting materials
- "Problem-solver" for materials that are difficult to machine such as titanium or duplex
- Extremely soft cutting

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AE 2.00-0.2 N-ET	2.00	0.2	50	●	○	●				ACP 20 G	10 388015 2020	17,70
	2.00	0.2	50	●	●	●				APU 40 G	10 388015 2040	17,70
	2.00	0.2	50	○	●			●		APM 45 G	10 388015 2045	17,70
AE 3.00-0.2 N-ET	3.00	0.2	50	●	○	●				ACP 20 G	10 388015 3020	18,15
	3.00	0.2	50	●	●	●				APU 40 G	10 388015 3040	18,15
	3.00	0.2	50	○	●			●		APM 45 G	10 388015 3045	18,15
AE 4.00-0.3 N-ET	4.00	0.3	50	●	○	●				ACP 20 G	10 388015 4020	20,60
	4.00	0.3	50	●	●	●				APU 40 G	10 388015 4040	20,60
	4.00	0.3	50	○	●			●		APM 45 G	10 388015 4045	22,-

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 180
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.27		

**Chip breaker TR - turning**

- For longitudinal turning and grooving
- Special chip breaker for parting-off and groove turning operations
- Outstanding chip control during longitudinal turning
- For all steel and stainless steel materials

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AE 2.00-0.2 N-TR	2.00	0.2	50	●	○	●				ACP 20 G	10 388068 2020	17,70
	2.00	0.2	50	●	●	●				APU 40 G	10 388068 2040	17,70
	2.00	0.2	50	○	●			●		APM 45 G	10 388068 2045	17,70
AE 3.00-0.3 N-TR	3.00	0.3	50	●	○	●				ACP 20 G	10 388029 3020	18,15
	3.00	0.3	50	●	●	●				APU 40 G	10 388029 3040	18,15
	3.00	0.3	50	○	●			●		APM 45 G	10 388029 3045	18,15
AE 4.00-0.4 N-TR	4.00	0.4	50	●	○	●				ACP 20 G	10 388029 4020	20,60
	4.00	0.4	50	●	●	●				APU 40 G	10 388029 4040	20,60
	4.00	0.4	50	○	●			●		APM 45 G	10 388029 4045	20,60

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.06 - 0.26		

**Chip breaker LC**

- For longitudinal turning and grooving
- Cutting precision W +/- 0.02 mm

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AE 2.00-0.2 N-LC	2.00	0.2	50				●			AWN 16 G	10 388021 2016	22,30
AE 3.00-0.2 N-LC	3.00	0.2	50				●			AWN 16 G	10 388021 3016	24,40
AE 4.00-0.3 N-LC	4.00	0.3	50				●			AWN 16 G	10 388021 4016	30,80

3139

ISO	AWN 16 G
ISO N Al/non-ferrous	Vc = 50 - 5000
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.30

## ATORN® Recessing inserts AE right-hand GROOVE

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy  $W \pm 0.02$  mm
- AD = double-edged cutting insert **max. 24 mm punching depth**
- AE = single-edged cutting insert **punching depth can be extended up to 50 mm depending on blade overhang**
- Optional right  $\delta^\circ$

### Chip breaker M - medium, universal

- For grooving
- Recessing insert with slightly negative edge rounding
- Suitable for almost all areas of application
- Main application area steel and cast iron

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AE 2.00-0.15 R6-M	2.00	0.15	50	●	○	●				ACP 20 G	10 388004 2020	17,70
	2.00	0.15	50	●	●	●				APU 40 G	10 388004 2040	17,70
	2.00	0.15	50	○	●			●		APM 45 G	10 388004 2045	17,70
AE 3.00-0.2 R6-M	3.00	0.2	50	●	○	●				ACP 20 G	10 388004 3020	18,-
	3.00	0.2	50	●	●	●				APU 40 G	10 388004 3040	18,-
	3.00	0.2	50	○	●			●		APM 45 G	10 388004 3045	18,-

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.35		

### Chip breaker F - fine

- For grooving
- Excellent, very soft cutting geometry with very low cutting forces
- For materials with low minimum tensile strength
- Ideal for thin-walled components
- High cutting edge stability with ideal chip control even at low feed rates
- Low tendency to form built-up edges

ISO designation	Width mm	r mm	max. depth mm	ISO						Quality	art.no.	€
				ISO P	ISO M	ISO K	ISO N	ISO S	ISO H			
AE 2.00-0.15 R6-F	2.00	0.15	50	●	○	●				ACP 20 G	10 388010 2020	17,70
	2.00	0.15	50	●	●	●				APU 40 G	10 388010 2040	17,70
	2.00	0.15	50	○	●			●		APM 45 G	10 388010 2045	17,70
AE 3.00-0.2 R6-F	3.00	0.2	50	●	○	●				ACP 20 G	10 388010 3020	18,-
	3.00	0.2	50	●	●	●				APU 40 G	10 388010 3040	18,-
	3.00	0.2	50	○	●			●		APM 45 G	10 388010 3045	18,-

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.03 - 0.27		

## ISO designation recessing inserts (examples)

INFO

ISO designation	Punching width	Corner radius	Version	Setting angle	Chip breaker	Figure
AD 3.00-0.2-N-M	3.00 mm	0.2 mm	N = Neutral	0°	M	
AD 2.00-0.2-R6-ET	2.00 mm	0.2 mm	R = right-hand	6°	ET	
AD 4.00-0.3-L6-F	4.00 mm	0.3 mm	L = left-hand	6°	F	

## ATORN® Recessing inserts AE left-hand GROOVE

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy  $W \pm 0.02$  mm
- AD = double-edged cutting insert **max. 24 mm punching depth**
- AE = single-edged cutting insert **punching depth can be extended up to 50 mm depending on blade overhang**
- Optional left  $6^\circ$

### Chip breaker M - medium, universal

- For grooving
- Recessing insert with slightly negative edge rounding
- Suitable for almost all areas of application
- Main application area steel and cast iron

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AE 2.00-0.15 L6-M	2.00	0.15	50	●	○	●				ACP 20 G	10 388005 2020	17,70
	2.00	0.15	50	●	●	●				APU 40 G	10 388005 2040	17,70
	2.00	0.15	50	○	●			●		APM 45 G	10 388005 2045	17,70
AE 3.00-0.2 L6-M	3.00	0.2	50	●	○	●				ACP 20 G	10 388005 3020	18,-
	3.00	0.2	50	●	●	●				APU 40 G	10 388005 3040	18,-
	3.00	0.2	50	○	●			●		APM 45 G	10 388005 3045	18,-

3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.35		

### Chip breaker F - fine

- For grooving
- Excellent, very soft cutting geometry with very low cutting forces
- For materials with low minimum tensile strength
- Ideal for thin-walled components
- High cutting edge stability with ideal chip control even at low feed rates
- Low tendency to form built-up edges

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
AE 2.00-0.15 L6-F	2.00	0.15	50	●	○	●				ACP 20 G	10 388011 2020	17,70
	2.00	0.15	50	●	●	●				APU 40 G	10 388011 2040	17,70
	2.00	0.15	50	○	●			●		APM 45 G	10 388011 2045	17,70
AE 3.00-0.2 L6-F	3.00	0.2	50	●	○	●				ACP 20 G	10 388011 3020	18,-
	3.00	0.2	50	●	●	●				APU 40 G	10 388011 3040	18,-
	3.00	0.2	50	○	●			●		APM 45 G	10 388011 3045	18,-

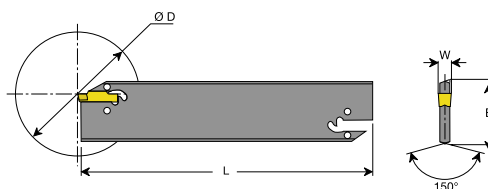
3139

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 50 - 240	Vc = 40 - 120	Vc = 50 - 240
ISO M stainless steel	Vc = 50 - 180	Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 200		Vc = 80 - 200
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.03 - 0.27		



## ATORN® Recessing blades GROOVE

- for recessing inserts System AD / AE
- for parting-off and deep grooving
- Supplied without chuck key



### Recessing blade ABE right-hand / left-hand

ISO designation	B mm	L mm	W mm	suitable cutting inserts	D max. mm	suitable wrench	Right-hand		Left-hand	
							art.no.	€	art.no.	€
ABE R/L 26-ADE02	26	150	2.00	System AD/AE 2.0	42	3565000030	<b>356006</b> 2602	124,50	<b>356007</b> 2602	124,50
ABE R/L 32-ADE02	32	150	2.00	System AD/AE 2.0	42	3565000030	356006 3202	124,50	356007 3202	124,50
							3138		3138	



### Recessing blade ABE neutral

ISO designation	B mm	L mm	W mm	suitable cutting inserts	D max. mm	suitable wrench	art.no.		€
ABE N 26-ADE02	26	150	2.0	System AD/AE 2.0	50	3565000030	<b>356005</b> 2602	119,-	
ABE N 26-ADE03	26	150	3.0	System AD/AE 3.0	70	3565000030	356005 2603	103,-	
ABE N 26-ADE04	26	150	4.0	System AD/AE 4.0	80	3565000040	356005 2604	112,-	
ABE N 32-ADE02	32	150	2.0	System AD/AE 2.0	50	3565000030	356005 3202	120,50	
ABE N 32-ADE03	32	150	3.0	System AD/AE 3.0	100	3565000030	356005 3203	103,-	
ABE N 32-ADE04	32	150	4.0	System AD/AE 4.0	100	3565000040	356005 3204	113,-	
							3138		



### Recessing blade ABE with internal cooling

ISO designation	B mm	L mm	W mm	suitable cutting inserts	D max. mm	suitable wrench	art.no.		€
ABE N 26-ADE02-C	26	150	2.0	System AD/AE 2.0	50	3565000030	<b>356050</b> 2602	199,50	
ABE N 26-ADE03-C	26	150	3.0	System AD/AE 3.0	70	3565000030	356050 2603	190,50	
ABE N 26-ADE04-C	26	150	4.0	System AD/AE 4.0	80	3565000040	356050 2604	226,-	
ABE N 32-ADE02-C	32	150	2.0	System AD/AE 2.0	50	3565000030	356050 3202	187,50	
ABE N 32-ADE03-C	32	150	3.0	System AD/AE 3.0	100	3565000030	356050 3203	195,50	
ABE N 32-ADE04-C	32	150	4.0	System AD/AE 4.0	100	3565000040	356050 3204	221,-	
							3138		



### Recessing blade ABE R/L with internal cooling

ISO designation	B mm	L mm	W mm	suitable cutting inserts	D max. mm	suitable wrench	Right-hand		Left-hand	
							art.no.	€	art.no.	€
ABE-R/L 26-ADE02-C	26	150	2.0	System AD/AE 2.0	50	3565000030	<b>356008</b> 2602	221,-	<b>356009</b> 2602	221,-
ABE-R/L 32-ADE02-C	32	150	2.0	System AD/AE 2.0	50	3565000030	356008 3202	273,-	356009 3202	273,-
							3138		3138	

### Chuck key

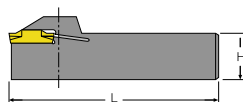
ISO designation	Chuck key art.no.	€
Wrench blade 2-3 mm system ASS/ABE/AD/AE	<b>356500</b> 0030	40,70
Wrench blade 4-6 mm system ASS/ABE/AD/AE	356500 0040	40,70

3106



## ATORN® Recess clamp mounting GROOVE

- for recessing inserts System AD / AE
- for longitudinal turning and grooving
- Supplied with chuck key



### Clamp mounting AME 1.5mm R/L

- for recessing inserts System AD 1.5mm

ISO designation	H mm	B mm	L mm	W mm	max. depth mm	suitable cutting inserts	Right-hand		Left-hand	
							art.no.	€	art.no.	€
AME-R/L 12-ADE1,5-KT23	12	12	125	1.5	23	System AD/AE 1.5	<b>356008</b> 1501	<b>121,50</b>	<b>356009</b> 1501	<b>121,50</b>
AME-R/L 16-ADE1,5-KT23	16	16	125	1.5	23	System AD/AE 1.5	356008 1502	<b>124,50</b>	356009 1502	<b>124,50</b>
							3138		3138	



### Clamp mounting AME right-hand / left-hand

ISO designation	H mm	B mm	L mm	W mm	max. depth mm	suitable cutting inserts	Tightening torque max. N-m	Right-hand		Left-hand	
								art.no.	€	art.no.	€
AME-R/L 12 ADE02-T13	12	12	125	2.0	13	System AD/AE 2.0	3.2	<b>356001</b> 2001	<b>84,50</b>	<b>356002</b> 2001	<b>84,50</b>
AME-R/L 12 ADE03-T13	12	12	125	3.0	13	System AD/AE 3.0	3.2	356001 3001	<b>84,50</b>	356002 3001	<b>84,50</b>
AME-R/L 16 ADE02-T13	16	16	125	2.0	13	System AD/AE 2.0	4.0	356001 2002	<b>94,60</b>	356002 2002	<b>94,60</b>
AME-R/L 16 ADE03-T13	16	16	125	3.0	13	System AD/AE 3.0	4.0	356001 3002	<b>94,60</b>	356002 3002	<b>94,60</b>
AME-R/L 16 ADE03-T25	16	16	125	3.0	25	System AD/AE 3.0	4.0	356001 3008	<b>115,-</b>	356002 3008	<b>115,-</b>
AME-R/L 16 ADE04-T25	16	16	125	4.0	25	System AD/AE 4.0	4.0	356001 4001	<b>115,-</b>	356002 4001	<b>115,-</b>
AME-R/L 20 ADE02-T13	20	20	125	2.0	13	System AD/AE 2.0	4.0	356001 2003	<b>108,-</b>	356002 2003	<b>108,-</b>
AME-R/L 20 ADE03-T13	20	20	125	3.0	13	System AD/AE 3.0	4.0	356001 3004	<b>110,-</b>	356002 3004	<b>110,-</b>
AME-R/L 20 ADE03-T25	20	20	125	3.0	25	System AD/AE 3.0	4.0	356001 3005	<b>118,-</b>	356002 3005	<b>118,-</b>
AME-R/L 20 ADE04-T25	20	20	125	4.0	25	System AD/AE 4.0	4.0	356001 4002	<b>117,-</b>	356002 4002	<b>117,-</b>
AME-R/L 20 ADE05-T25	20	20	150	5.0	25	System AD/AE 5.0	4.0	356001 5002	<b>117,-</b>	356002 5002	<b>117,-</b>
AME-R/L 20 ADE06-T25	20	20	150	6.0	25	System AD/AE 6.0	4.0	356001 6001	<b>117,-</b>	356002 6001	<b>117,-</b>
AME-R/L 25 ADE03-T13	25	25	125	3.0	13	System AD/AE 3.0	4.8	356001 3006	<b>115,-</b>	356002 3006	<b>115,-</b>
AME-R/L 25 ADE03-T25	25	25	125	3.0	25	System AD/AE 3.0	4.8	356001 3007	<b>125,50</b>	356002 3007	<b>125,50</b>
AME-R/L 25 ADE04-T25	25	25	125	4.0	25	System AD/AE 4.0	4.8	356001 4003	<b>124,50</b>	356002 4003	<b>124,50</b>
AME-R/L 25 ADE05-T25	25	25	150	5.0	25	System AD/AE 5.0	4.8	356001 5003	<b>124,50</b>	356002 5003	<b>124,50</b>
AME-R/L 25 ADE06-T25	25	25	150	6.0	25	System AD/AE 6.0	4.8	356001 6002	<b>124,50</b>	356002 6002	<b>124,50</b>
								3138		3138	



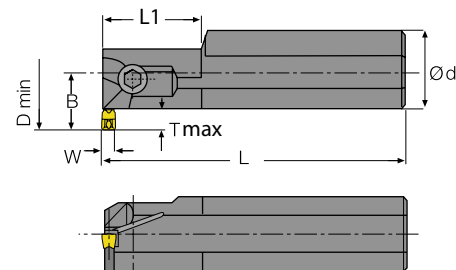
### Clamp mounting AME right-hand / left-hand with internal cooling

ISO designation	H mm	B mm	L mm	W mm	t max. mm	suitable cutting inserts	Tightening torque max. N-m	Right-hand		Left-hand	
								art.no.	€	art.no.	€
AME-R/L 20-ADE02-K-T13 IK	20	20	125	2.0	13	System AD/AE 2.0	4.0	<b>356003</b> 0011	<b>183,50</b>	<b>356004</b> 0011	<b>183,50</b>
AME-R/L 16-ADE02-K-T13 IK	16	16	125	2.0	13	System AD/AE 3.0	4.0	356003 0009	<b>173,-</b>	356004 0009	<b>173,-</b>
AME-R/L 16-ADE03-K-T25 IK	16	16	125	3.0	25	System AD/AE 3.0	4.0	356003 0008	<b>182,50</b>	356004 0008	<b>182,50</b>
AME-R/L 20-ADE03-K-T25 IK	20	20	125	3.0	25	System AD/AE 3.0	4.0	356003 0005	<b>194,50</b>	356004 0005	<b>194,50</b>
AME-R/L 25-ADE03-K-T25 IK	25	25	125	3.0	25	System AD/AE 3.0	4.8	356003 0007	<b>211,-</b>	356004 0007	<b>211,-</b>
AME-R/L 16-ADE04-K-T25 IK	16	16	125	4.0	25	System AD/AE 4.0	4.0	356003 0010	<b>182,50</b>	356004 0010	<b>182,50</b>
AME-R/L 20-ADE04-K-T25 IK	20	20	125	4.0	25	System AD/AE 4.0	4.0	356003 0012	<b>194,50</b>	356004 0012	<b>194,50</b>
AME-R/L 25-ADE04-K-T25 IK	25	25	125	4.0	25	System AD/AE 4.0	4.8	356003 0013	<b>211,-</b>	356004 0013	<b>211,-</b>
								3138		3138	

## ATORN® Boring bar GROOVE

**NEW**


- Internal turning and recessing
- **With internal coolant supply**
- For use with recessing inserts of type **AD and AE**



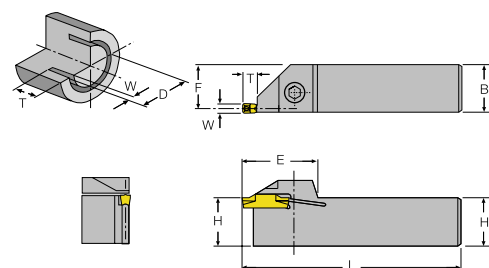
### Boring bar AMI R/L

Designation	d mm	D min. mm	L1 mm	L mm	B mm	T max. mm	W mm	suitable cutting inserts	Tightening torque max. N-m	A1	B1	Right-hand		Left-hand	
												art.no.	€	art.no.	€
AMI... 25-2	25	31.1	52	200	21	8	2	System AD/AE 2.0	5	A1	B1	<b>356030</b> 2502	216,-	<b>356031</b> 2502	216,-
AMI... 25-3	25	31.1	52	200	22	9	3	System AD/AE 3.0	5	A1	B1	356030 2503	216,-	356031 2503	216,-
AMI... 32-3	32	41	64	250	27.5	11	3	System AD/AE 3.0	5	A1	B1	356030 3203	241,-	356031 3203	241,-
AMI... 32-4	32	41	64	250	27.5	11	4	System AD/AE 4.0	5	A1	B1	356030 3204	241,-	356031 3204	241,-
AMI... 40-4	40	51.7	80	300	32.5	12	4	System AD/AE 4.0	5	A1	B1	356030 4004	278,-	356031 4004	278,-
AMI... 40-5	40	51.7	80	300	32.5	12	5	System AD/AE 5.0	5	A1	B1	356030 4005	278,-	356031 4005	278,-
												3138		3138	

### Spare parts

Screw			Steel grey		
	art.no.	€		art.no.	€
A1	356100 0014	7,85	B1	703038 0200	2,29
		3164			7111

## ATORN® Recess clamp mounting GROOVE AXIAL



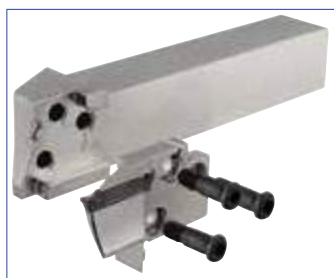
### Clamp mounting AMA Axial R/L

- **for recessing inserts System ADA**
- for axial grooving, Ø 40 - 200mm
- Supplied with chuck key

ISO designation	Shank height mm	Shank width mm	L mm	W mm	max. depth mm	D mm	suitable cutting inserts	Right-hand		Left-hand		
								art.no.	€	art.no.	€	
AMA- 25-40-3 T13	25	25	150	3.0	13.0	40-50	System ADA 3.0	<b>356010</b> 0001	226,-	<b>356011</b> 0001	226,-	
AMA- 25-50-3 T13	25	25	150	3.0	13.0	50-60	System ADA 3.0	356010 0002	226,-	356011 0002	226,-	
AMA- 25-60-3 T13	25	25	150	3.0	13.0	60-75	System ADA 3.0	356010 0003	226,-	356011 0003	226,-	
AMA- 25-75-3 T13	25	25	150	3.0	13.0	75-100	System ADA 3.0	356010 0004	226,-	356011 0004	226,-	
AMA- 25-100-3 T13	25	25	150	3.0	13.0	100-140	System ADA 3.0	356010 0005	226,-	356011 0005	226,-	
AMA- 25-140-3 T13	25	25	150	3.0	13.0	140-200	System ADA 3.0	356010 0006	226,-	356011 0006	226,-	
AMA- 25-100-4 T13	25	25	150	4.0	13.0	100-140	System ADA 4.0	356010 0011	226,-	356011 0011	226,-	
AMA- 25-140-4 T13	25	25	150	4.0	13.0	140-200	System ADA 4.0	356010 0012	226,-	356011 0012	226,-	
AMA- 25-40-4 T13	25	25	150	4.0	13.0	40-50	System ADA 4.0	356010 0007	226,-	356011 0007	226,-	
AMA- 25-50-4 T13	25	25	150	4.0	13.0	50-60	System ADA 4.0	356010 0008	226,-	356011 0008	226,-	
AMA- 25-60-4 T13	25	25	150	4.0	13.0	60-75	System ADA 4.0	356010 0009	226,-	356011 0009	226,-	
AMA- 25-75-4 T13	25	25	150	4.0	13.0	75-100	System ADA 4.0	356010 0010	226,-	356011 0010	226,-	
									3138		3138	

## ATORN® Recess clamp mounting GROOVE Modular

NEW



### Clamp mounting AMM Modular R/L

#### • for modules AMR.. / AMAE..

- Supplied with chuck key and assembly screws

ISO designation	Shank height mm	Shank width mm	Angle °	suitable cutting edge holder	Right-hand		Left-hand	
					art.no.	€	art.no.	€
AMM-R/L 2020-00°	20	20	0	AM...R/L-20	<b>356020</b> 2000	216,-	<b>356021</b> 2000	216,-
AMM-R/L 2020-45°	20	20	45	AM...R/L-20	356020 2045	216,-	356021 2045	216,-
AMM-R/L 2020-90°	20	20	90	AM...R/L-20	356020 2090	216,-	356021 2090	216,-
AMM-R/L 2525-00°	25	25	0	AM...R/L-25	356020 2500	221,-	356021 2500	221,-
AMM-R/L 2525-45°	25	25	45	AM...R/L-25	356020 2545	221,-	356021 2545	221,-
AMM-R/L 2525-90°	25	25	90	AM...R/L-25	356020 2590	221,-	356021 2590	221,-
					3138		3138	

## ATORN® Cutting edge holder GROOVE Modular

NEW

- Supplied without chuck key

### Cutting edge holder AMR Modular Radial R/L

#### • For recessing inserts system AD / AE

- For parting-off and deep grooving

#### • Note for recessing module AMR

- A left-hand recessing module is required for a right-hand clamp mounting version 0°
- A right-hand recessing module is required for a left-hand clamp mounting version 0°



ISO designation	W mm	max. depth mm	suitable cutting inserts	suitable tool holder	Right-hand		Left-hand	
					art.no.	€	art.no.	€
AMR-R/L 20 ADE02 T25	2.0	25	System AD/AE 2.0	AMM-R/L 2020	<b>356024</b> 2002	119,-	<b>356025</b> 2002	119,-
AMR-R/L 20 ADE03 T25	3.0	25	System AD/AE 3.0	AMM-R/L 2020	356024 2003	119,-	356025 2003	119,-
AMR-R/L 20 ADE04 T25	4.0	25	System AD/AE 4.0	AMM-R/L 2020	356024 2004	119,-	356025 2004	119,-
AMR-R/L 25 ADE02 T25	2.0	25	System AD/AE 2.0	AMM-R/L 2525	356024 2502	120,50	356025 2502	120,50
AMR-R/L 25 ADE03 T25	3.0	25	System AD/AE 3.0	AMM-R/L 2525	356024 2503	120,50	356025 2503	120,50
AMR-R/L 25 ADE04 T25	4.0	25	System AD/AE 4.0	AMM-R/L 2525	356024 2504	120,50	356025 2504	120,50
					3138		3138	

### Cutting edge holder AMAE Modular Axial R/L

#### • For recessing inserts system ADA

- for axial grooving, Ø 40 - 200 mm

#### • Note for recessing module AMAE

- A left-hand recessing module is required for a right-hand clamp mounting version 45° and 90°
- A right-hand recessing module is required for a left-hand clamp mounting version 45° and 90°



ISO designation	W mm	max. depth mm	D mm	suitable cutting inserts	suitable tool holder	Right-hand		Left-hand	
						art.no.	€	art.no.	€
AMAE-R/L 25 ADA03 T15 40-50	3.0	15	40-50	System ADA 3.0	AMM-R/L 2525	<b>356026</b> 0001	141,-	<b>356027</b> 0001	141,-
AMAE-R/L 25 ADA03 T15 50-60	3.0	15	50-60	System ADA 3.0	AMM-R/L 2525	356026 0002	141,-	356027 0002	141,-
AMAE-R/L 25 ADA03 T15 60-75	3.0	15	60-75	System ADA 3.0	AMM-R/L 2525	356026 0003	141,-	356027 0003	141,-
AMAE-R/L 25 ADA03 T15 75-100	3.0	15	75-100	System ADA 3.0	AMM-R/L 2525	356026 0004	141,-	356027 0004	141,-
AMAE-R/L 25 ADA03 T15 100-140	3.0	15	100-140	System ADA 3.0	AMM-R/L 2525	356026 0005	141,-	356027 0005	141,-
AMAE-R/L 25 ADA03 T15 140-200	3.0	15	140-200	System ADA 3.0	AMM-R/L 2525	356026 0006	141,-	356027 0006	141,-
AMAE-R/L 25 ADA04 T15 100-140	4.0	15	100-140	System ADA 4.0	AMM-R/L 2525	356026 0011	141,-	356027 0011	141,-
AMAE-R/L 25 ADA04 T15 140-200	4.0	15	140-200	System ADA 4.0	AMM-R/L 2525	356026 0012	141,-	356027 0012	141,-
AMAE-R/L 25 ADA04 T15 40-50	4.0	15	40-50	System ADA 4.0	AMM-R/L 2525	356026 0007	141,-	356027 0007	141,-
AMAE-R/L 25 ADA04 T15 50-60	4.0	15	50-60	System ADA 4.0	AMM-R/L 2525	356026 0008	141,-	356027 0008	141,-
AMAE-R/L 25 ADA04 T15 60-75	4.0	15	60-75	System ADA 4.0	AMM-R/L 2525	356026 0009	141,-	356027 0009	141,-
AMAE-R/L 25 ADA04 T15 75-100	4.0	15	75-100	System ADA 4.0	AMM-R/L 2525	356026 0010	141,-	356027 0010	141,-
						3138		3138	

## ATORN® Recessing inserts ASS GROOVE

- The feed rates must be adjusted to the respective cutting edge width
- Cutting edge accuracy  $W \pm 0.02$  mm

### Chip breaker M - medium

- For grooving
- Negative protective chamfer
- First choice for steels with high tensile strength
- Appropriate for steel and grey cast iron
- Appropriate for grooving, parting-off and longitudinal turning operations

ISO designation	Width mm	r mm	max. depth mm						Quality	art.no.	€	
				ISO P	ISO M	ISO K	ISO N	ISO S				ISO H
ASS 2.00-0.2 M	2.00	0.2	8	●		●				ACP 20 G	10 389000 2020	13,75
	2.00	0.2	8	●		●				APU 40 G	10 389000 2040	13,75
	2.00	0.2	8	●	●					APM 45 G	10 389000 2045	13,75
ASS 3.00-0.2 M	3.00	0.2	8	●		●				ACP 20 G	10 389000 3120	13,85
	3.00	0.2	8	●		●				APU 40 G	10 389000 3140	13,85
	3.00	0.2	8	●	●					APM 45 G	10 389000 3145	13,85
ASS 4.00-0.3 M	4.00	0.3	8	●		●				ACP 20 G	10 389000 4220	16,-
	4.00	0.3	8	●		●				APU 40 G	10 389000 4240	16,-
	4.00	0.3	8	●	●					APM 45 G	10 389000 4245	16,-
ASS 5.00-0.3 M	5.00	0.3	8	●		●				ACP 20 G	10 389000 5120	18,45
	5.00	0.3	8	●		●				APU 40 G	10 389000 5140	18,45
	5.00	0.3	8	●	●					APM 45 G	10 389000 5145	18,45
ASS 6.00-0.4 M	6.00	0.4	8	●		●				ACP 20 G	10 389000 6120	21,30
	6.00	0.4	8	●		●				APU 40 G	10 389000 6140	21,30
	6.00	0.4	8	●	●					APM 45 G	10 389000 6145	21,30

3145

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 70 - 200	Vc = 60 - 150	Vc = 70 - 200
ISO M stainless steel		Vc = 60 - 180	
ISO K cast iron	Vc = 80 - 180		Vc = 80 - 180
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.15	f = 0.1 - 0.25	f = 0.05 - 0.35

### Chip breaker, MU - medium, universal

- Parting-off and grooving
- Engraving and recess turning operations
- Outstanding chip control
- Suitable for steel and cast steel

ISO designation	Width mm	r mm	max. depth mm						Quality	art.no.	€	
				ISO P	ISO M	ISO K	ISO N	ISO S				ISO H
ASS 2.00-0.3 MU	2.00	0.2	8	●		●				ACP 20 G	10 389001 2020	13,75
	2.00	0.2	8	●		●				APU 40 G	10 389001 2040	13,75
	2.00	0.2	8	●	●					APM 45 G	10 389001 2045	13,75
ASS 3.00-0.3 MU	3.00	0.3	8	●		●				ACP 20 G	10 389001 3120	13,85
	3.00	0.3	8	●		●				APU 40 G	10 389001 3140	13,85
	3.00	0.3	8	●	●					APM 45 G	10 389001 3145	13,85
ASS 4.00-0.4 MU	4.00	0.4	8	●		●				ACP 20 G	10 389001 4220	16,-
	4.00	0.4	8	●		●				APU 40 G	10 389001 4240	16,-
	4.00	0.4	8	●	●					APM 45 G	10 389001 4245	16,-
ASS 5.00-0.4 MU	5.00	0.4	8	●		●				ACP 20 G	10 389001 5120	18,45
	5.00	0.4	8	●		●				APU 40 G	10 389001 5240	18,45
	5.00	0.4	8	●	●					APM 45 G	10 389001 5245	18,45
ASS 6.00-0.5 MU	6.00	0.5	8	●		●				ACP 20 G	10 389001 6120	21,30
	6.00	0.5	8	●		●				APU 40 G	10 389001 6140	21,30
	6.00	0.5	8	●	●					APM 45 G	10 389001 6145	21,30

3145

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 70 - 200	Vc = 60 - 150	Vc = 70 - 200
ISO M stainless steel		Vc = 60 - 180	
ISO K cast iron	Vc = 80 - 180		Vc = 80 - 180
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.35		f = 0.05 - 0.3

**Chip breaker ET - extra**

- For grooving
- Specially-designed for stainless-steel workpieces
- A solution for materials that are difficult to machine such as titanium or duplex
- extremely soft cutting

ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ASS 2.00-0.2 ET	2.00	0.2	8	●		●				ACP 20 G	10 389004 2020	13,75
	2.00	0.2	8	●	●					APU 40 G	10 389004 2040	13,75
	2.00	0.2	8	○	●			●		APM 45 G	10 389004 2045	13,75
ASS 3.00-0.3 ET	3.00	0.3	8	●		●				ACP 20 G	10 389004 3020	13,85
	3.00	0.3	8	●	●					APU 40 G	10 389004 3040	13,85
	3.00	0.3	8	○	●			●		APM 45 G	10 389004 3045	13,85
ASS 4.00-0.4 ET	4.00	0.4	8	●		●				ACP 20 G	10 389004 4020	18,85
	4.00	0.4	8	●	●					APU 40 G	10 389004 4040	18,85
	4.00	0.4	8	○	●			●		APM 45 G	10 389004 4045	18,85
ASS 5.00-0.4 ET	5.00	0.4	8	●		●				ACP 20 G	10 389004 5020	21,90
	5.00	0.4	8	●	●					APU 40 G	10 389004 5040	21,90
	5.00	0.4	8	○	●			●		APM 45 G	10 389004 5045	21,90
ASS 6.00-0.4 ET	6.00	0.4	8	●		●				ACP 20 G	10 389004 6020	25,30
	6.00	0.4	8	●	●					APU 40 G	10 389004 6040	25,30
	6.00	0.4	8	○	●			●		APM 45 G	10 389004 6045	25,30

3145

ISO	ACP 20 G	APM 45 G	APU 40 G
ISO P steel	Vc = 70 - 200	Vc = 60 - 150	Vc = 60 - 150
ISO M stainless steel		Vc = 60 - 180	Vc = 50 - 200
ISO K cast iron	Vc = 80 - 180		
ISO S superalloys		Vc = 15 - 120	
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.15	f = 0.07 - 0.18	f = 0.08 - 0.18

**Chip breaker MN - for machining aluminium**

- Parting-off and grooving
- Highly positive chip breaker with sharp cutting edge finish
- Highly polished chip breaker surface
- Maximum reduction of built-up edges

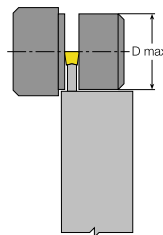
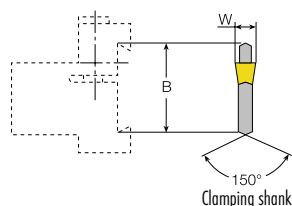
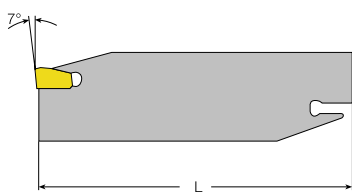
ISO designation	Width mm	r mm	max. depth mm	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
ASS 2.00-0.2 MN	2.00	0.2	8				●			AWN 16 G	10 389002 2016	17,-
ASS 3.00-0.3 MN	3.00	0.3	8				●			AWN 16 G	10 389002 3116	17,-
ASS 4.00-0.4 MN	4.00	0.4	8				●			AWN 16 G	10 389002 4216	18,85
ASS 5.00-0.4 MN	5.00	0.4	8				●			AWN 16 G	10 389002 5216	21,90
ASS 6.00-0.4 MN	6.00	0.4	8				●			AWN 16 G	10 389002 6216	25,30

3145

ISO	AWN 16 G
ISO N Al/ non-ferrous	Vc = 200 - 2000
Vc = [m/min] f = [mm/U]	f = 0.05 - 0.25

## ATORN® Recessing blades GROOVE

- for recessing inserts System ASS
- for parting-off and deep grooving
- Supplied without chuck key



### Recessing blade ABE right-hand / left-hand

ISO designation	B mm	L mm	W mm	suitable cutting inserts	D max. mm	suitable wrench	Right-hand		Left-hand	
							art.no.	€	art.no.	€
ABE R/L 26-ASS02	26	150	2.0	System ASS 2.0	50	3565000030	<b>356810</b> 2602	<b>83,40</b>	<b>356820</b> 2602	<b>83,40</b>
ABE R/L 32-ASS02	32	150	2.0	System ASS 2.0	50	3565000030	356810 3202	<b>83,40</b>	356820 3202	<b>83,40</b>
							3138		3138	



### Recessing blade ABE neutral

ISO designation	B mm	L mm	W mm	suitable cutting inserts	D max. mm	suitable wrench		
							art.no.	€
ABE N 26-ASS03	26	150	3.0	System ASS 3.0	70	3565000030	<b>356800</b> 2603	<b>103,-</b>
ABE N 26-ASS04	26	150	4.0	System ASS 4.0	80	3565000040	356800 2604	<b>90,60</b>
ABE N 32-ASS03	32	150	3.0	System ASS 3.0	100	3565000030	356800 3203	<b>83,40</b>
ABE N 32-ASS04	32	150	4.0	System ASS 4.0	100	3565000040	356800 3204	<b>91,10</b>
ABE N 32-ASS05	32	150	5.0	System ASS 5.0	110	3565000040	356800 3205	<b>106,-</b>
ABE N 32-ASS06	32	150	6.0	System ASS 6.0	110	3565000040	356800 3206	<b>106,-</b>
							3138	



### Recessing blade ABE right-hand / left-hand with internal cooling

ISO designation	B mm	L mm	W mm	suitable cutting inserts	D max. mm	suitable wrench	Right-hand		Left-hand	
							art.no.	€	art.no.	€
ABE R/L 26-ASS02	26	150	2.0	System ASS 2.0	50	3565000030	<b>356811</b> 2602	<b>149,-</b>	<b>356821</b> 2602	<b>149,-</b>
ABE R/L 32-ASS02	32	150	2.0	System ASS 2.0	50	3565000030	356811 3202	<b>154,50</b>	356821 3202	<b>154,50</b>
							3138		3138	



### Recessing blade ABE neutral with internal cooling

ISO designation	B mm	L mm	W mm	suitable cutting inserts	D max. mm	suitable wrench		
							art.no.	€
ABE N 26-ASS03-C	26	150	3.0	System ASS 3.0	70	3565000030	<b>356801</b> 2603	<b>149,-</b>
ABE N 26-ASS04-C	26	150	4.0	System ASS 4.0	80	3565000040	356801 2604	<b>149,-</b>
ABE N 32-ASS03-C	32	150	3.0	System ASS 3.0	100	3565000030	356801 3203	<b>154,50</b>
ABE N 32-ASS04-C	32	150	4.0	System ASS 4.0	100	3568000040	356801 3204	<b>154,50</b>
							3138	

### Chuck key

ISO designation	Chuck key art.no.	€
Wrench blade 2-3 mm system ASS/ABE/AD/AE	<b>356500</b> 0030	<b>40,70</b>
Wrench blade 4-6 mm system ASS/ABE/AD/AE	356500 0040	<b>40,70</b>

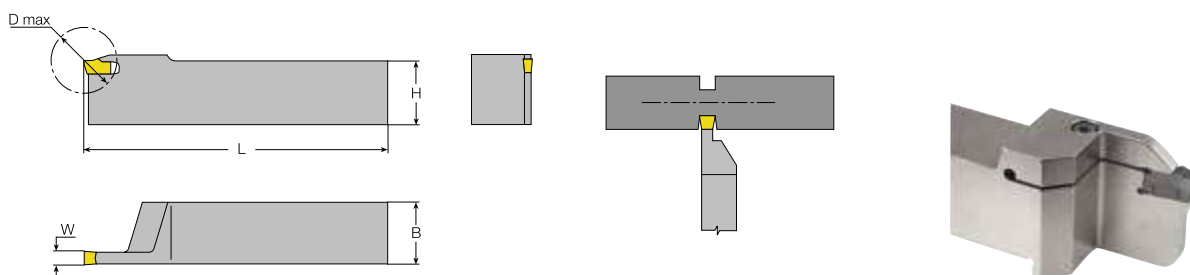
3106





## ATORN® Recess clamp mounting GROOVE

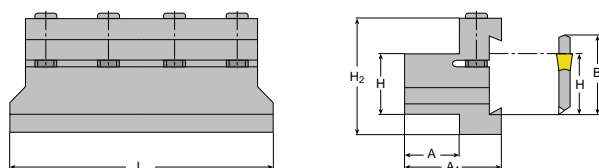
- for recessing inserts System ASS
- for longitudinal turning and grooving
- Supplied with chuck key



### Clamp mounting AME right-hand / left-hand

ISO designation	H mm	B mm	L mm	W mm	D max. mm	suitable cutting inserts	Tightening torque max. N-m	Right-hand art.no.	Right-hand €	Left-hand art.no.	Left-hand €
AME R/L 16-ASS03	16	16	150	3.0	40	System ASS 3.0	4.0	<b>356801 0001</b>	<b>109,-</b>	<b>356802 0001</b>	<b>109,-</b>
AME R/L 20-ASS03	20	20	150	3.0	40	System ASS 3.0	4.0	356801 0002	112,-	356802 0002	112,-
AME R/L 25-ASS03	25	25	150	3.0	40	System ASS 3.0	4.8	356801 0003	117,-	356802 0003	117,-
AME R/L 25-ASS05	25	25	150	5.0	50	System ASS 5.0	4.8	356801 0005	124,50	356802 0005	124,50
AME R/L 25-ASS06	25	25	150	6.0	64	System ASS 6.0	4.8	356801 0006	132,50	356802 0006	132,50
								3138		3138	

## ATORN® Recessing blade mount AD / AE / ASS GROOVE



### Recessing blade holder AEB

- For recessing blade ABE ASS without internal cooling
- For recessing blade ABE AD without internal cooling

ISO designation	H mm	A mm	B mm	L mm	A1 mm	H2 mm	suitable cutting edge holder	art.no.	€
AEB26-2020	20	20	26	90	37	43	Dimension B = 26	<b>356101 2620</b>	<b>186,50</b>
AEB32-2525	25	20	32	110	38	49	Dimension B = 32	356101 3225	203,-
								3138	



### Recessing blade holder AEB with internal cooling

- For recessing blade ABE AD with internal cooling

ISO designation	H mm	A mm	B mm	L mm	A1 mm	H2 mm	suitable cutting edge holder	art.no.	€
AEB26-2020 IK	20	20	26	82	40	43	Dimension B = 26	<b>356100 2620</b>	<b>339,-</b>
AEB32-2525 IK	25	25	32	95	44.5	49	Dimension B = 32	356100 3225	344,-
								3138	



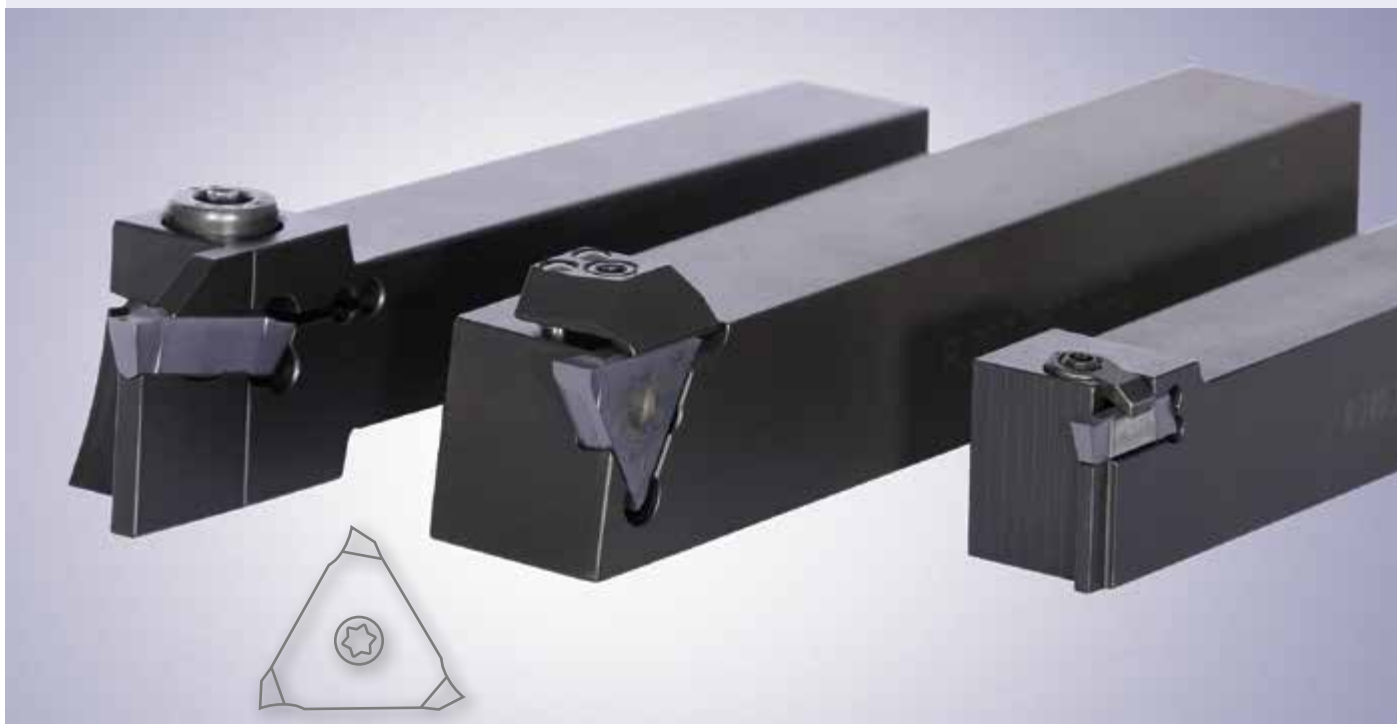
Grooving from 2 mm ...

... with internal cooling.

**ATORN®**  
Performance demands quality

**ATORN® DED grooving system****INFO**

Recess turning tools with three-fluted indexable inserts

**ATORN® DED**

- 3-cutting-edge system
- Quick, positionally accurate changing of blades
- For punching depths up to 6 mm depth and 8 mm width
- For grooving and parting-off, for grooves in accordance with DIN 471/472, for axial grooves
- More cost-effective with 3 cutting edges
- Soft cutting with modern coatings and ground chip breakers

**ATORN® DED grooving system holder**

- For three-edged recessing inserts
- Solid tool holder made from 42 CrMo4V, approx. 1,300 N/mm<sup>2</sup> Hardened and tempered
- Powerful clamping element guided by two cylindrical pins

**Holder type R/L.. 1-D**

- Punching depth up to 4 mm
- T<sub>max.</sub> reduced for workpiece Ø > 40 mm

Designation	H ± 0.1 mm	B ± 0.1 mm	L1 mm	L2 mm	T max. mm	suitable cutting inserts					Right-hand		Left	
							A1	B1	C1	D1	art.no.	€	art.no.	€
R 207,1212,1-D	12	12	100	24	4	DED.00.. DED.01..	A1	B1		D1	350001 1212	107,-		
L 207,1616,1-D	16	16	125	22	4	DED.00.. DED.01..		B1	C1	D1			350005 1616	95,10
R 207,1616,1-D	16	16	125	22	4	DED.00.. DED.01..	A1	B1		D1	350001 1616	95,10		
L 207,2020,1-D	20	20	125	21	4	DED.00.. DED.01..		B1	C1	D1			350005 2020	73,80
R 207,2020,1-D	20	20	125	21	4	DED.00.. DED.01..	A1	B1		D1	350001 2020	73,80		
L 207,2525,1-D	25	25	150	-	4	DED.00.. DED.01..		B1	C1	D1			350005 2525	77,90
R 207,2525,1-D	25	25	150	-	4	DED.00.. DED.01..	A1	B1		D1	350001 2525	77,90		

3131

3131

**11 pcs set**

**• DED grooving system**

• Holder with set of 10 indexable inserts

• **Tmax. reduced for workpiece Ø > 40 mm**

Contents	art.no.	€
1 x clamp mounting R.207.2020.1-D 20 x 20 mm, punching depth up to 4 mm (for DED.00../DED.01..)		
1 of each recessing insert DIN 471/472:		
DED.0050.00-D 0.5 mm		
DED.0060.00-D 0.6 mm		
DED.0070.00-D 0.7 mm		
DED.0080.00-D 0.8 mm		
DED.0090.00-D 0.9 mm		
DED.0100.00-D 1.0 mm		
DED.0110.00-D 1.1 mm		
DED.0130.00-D 1.3 mm		
DED.0160.00-D 1.6 mm		
DED.0185.00-D 1.85 mm		
	<b>350600 0011</b>	<b>244,-</b>

3131



**Holder type R/L..2-D**

• Punching depth up to 6 mm

• **Tmax. reduced for workpiece Ø > 40 mm**

Designation	H ± 0.1 mm	B ± 0.1 mm	L1 mm	L2 mm	T max. mm	suitable cutting inserts					Right-hand art.no.	€	Left-hand art.no.	€
L 207,1616,2-D	16	16	125	22	6	DED.02..		B1	C1	D1			<b>350006</b> 1616	<b>95,10</b>
R 207,1616,2-D	16	16	125	22	6	DED.02..	A1	B1		D1	<b>350002</b> 1616	<b>95,10</b>		
L 207,2020,2-D	20	20	125	21	6	DED.02..		B1	C1	D1			350006 2020	<b>73,80</b>
R 207,2020,2-D	20	20	125	21	6	DED.02..	A1	B1		D1	350002 2020	<b>73,80</b>		
L 207,2525,2-D	25	25	150	-	6	DED.02..		B1	C1	D1			350006 2525	<b>77,90</b>
R 207,2525,2-D	25	25	150	-	6	DED.02..	A1	B1		D1	350002 2525	<b>77,90</b>		
											3131		3131	

**Holder type R/L..3-D**

• Punching depth up to 6 mm

• **Tmax. reduced for workpiece Ø > 40 mm**

Designation	H ± 0.1 mm	B ± 0.1 mm	L1 mm	L2 mm	T max. mm	suitable cutting inserts					Right-hand art.no.	€	Left-hand art.no.	€
L 207,1616,3-D	16	16	125	22	6	DED.03..		B1	C1	D1			<b>350007</b> 1616	<b>95,10</b>
R 207,1616,3-D	16	16	125	22	6	DED.03..	A1	B1		D1	<b>350003</b> 1616	<b>95,10</b>		
L 207,2020,3-D	20	20	125	21	6	DED.03..		B1	C1	D1			350007 2020	<b>73,80</b>
R 207,2020,3-D	20	20	125	21	6	DED.03..	A1	B1		D1	350003 2020	<b>73,80</b>		
L 207,2525,3-D	25	25	150	-	6	DED.03..		B1	C1	D1			350007 2525	<b>77,90</b>
R 207,2525,3-D	25	25	150	-	6	DED.03..	A1	B1		D1	350003 2525	<b>77,90</b>		
											3131		3131	

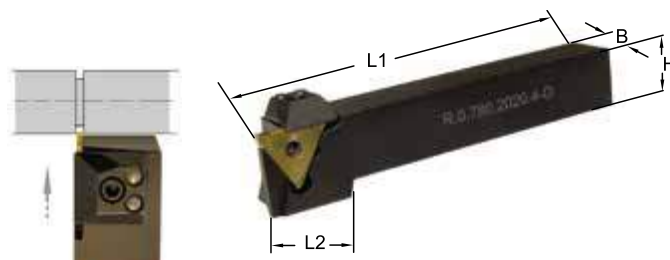
**Holder type R/L..4-D**

• Punching depth up to 6 mm

• **Tmax. reduced for workpiece Ø > 40 mm**

Designation	H ± 0.1 mm	B ± 0.1 mm	L1 mm	L2 mm	T max. mm	suitable cutting inserts					Right-hand art.no.	€	Left-hand art.no.	€
L 207,1616,4-D	16	16	125	21	6	DED.04.. DED.05..		B1	C2	D1			<b>350008</b> 1616	<b>95,10</b>
R 207,1616,4-D	16	16	125	21	6	DED.04.. DED.05..	A2	B1		D1	<b>350004</b> 1616	<b>95,10</b>		
L 207,2020,4-D	20	20	125	-	6	DED.04.. DED.05..		B1	C2	D1			350008 2020	<b>73,80</b>
R 207,2020,4-D	20	20	125	-	6	DED.04.. DED.05..	A2	B1		D1	350004 2020	<b>73,80</b>		
L 207,2525,4-D	25	25	150	-	6	DED.04.. DED.05..		B1	C2	D1			350008 2525	<b>77,90</b>
R 207,2525,4-D	25	25	150	-	6	DED.04.. DED.05..	A2	B1		D1	350004 2525	<b>77,90</b>		
											3131		3131	

Continued on next page >>>

**Holder type R/L..2-D**

- Punching depth up to 8 mm

- **Tmax. reduced for workpiece Ø > 125 mm**

Designation	H ± 0.1 mm	B ± 0.1 mm	L1 mm	L2 mm	T max. mm	suitable cutting inserts					Right-hand art.no.	€	Left-hand art.no.	€
L 0,780.2020,2D	20	20	125	24	8	DED.02..		B1	C1	D1			<b>350012</b> 2020	<b>78,90</b>
R 0,780.2020,2D	20	20	125	24	8	DED.02..	A1	B1		D1	<b>350009</b> 2020	<b>78,90</b>		
L 0,780.2525,2D	25	25	150	-	8	DED.02..		B1	C1	D1			350012 2525	<b>82,90</b>
R 0,780.2525,2D	25	25	150	-	8	DED.02..	A1	B1		D1	350009 2525	<b>82,90</b>		
L 0,780.3232,2D	32	32	170	-	8	DED.02..		B1	C1	D1			350012 3232	<b>99,20</b>
R 0,780.3232,2D	32	32	170	-	8	DED.02..	A1	B1		D1	350009 3232	<b>99,20</b>		

3131

3131

**Holder type R/L..3-D**

- Punching depth up to 8 mm

- **Tmax. reduced for workpiece Ø > 125 mm**

Designation	H ± 0.1 mm	B ± 0.1 mm	L1 mm	L2 mm	T max. mm	suitable cutting inserts					Right-hand art.no.	€	Left-hand art.no.	€
L 0,780.2020,3D	20	20	125	24	8	DED.03..		B1	C1	D1			<b>350013</b> 2020	<b>78,90</b>
R 0,780.2020,3D	20	20	125	24	8	DED.03..	A1	B1		D1	<b>350010</b> 2020	<b>78,90</b>		
L 0,780.2525,3D	25	25	150	-	8	DED.03..		B1	C1	D1			350013 2525	<b>82,90</b>
R 0,780.2525,3D	25	25	150	-	8	DED.03..	A1	B1		D1	350010 2525	<b>82,90</b>		
L 0,780.3232,3D	32	32	170	-	8	DED.03..		B1	C1	D1			350013 3232	<b>99,20</b>
R 0,780.3232,3D	32	32	170	-	8	DED.03..	A1	B1		D1	350010 3232	<b>99,20</b>		

3131

3131

**Holder type R/L..4-D**

- Punching depth up to 8 mm

- **Tmax. reduced for workpiece Ø > 125 mm**

Designation	H ± 0.1 mm	B ± 0.1 mm	L1 mm	L2 mm	T max. mm	suitable cutting inserts					Right-hand art.no.	€	Left-hand art.no.	€
L 0,780.2020,4D	20	20	125	24	8	DED.04.. DED.05..		B1	C2	D1			<b>350014</b> 2020	<b>78,90</b>
R 0,780.2020,4D	20	20	125	24	8	DED.04.. DED.05..	A2	B1		D1	<b>350011</b> 2020	<b>78,90</b>		
L 0,780.2525,4D	25	25	150	-	8	DED.04.. DED.05..		B1	C2	D1			350014 2525	<b>82,90</b>
R 0,780.2525,4D	25	25	150	-	8	DED.04.. DED.05..	A2	B1		D1	350011 2525	<b>82,90</b>		
L 0,780.3232,4D	32	32	170	-	8	DED.04.. DED.05..		B1	C2	D1			350014 3232	<b>99,20</b>
R 0,780.3232,4D	32	32	170	-	8	DED.04.. DED.05..	A2	B1		D1	350011 3232	<b>99,20</b>		

3131

3131

**Spare parts**

	Clamping claw art.no.	€		Clamping screw art.no.	€		Clamping claw art.no.	€		Guide pin art.no.	€
A1	370001 0121	<b>21,40</b>	B1	370001 0200	<b>4,33</b>	C1	370001 0221	<b>21,40</b>	D1	370001 6325	<b>0,46</b>
A2	370001 0125	<b>23,70</b>				C2	370001 0225	<b>23,70</b>			
	3131			3131			3131			3131	



Non-rebound ...

... it's the tool.

**ATORN®**  
 Performance demands quality

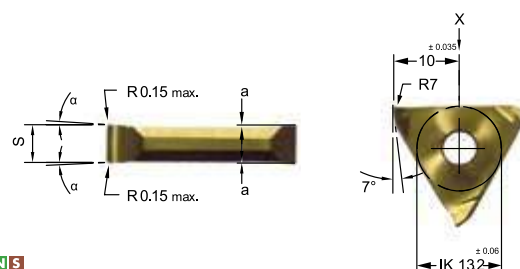
## ATORN® DED grooving system inserts



1088

### • 3 cutting edges

- Sintered version with incircle Ø 13.2 mm
- Positive, ground cutting geometries
- Extremely easy cutting action
- Low cutting forces
- Parting-off insert with chip breaker
- High thermal and chemical stability
- Low friction coefficient
- Can be used under some circumstances for dry machining
- Can be used universally with almost all materials
- Versions for parting-off, grooving, radius recessing, copy turning and precision turning
- **Material: HC 8620 ISO PMKNS fine grain carbide, TiAlN-coated**



### For retaining grooves in accordance with DIN 471 / 472

ISO P M K N S

Designation	Groove width mm	S-0.05 mm	Clearance angle $\alpha$ below	Clearance angle $\alpha$ above	$a \pm 0.02$ mm	suitable tool holder	art.no.	€
DED.0050,00-D	0.5	0.57	0.5°	1°	0.06	R/L.1-D	360001 0050	16,50
DED.0060,00-D	0.6	0.67	0.5°	1°	0.07	R/L.1-D	360001 0060	16,50
DED.0070,00-D	0.7	0.77	0.5°	1°	0.08	R/L.1-D	360001 0070	16,50
DED.0080,00-D	0.8	0.87	0.5°	1°	0.08	R/L.1-D	360001 0080	16,50
DED.0090,00-D	0.9	0.97	0.5°	1°	0.08	R/L.1-D	360001 0090	16,50
DED.0100,00-D	1.0	1.07	0.5°	1°	0.09	R/L.1-D	360001 0100	16,50
DED.0110,00-D	1.1	1.24	3°	3°	0.15	R/L.1-D	360001 0110	16,50
DED.0130,00-D	1.3	1.44	3°	3°	0.15	R/L.1-D	360001 0130	16,50
DED.0160,00-D	1.6	1.74	3°	3°	0.20	R/L.1-D	360001 0160	16,50
DED.0185,00-D	1.85	1.99	3°	3°	0.20	R/L.1-D	360001 0185	16,50
DED.0215,00-D	2.15	2.29	3°	3°	0.20	R/L.2-D	360001 0215	16,50
DED.0265,00-D	2.65	2.79	3°	3°	0.20	R/L.2-D	360001 0265	16,50
DED.0315,00-D	3.15	3.29	3°	3°	0.20	R/L.3-D	360001 0315	17,80
DED.0415,00-D	4.15	4.29	3°	3°	0.20	R/L.4-D	360001 0415	18,05
DED.0515,00-D	5.15	5.29	3°	3°	0.20	R/L.4-D	360001 0515	18,65

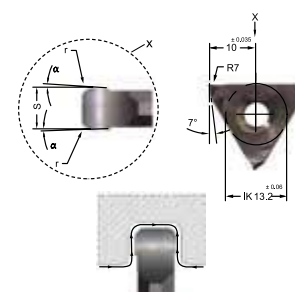
3131

### For copy and precision turning

ISO P M K N S

Designation	S-0.05 mm	r mm	Clearance angle $\alpha$ below	Clearance angle $\alpha$ above	suitable tool holder	art.no.	€
DED.0150,02-D	1.5	0.2	4°	3°	R/L.1-D	360002 0150	20,60
DED.0200,02-D	2.0	0.2	4°	3°	R/L.1-D	360002 0202	20,60
DED.0200,04-D	2.0	0.4	4°	3°	R/L.1-D	360002 0204	21,20
DED.0300,02-D	3.0	0.2	4°	3°	R/L.2-D	360002 0302	21,20
DED.0300,06-D	3.0	0.6	4°	3°	R/L.2-D	360002 0306	21,70
DED.0300,08-D	3.0	0.8	4°	3°	R/L.2-D	360002 0308	21,70
DED.0400,02-D	4.0	0.2	4°	3°	R/L.3-D	360002 0402	21,80
DED.0400,08-D	4.0	0.8	4°	3°	R/L.3-D	360002 0408	21,80
DED.0400,12-D	4.0	1.2	4°	3°	R/L.3-D	360002 0412	21,80

3131

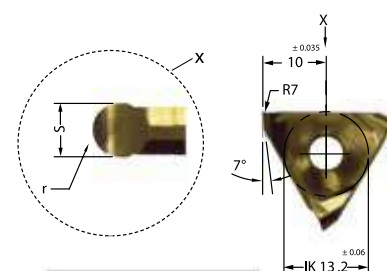


### Full radius for recess turning grooves with widths from 0.5 to 1.6 mm

ISO P M K N S

Designation	S-0.05 mm	r mm	a mm	suitable tool holder	art.no.	€
DED.0002,05-D	0.5	0.25	0.07	R/L.1-D	360004 0002	22,50
DED.0005,10-D	1.0	0.5	0.09	R/L.1-D	360004 0005	22,50
DED.0006,12-D	1.2	0.6	0.20	R/L.1-D	360004 0006	22,50
DED.0008,16-D	1.6	0.8	0.25	R/L.1-D	360004 0008	22,50

3131




### Full radius for recess turning grooves with widths from 2.0 to 5.0 mm

ISO P M K N S

Designation	S-0.05 mm	r mm	suitable tool holder	art.no.	€
DED.0010,20-D	2.0	1.0	R/L.2-D	360003 0010	25,40
DED.0012,25-D	2.5	1.25	R/L.2-D	360003 0012	26,10
DED.0015,30-D	3.0	1.5	R/L.3-D	360003 0015	26,80
DED.0020,40-D	4.0	2.0	R/L.4-D	360003 0020	26,80
DED.0025,50-D	5.0	2.5	R/L.4-D	360003 0025	27,10

3131





**palbit**  **Grooving and parting-off system MINI**

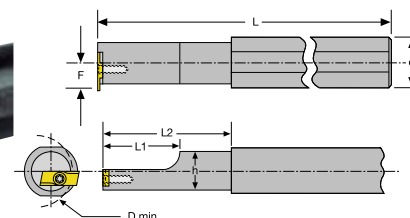
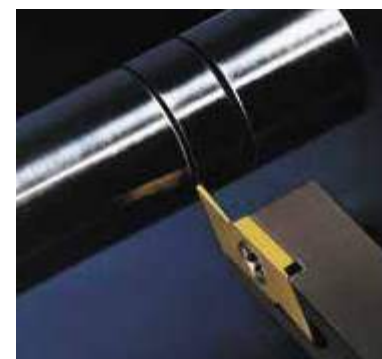
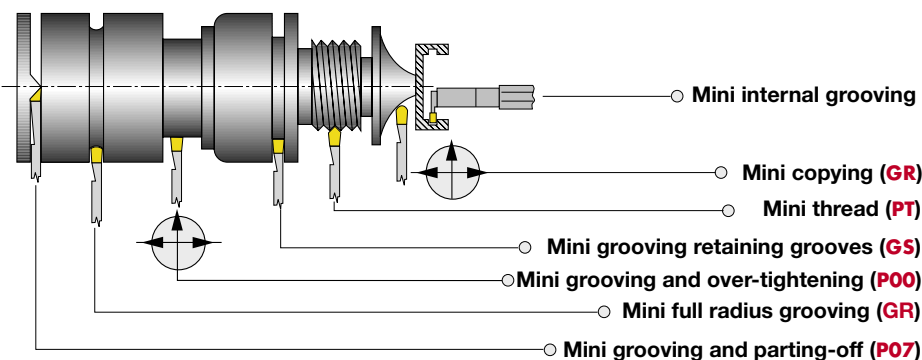
- Two cutting edges on each indexable cutting insert for extremely small-scale grooving and parting-off tasks
- Practically the entire spectrum of operations involved in grooving and parting-off work up to 2.0 mm is covered with a minimum of equipment.
- The design of the insert seat in the holder, clamped in place by means of a TORX screw, ensures a high level of repeatability and positioning precision of the cutting edge, and enables all of the indexable cutting inserts listed below to be used.

**Grooving and parting-off up to 2 mm**





**External machining**

Designation	B mm	H mm	L mm	S mm			Right-hand		Left-hand	
							art.no.	€	art.no.	€
SALHER/L 0808 M07	8	8	150	8	A1	C1	<b>361003 0808</b>	<b>83,40</b>	<b>361004 0808</b>	<b>83,40</b>
SALHER/L 1010 M07	10	10	150	10	A1	C1	361003 1010	83,40	361004 1010	83,40
SALHER/L 1212 M07	12	12	150	12	A1	C1	361003 1212	83,40	361004 1212	83,40
SALHER/L 1616 M07	16	16	150	16	A1	C1	361003 1616	91,10	361004 1616	91,10
SALHER/L 2020 M07	20	20	150	20	A1	C1	361003 2020	115,-	361004 2020	115,-
SALHER/L 2525 M07	25	25	150	25	A1	C1	361003 2525	126,50	361004 2525	126,50
							3158		3158	



**Internal machining**

- For internal machining, please select right-hand inserts and left-hand holders, or left-hand inserts and right-hand holders.

Designation	D mm	H mm	L mm	L1 mm	L2 mm	F mm	D min. mm			Right-hand		Left-hand	
										art.no.	€	art.no.	€
THI -7-20	20.0	19.05	140	25	50	13.34	25.0	A2	B1	<b>361015 0720</b>	<b>141,50</b>	<b>361016 0720</b>	<b>141,50</b>
THI -7-25	25.0	19.05	150	32	63	13.34	27.0	A2	B1	361015 0725	155,-	361016 0725	155,-
										3158		3158	

**Spare parts**

Screw			Steel grey			TORX		
	art.no.	€		art.no.	€		art.no.	€
A1	321099 0344	4,07	B1	703038 0080	2,09	C1	703053 0080	1,93
A2	361060 0001	3,81						
	3160			7111			7114	


## palbit Grooving and parting-off inserts MINI



• All illustrations show RH versions


### RN / LN neutral

- RN for right-hand external holder
- LN for left-hand external holder

ISO designation	W+0.02 mm	T mm		ISO <b>P K M S</b>		ISO <b>P K M S</b>	
				Right-hand PH 7920 art.no.	€	Left-hand PH 7920 art.no.	€
SAL11P100R/LN-P00	1.00	6.00	5	<b>361602</b> 1050	<b>28,80</b>	5	<b>361603</b> 1050 <b>28,80</b>
SAL11P150R/LN-P00	1.50	6.00	5	361602 1550	<b>28,80</b>	5	361603 1550 <b>28,80</b>
SAL11P200R/LN-P00	2.00	6.00	5	361602 2050	<b>28,80</b>	5	361603 2050 <b>28,80</b>
				3149			3149


### RR / RL 7°

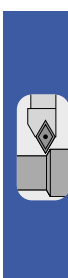
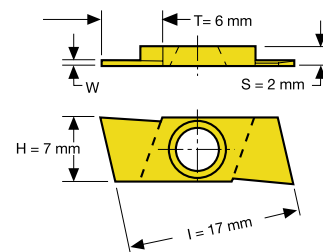
- RR for right-hand external holder
- RL for left-hand external holder

ISO designation	W+0.02 mm	T mm		ISO <b>P K M S</b>		ISO <b>P K M S</b>	
				Right-hand PH 7920 art.no.	€	Left-hand PH 7920 art.no.	€
SAL11P100RR/LP07	1.00	6.00	5	<b>361604</b> 1050	<b>28,80</b>	5	<b>361605</b> 1050 <b>28,80</b>
SAL11P150RR/LP07	1.50	6.00	5	361604 1550	<b>28,80</b>	5	361605 1550 <b>28,80</b>
SAL11P200RR/LP07	2.00	6.00	5	361604 2050	<b>28,80</b>	5	361605 2050 <b>28,80</b>
				3149			3149

### LR / LL 7°

- LR for right-hand external holder
- LL for left-hand external holder

ISO designation	W+0.02 mm	T mm		ISO <b>P K M S</b>		ISO <b>P K M S</b>	
				Right-hand PH 7920 art.no.	€	Left-hand PH 7920 art.no.	€
SAL11P100LR/LP07	1.00	6.00	5	<b>361614</b> 1050	<b>28,80</b>	5	<b>361615</b> 1050 <b>28,80</b>
SAL11P150LR/LP07	1.50	6.00	5	361614 1550	<b>28,80</b>	5	361615 1550 <b>28,80</b>
SAL11P200LR/LP07	2.00	6.00	5	361614 2050	<b>28,80</b>	5	361615 2050 <b>28,80</b>
				3149			3149




## palbit Radius grooving inserts MINI

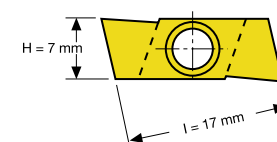
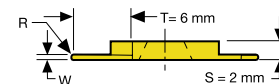


• All illustrations show RH versions

### R / L

- R for right-hand external holder
- L for left-hand external holder

ISO designation	W+0.02 mm	R mm		ISO <b>P K M S</b>		ISO <b>P K M S</b>	
				Right-hand PH 7920 art.no.	€	Left-hand PH 7920 art.no.	€
SAL60G100R/L-GR	1.0	0.5	5	<b>361600</b> 1050	<b>28,80</b>	5	<b>361601</b> 1050 <b>28,80</b>
SAL60G150R/L-GR	1.5	0.75	5	361600 1550	<b>28,80</b>	5	361601 1550 <b>28,80</b>
SAL60G200R/L-GR	2.0	1.0	5	361600 2050	<b>28,80</b>	5	361601 2050 <b>28,80</b>
				3149			3149






## palbit Grooving inserts for retaining grooves MINI

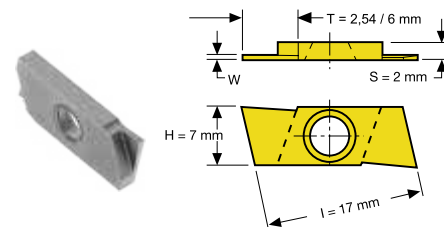


- All illustrations show RH versions

### R / L

- R for right-hand external holder
- L for left-hand external holder

ISO designation	W+0.02 mm	T mm		ISO <b>P K M S</b>		ISO <b>P K M S</b>		
				Right-hand PH 7920 art.no.	€	Left-hand PH 7920 art.no.	€	
SAL25G050R/LGS	0.50	2.50	5	361606 0550	28,80	5	361607 0550	28,80
SAL25G070R/LGS	0.70	2.50	5	361606 0750	28,80	5	361607 0750	28,80
SAL25G080R/LGS	0.80	2.50	5	361606 0850	28,80	5	361607 0850	28,80
SAL25G090R/LGS	0.90	2.50	5	361606 0950	28,80	5	361607 0950	28,80
SAL25G110R/LGS	1.10	6.00	5	361606 1050	28,80	5	361607 1050	28,80
SAL25G130R/LGS	1.30	6.00	5	361606 1350	28,80	5	361607 1350	28,80
SAL25G160R/LGS	1.60	6.00	5	361606 1650	28,80	5	361607 1650	28,80
SAL25G185R/LGS	1.85	6.00	5	361606 1850	28,80	5	361607 1850	28,80
				3149		3149		




## palbit Grooving inserts for thread MINI

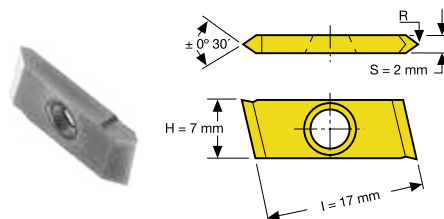


- All illustrations show RH versions

### R / L 60° / 55°

- R for right-hand external holder
- L for left-hand external holder

ISO designation	Angle °	R mm		ISO <b>P K M S</b>		ISO <b>P K M S</b>		
				Right-hand PH 7920 art.no.	€	Left-hand PH 7920 art.no.	€	
SAL100H012R/L55-PT	55	0.1	5	361608 5550	29,90	5	361609 5550	29,90
SAL100H012R/L60-PT	60	0.1	5	361608 6050	29,90	5	361609 6050	29,90
				3149		3149		

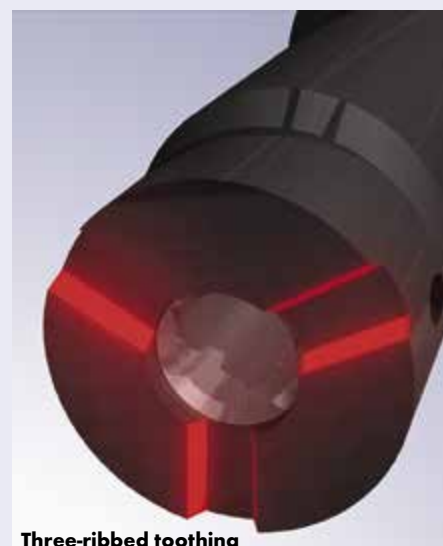


# THE COMPLETE MACHINING RANGE



**PALBIT**  
Machining tools  
411 pages  
Art.no. 019900 0315

Overview of all free manufacturers' catalogues  
on page 16/17

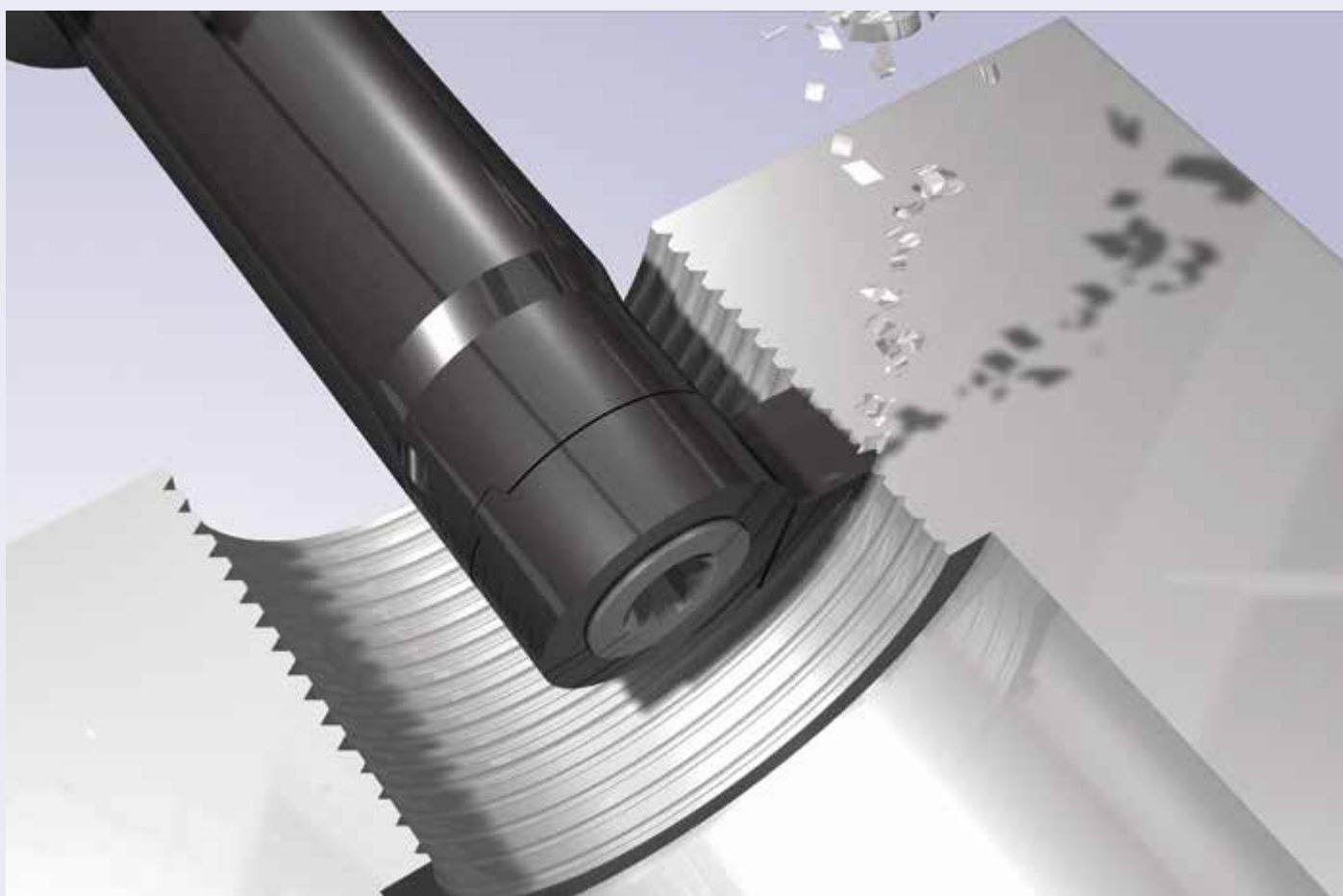


Three-ribbed tooting

## ATORN® MINI-CUT

The exchangeable carbide blades are screwed onto the front using the tried and tested three-ribbed tooting.

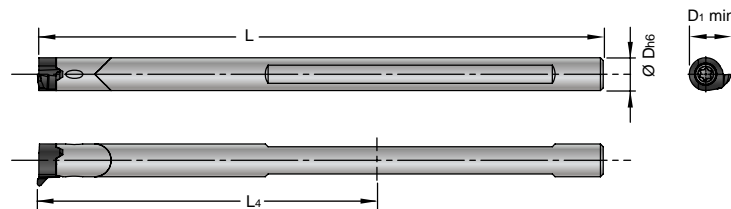
- Best repetition precision with easiest handling
- Best possible absorption of torque forces
- Very precise fixing of position of the blade at the centre of rotation



## ATORN® Tool holder MINI-CUT



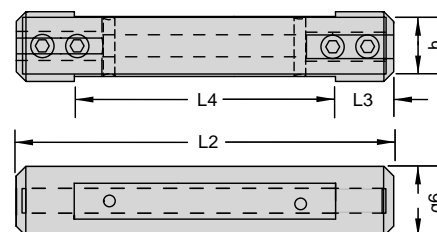
- **With internal cooling**
- For recess turning, internal turning and thread cutting (internal) from  $\varnothing 7.8$  mm
- Spare clamping screws available on request
- **FLE XO** clamp mounting, variable clamping range from ... to ... mm (see table Clamping length = „L4“)
- **FLE XO** clamp mounting for HM cutting inserts R/LS 08 and R/LS 11
- Suitable **FLE XO** steel clamp mounting



### FLE XO carbide tool holder

Designation	D h6 mm	D1 min. mm	L mm	L4 mm	suitable cutting inserts	art.no.	€
V08,0006,2HM	6.0	8.0	65.0	18-42	R/LS08	<b>305012 0081</b>	<b>231,-</b>
V08,0006,4HM	6.0	8.0	103.0	40-80	R/LS08	305012 0082	262,-
V11,0008,2HM	8.0	11.0	79.0	20-55	R/LS11	305012 0111	293,-
V11,0008,4HM	8.0	11.0	129.0	50-105	R/LS11	305012 0112	329,-

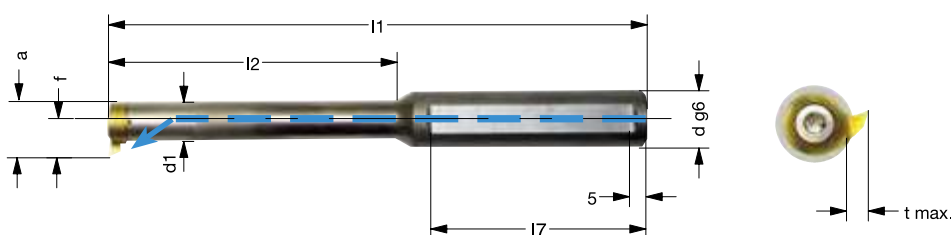
3127



### FLE XO steel tool holder

Designation	d g6 mm	L2 mm	L3 mm	L4 mm	h mm	art.no.	€
VG08-16	16	75	10	55	14	<b>305013 0081</b>	<b>117,-</b>
VG08-20	20	90	10	70	18	305013 0082	117,-
VG11-16	16	75	10	55	14	305013 0111	117,-
VG11-20	20	90	10	70	18	305013 0112	117,-

3127



### Carbide tool holder type 608...

Designation	d g6 mm	l2 mm	l1 mm	l7 mm	d1 mm	f mm	a mm	suitable cutting inserts	t max. mm	D min. mm	suitable clamping screw	art.no.	€	
608,0012,1 HM	12	21	80	48	6	4.8	7.8	R/LS08	1.0	8	M 2.6-MC	A1	<b>305001 0001</b>	<b>151,-</b>
608,0012,2 HM	12	30	90	48	6	4.8	7.8	R/LS08	1.0	8	M 2.6-MC	A1	305001 0002	164,-
608,0012,3 HM	12	42	100	48	6	4.8	7.8	R/LS08	1.0	8	M 2.6-MC	A1	305001 0003	191,50
608,0012,4 HM	12	50	115	48	6	4.8	7.8	R/LS08	1.0	8	M 2.6-MC	A1	305001 0004	221,-


3127

### Carbide clamp mounting 609...

Designation	d g6 mm	l2 mm	l1 mm	d1 mm	f mm	a mm	suitable cutting inserts	t max. mm	D min. mm	suitable clamping screw	art.no.	€	
609,0012,1HM	12	22	90	6.6 x 7.4	5.5	8.8	R/LS09	1.8	9.0	M2.6-MC	A1	<b>305005 0001</b>	<b>169,-</b>
609,0012,2HM	12	30	98	6.6 x 7.4	5.5	8.8	R/LS09	1.8	9.0	M2.6-MC	A1	305005 0002	195,50
609,0012,3HM	12	42	110	6.6 x 7.4	5.5	8.8	R/LS09	1.8	9.0	M2.6-MC	A1	305005 0003	221,-
609,0012,4HM	12	56	122	6.6 x 7.4	5.5	8.8	R/LS09	1.8	9.0	M2.6-MC	A1	305005 0004	247,-


3127

## Carbide tool holder type 611...

Designation	d g6 mm	l2 mm	l1 mm	l7 mm	d1 mm	f mm	a mm	suitable cutting inserts	t max. mm	D min. mm	suitable clamping screw		art.no.	€
611,0012,1 HM	12	29	95	60	8	6.7	10.7	R/LS11	2.3	11	M 3.5-MC	A2	<b>305002</b> 0001	151,-
611,0012,2 HM	12	42	110	60	8	6.7	10.7	R/LS11	2.3	11	M 3.5-MC	A2	305002 0002	164,-
611,0012,3 HM	12	56	120	60	8	6.7	10.7	R/LS11	2.3	11	M 3.5-MC	A2	305002 0003	191,50
611,0012,4 HM	12	64	130	60	8	6.7	10.7	R/LS11	2.3	11	M 3.5-MC	A2	305002 0004	221,-

3127

## Carbide tool holder type 614...

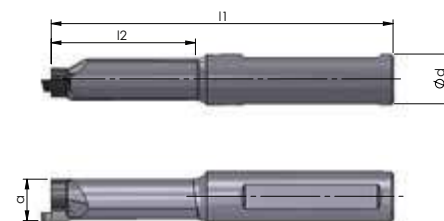
Designation	l7 mm	d g6 mm	l2 mm	l1 mm	d1 mm	f mm	a mm	suitable cutting inserts	t max. mm	D min. mm	suitable clamping screw		art.no.	€
614,0012,1 HM	60	12	34	100	9.5 x 11	9	13.8	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	<b>305003</b> 0001	178,-
614,0012,2 HM	60	12	45	110	9.5 x 11	9	13.8	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	305003 0002	206,-
614,0012,3 HM	60	12	64	130	9.5 x 11	9	13.8	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	305003 0003	239,-
614,0016,1 HM	60	16	34	100	9.5 x 11	9	13.8	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	305003 0004	216,-
614,0016,2 HM	60	16	45	110	9.5 x 11	9	13.8	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	305003 0005	247,-
614,0016,3 HM	60	16	64	130	9.5 x 11	9	13.8	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	305003 0006	285,-
614,0016,4 HM	60	16	75	145	9.5 x 11	9	13.8	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	305003 0007	306,-

3127

## Carbide tool holder type 616...


Designation	d g6 mm	l2 mm	l1 mm	l7 mm	d1 mm	f mm	a mm	suitable cutting inserts	t max. mm	D min. mm	suitable clamping screw		art.no.	€
616,0012,1 HM	12	40	130	60	11	10.2	15.7	R/LS16	4.3	16	M 5-MC	A4	<b>305004</b> 0001	194,50
616,0012,2 HM	12	56	130	60	11	10.2	15.7	R/LS16	4.3	16	M 5-MC	A4	305004 0002	206,-
616,0012,3 HM	12	80	150	60	11	10.2	15.7	R/LS16	4.3	16	M 5-MC	A4	305004 0003	242,-
616,0016,1 HM	16	40	130	60	11	10.2	15.7	R/LS16	4.3	16	M 5-MC	A4	305004 0004	236,-
616,0016,2 HM	16	56	130	60	11	10.2	15.7	R/LS16	4.3	16	M 5-MC	A4	305004 0005	247,-
616,0016,3 HM	16	80	150	60	11	10.2	15.7	R/LS16	4.3	16	M 5-MC	A4	305004 0006	285,-

3127



## Carbide axial clamp mounting 614...

- Right-hand holder - right-hand insert
- Left-hand holder - left-hand insert


Designation	d g6 mm	l2 mm	l1 mm	a mm	suitable cutting inserts	suitable clamping screw		Right-hand		Left-hand	
								art.no.	€	art.no.	€
R/L614.A016,3HM	16	60	120	13.5	R/L S014	M4-MC	A3	<b>305006</b> 0003	326,-	<b>305007</b> 0003	326,-

3127

3127

## Steel axial clamp mounting 614...

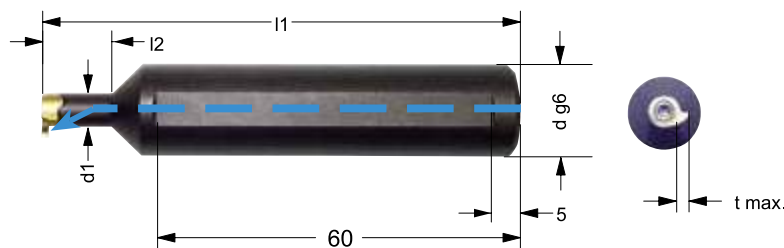
- Right-hand holder - right-hand insert
- Left-hand holder - left-hand insert


Designation	d g6 mm	l2 mm	l1 mm	a mm	suitable cutting inserts	suitable clamping screw		Right-hand		Left-hand	
								art.no.	€	art.no.	€
R/L614.A016,3ST	16	25	90	13.5	R/L S014	M4-MC	A3	<b>305006</b> 0001	114,-	<b>305007</b> 0001	114,-
R/L614.A016E.3ST	16	45	110	13.5	R/L S014	M4-MC	A3	305006 0002	121,50	305007 0002	121,50

3127

3127


Continued on next page &gt;&gt;&gt;

**Steel tool holder, short**

Designation	d g6 mm	l2 mm	l1 mm	d1 mm	suitable cutting inserts	t max. mm	D min. mm	suitable clamping screw		art.no.	€
608,0016,1 ST	16	12	80	6	R/LS08	1.0	8	M 2.6-MC	A1	<b>305010 0001</b>	<b>87,-</b>
609,0016,1.ST	16	14	95	6.6 x 7.4	R/LS09	1.8	9	M2.6-MC	A1	305010 0005	<b>87,-</b>
611,0016,2 ST	16	16	97	8	R/LS11	2.3	11	M 3.5-MC	A2	305010 0002	<b>87,-</b>
614,0016,3 ST	16	18	100	9.5 x 11	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	305010 0003	<b>99,70</b>
616,0016,3 ST	16	22	100	11	R/LS16	4.3	16	M 5-MC	A4	305010 0004	<b>87,-</b>

3127

**Steel tool holder, long**

Designation	d g6 mm	l2 mm	l1 mm	d1 mm	suitable cutting inserts	t max. mm	D min. mm	suitable clamping screw		art.no.	€
608,0016,1E.ST	16	22	90	6 x 7	R/LS08	1.0	8	M 2.6-MC	A1	<b>305011 0001</b>	<b>99,70</b>
609,0016,1E.ST	16	25	105	6.6 x 7.4	R/LS09	1.8	9	M2.6-MC	A1	305011 0005	<b>99,70</b>
611,0016,2E.ST	16	29	110	8 x 9.5	R/LS11	2.3	11	M 3.5-MC	A2	305011 0002	<b>99,70</b>
614,0016,3E.ST	16	38	120	9.5 x 11	R/LS14/55/65	4.0/6.5	14/17	M 4-MC	A3	305011 0003	<b>99,70</b>
616,0016,3E.ST	16	42	120	11 x 13.5	R/LS16	4.3	16	M 5-MC	A4	305011 0004	<b>99,70</b>

3127

**Spare parts**

		Screw	
art.no.	€		
A1 305199 0026	<b>3,46</b>		
A2 305199 0035	<b>3,46</b>		
A3 305199 0040	<b>3,46</b>		
A4 305199 0050	<b>3,46</b>		

3127

RIGHT ACROSS **EUROPE.**  
 WE MANAGE THAT FOR YOU  
**WITHIN 24 HOURS:**  
**24-HOUR DELIVERY**  
**THROUGHOUT EUROPE**

THAT'S POWER TO PRODUCE

**SARATOOLS.com**

**POWER TO PRODUCE**

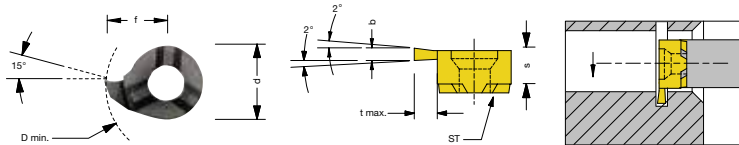
A BRAND OF SARTORIUS WERKZEUGE

**ATORN® Carbide indexable cutting inserts MINI-CUT**



**Recess turning (internal)**

- For circlip grooves
- Carbide HC8620, TiAlN-coated
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image



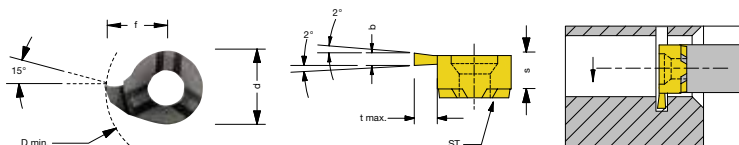
Model	D min. mm	f max. mm	b +0.03 mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
								art.no.	€	art.no.	€
R/LS008,0070	8	1.0	0.73	6.0	4.8	3.3	608	305020 0001	15,30	306020 0001	15,30
R/LS008,0080	8	1.0	0.83	6.0	4.8	3.3	608	305020 0002	15,30	306020 0002	15,30
R/LS008,0090	8	1.0	0.93	6.0	4.8	3.3	608	305020 0003	15,30	306020 0003	15,30
R/LS008,0110	8	1.0	1.20	6.0	4.8	3.3	608	305020 0004	15,30	306020 0004	15,30
R/LS008,0130	8	1.0	1.40	6.0	4.8	3.3	608	305020 0005	15,30	306020 0005	15,30
R/LS008,0160	8	1.0	1.70	6.0	4.8	3.3	608	305020 0006	15,30	306020 0006	15,30
R/LS009,0070	9	1.2	0.73	6.2	5.5	3.6	609	305020 0025	15,30	306020 0025	15,30
R/LS009,0080	9	1.3	0.83	6.2	5.5	3.6	609	305020 0026	15,30	306020 0026	15,30
R/LS009,0090	9	1.5	0.93	6.2	5.5	3.6	609	305020 0027	15,30	306020 0027	15,30
R/LS009,0110	9	1.8	1.20	6.2	5.5	3.6	609	305020 0028	15,30	306020 0028	15,30
R/LS009,0130	9	1.8	1.40	6.2	5.5	3.6	609	305020 0029	15,30	306020 0029	15,30
R/LS009,0160	9	1.8	1.70	6.2	5.5	3.6	609	305020 0030	15,30	306020 0030	15,30
R/LS011,0070	11	1.2	0.73	8.0	6.7	4.2	611	305020 0007	15,30	306020 0007	15,30
R/LS011,0080	11	1.3	0.83	8.0	6.7	4.2	611	305020 0008	15,30	306020 0008	15,30
R/LS011,0090	11	1.5	0.93	8.0	6.7	4.2	611	305020 0009	15,30	306020 0009	15,30
R/LS011,0110	11	2.3	1.20	8.0	6.7	4.2	611	305020 0010	15,30	306020 0010	15,30
R/LS011,0130	11	2.3	1.40	8.0	6.7	4.2	611	305020 0011	15,30	306020 0011	15,30
R/LS011,0160	11	2.3	1.70	8.0	6.7	4.2	611	305020 0012	15,30	306020 0012	15,30
R/LS014,0070	14	1.2	0.73	9.0	9.0	5.3	614	305020 0013	15,30	306020 0013	15,30
R/LS014,0080	14	1.3	0.83	9.0	9.0	5.3	614	305020 0014	15,30	306020 0014	15,30
R/LS014,0090	14	1.5	0.93	9.0	9.0	5.3	614	305020 0015	15,30	306020 0015	15,30
R/LS014,0110	14	4.0	1.20	9.0	9.0	5.3	614	305020 0016	15,30	306020 0016	15,30
R/LS014,0130	14	4.0	1.40	9.0	9.0	5.3	614	305020 0017	15,30	306020 0017	15,30
R/LS014,0160	14	4.0	1.70	9.0	9.0	5.3	614	305020 0018	15,30	306020 0018	15,30
R/LS016,0070	16	1.2	0.73	11.0	10.2	5.4	616	305020 0019	18,75	306020 0019	18,75
R/LS016,0080	16	1.3	0.83	11.0	10.2	5.4	616	305020 0020	18,75	306020 0020	18,75
R/LS016,0090	16	1.5	0.93	11.0	10.2	5.4	616	305020 0021	18,75	306020 0021	18,75
R/LS016,0110	16	4.3	1.20	11.0	10.2	5.4	616	305020 0022	16,90	306020 0022	16,90
R/LS016,0130	16	4.3	1.40	11.0	10.2	5.4	616	305020 0023	16,90	306020 0023	16,90
R/LS016,0160	16	4.3	1.70	11.0	10.2	5.4	616	305020 0024	16,90	306020 0024	16,90

3127

3127

**Recess turning (internal)**

- General recess turning
- Carbide HC8620, TiAlN-coated
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image



Model	D min. mm	f max. mm	b +0.03 mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
								art.no.	€	art.no.	€
R/LS008,0100	8	1.0	1.0	6.0	4.8	3.3	608	305021 0001	15,30	306021 0001	15,30
R/LS008,0150	8	1.0	1.5	6.0	4.8	3.3	608	305021 0002	15,30	306021 0002	15,30
R/LS008,0200	8	1.0	2.0	6.0	4.8	3.3	608	305021 0003	15,30	306021 0003	15,30
R/LS009,0100	9	1.8	1.0	6.2	5.5	3.6	609	305021 0019	15,30	306021 0019	15,30
R/LS009,0150	9	1.8	1.5	6.2	5.5	3.6	609	305021 0020	15,30	306021 0020	15,30
R/LS009,0200	9	1.8	2.0	6.2	5.5	3.6	609	305021 0021	15,30	306021 0021	15,30
R/LS009,0250	9	1.8	2.5	6.2	5.5	3.6	609	305021 0022	15,30	306021 0022	15,30
R/LS009,0300	9	1.8	3.0	6.2	5.5	3.6	609	305021 0023	15,30	306021 0023	15,30
R/LS011,0100	11	2.3	1.0	8.0	6.7	4.2	611	305021 0004	15,30	306021 0004	15,30
R/LS011,0150	11	2.3	1.5	8.0	6.7	4.2	611	305021 0005	15,30	306021 0005	15,30
R/LS011,0200	11	2.3	2.0	8.0	6.7	4.2	611	305021 0006	15,30	306021 0006	15,30
R/LS011,0250	11	2.3	2.5	8.0	6.7	4.2	611	305021 0007	15,30	306021 0007	15,30

3127

3127

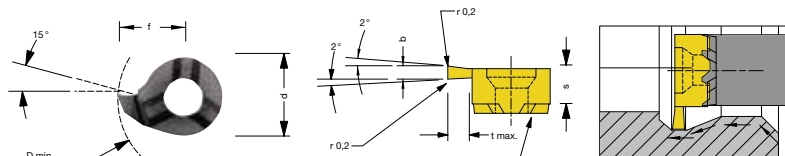
Continued on next page >>>



Model	D min. mm	t max. mm	b +0.03 mm	d mm	f mm	s mm	suitable tool holder	Right-hand art.no.	€	Left-hand art.no.	€	
R/LS011,0300	11	2.3	3.0	8.0	6.7	4.2	611	305021 0008	15,30	306021 0008	15,30	
R/LS014,0150	14	4.0	1.5	9.0	9.0	5.3	614	305021 0009	15,30	306021 0009	15,30	
R/LS014,0200	14	4.0	2.0	9.0	9.0	5.3	614	305021 0010	15,30	306021 0010	15,30	
R/LS014,0250	14	4.0	2.5	9.0	9.0	5.3	614	305021 0011	15,30	306021 0011	15,30	
R/LS014,0300	14	4.0	3.0	9.0	9.0	5.3	614	305021 0012	15,30	306021 0012	15,30	
R/LS016,0150	16	4.3	1.5	11.0	10.2	5.4	616	305021 0013	16,90	306021 0013	16,90	
R/LS016,0200	16	4.3	2.0	11.0	10.2	5.4	616	305021 0014	16,90	306021 0014	16,90	
R/LS016,0250	16	4.3	2.5	11.0	10.2	5.4	616	305021 0015	16,90	306021 0015	16,90	
R/LS016,0300	16	4.3	3.0	11.0	10.2	5.4	616	305021 0016	16,90	306021 0016	16,90	
R/LS016,0350	16	4.3	3.5	11.0	10.2	5.4	616	305021 0017	16,90	306021 0017	16,90	
R/LS016,0400	16	4.3	4.0	11.0	10.2	5.4	616	305021 0018	16,90	306021 0018	16,90	
									3127		3127	

**NC precision turning (internal)**

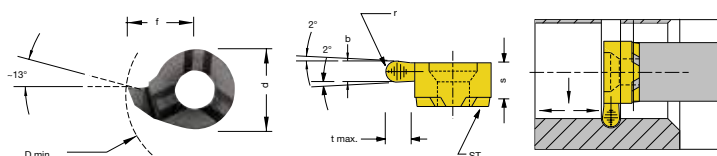
- Carbide HC8620, TIALN-coated
- Ap max. = 0.2 mm (maximum cutting depth)
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image



Model	D min. mm	t max. mm	b +0.05 mm	d mm	f mm	s mm	suitable tool holder	Right-hand art.no.	€	Left-hand art.no.	€	
R/LS08,150.02	8	1.0	1.5	6.0	4.8	3.3	608	305025 0001	17,20	306025 0001	17,20	
R/LS08,200.02	8	1.0	2.0	6.0	4.8	3.3	608	305025 0002	17,20	306025 0002	17,20	
R/LS09,150.02	9	1.8	1.5	6.2	5.5	3.6	609	305025 0009	17,30	306025 0008	18,85	
R/LS09,150.02,10	10	2.8	1.5	6.2	6.5	3.6	609	305025 0010	18,85	306025 0010	18,85	
R/LS09,200.02	9	1.8	2.0	6.2	5.5	3.6	609	305025 0008	18,85	306025 0009	17,30	
R/LS09,200.02,10	10	2.8	2.0	6.2	6.5	3.6	609	305025 0011	17,30	306025 0011	17,30	
R/LS11,100.02	11	2.3	1.0	8.0	6.7	4.2	611	305025 0012	18,85	306025 0012	18,85	
R/LS11,150.02	11	2.3	1.5	8.0	6.7	4.2	611	305025 0003	18,85	306025 0003	18,85	
R/LS11,200.02	11	2.3	2.0	8.0	6.7	4.2	611	305025 0004	17,30	306025 0004	17,30	
R/LS14,150.02	14	4.0	1.5	9.0	9.0	5.3	614	305025 0005	17,30	306025 0005	17,30	
R/LS14,200.02	14	4.0	2.0	9.0	9.0	5.3	614	305025 0006	17,30	306025 0006	17,30	
R/LS16,200.02	16	4.3	2.0	11.0	10.2	5.4	616	305025 0007	18,85	306025 0007	18,85	
									3127		3127	

**Recess turning (internal)**

- Full radius
- Carbide HC8620, TIALN-coated
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image



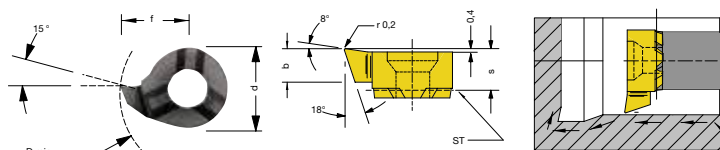
Model	D min. mm	t max. mm	b +0.05 mm	R mm	d mm	f mm	s mm	suitable tool holder	Right-hand art.no.	€	Left-hand art.no.	€
R/LS08,008R04	8	1	0.8	0.4	6.0	4.8	3.3	608	305030 0001	18,25	306030 0001	18,25
R/LS08,012R06	8	1	1.2	0.6	6.0	4.8	3.3	608	305030 0002	18,25	306030 0002	18,25
R/LS08,018R09	8	1	1.8	0.9	6.0	4.8	3.3	608	305030 0003	18,25	306030 0003	18,25
R/LS08,020R10	8	1.0	2.0	1.0	6.0	4.8	3.3	608	305030 0018	18,25	306030 0018	18,25
R/LS09,008R04	9	1.6	0.8	0.4	6.2	5.5	3.5	609	305030 0019	18,85	306030 0019	18,85
R/LS09,012R06	9	1.6	1.2	0.6	6.2	5.5	3.5	609	305030 0020	18,85	306030 0020	18,85
R/LS09,018R09	9	1.6	1.8	0.9	6.2	5.5	3.5	609	305030 0021	18,85	306030 0021	18,85
R/LS09,020R10	9	1.6	2.0	1.0	6.2	5.5	3.5	609	305030 0022	18,85	306030 0022	18,85
R/LS11,008R04	11	2.3	0.8	0.4	8.0	6.7	4.2	611	305030 0004	18,85	306030 0004	18,85
R/LS11,012R06	11	2.3	1.2	0.6	8.0	6.7	4.2	611	305030 0005	18,85	306030 0005	18,85
R/LS11,018R09	11	2.3	1.8	0.9	8.0	6.7	4.2	611	305030 0006	18,85	306030 0006	18,85
R/LS11,020R10	11	2.3	2.0	1.0	8.0	6.7	4.2	611	305030 0007	18,85	306030 0007	18,85
R/LS11,024R12	11	2.3	2.4	1.2	8.0	6.7	4.2	611	305030 0023	18,85	306030 0023	18,85
R/LS11,030R15	11	2.3	3.0	1.5	8.0	6.7	4.2	611	305030 0008	18,85	306030 0008	18,85
R/LS14,008R04	14	4.0	0.8	0.4	9.0	9.0	5.3	614	305030 0024	19,65	306030 0024	19,65
R/LS14,012R06	14	4.0	1.2	0.6	9.0	9.0	5.3	614	305030 0009	19,65	306030 0009	19,65
R/LS14,018R09	14	4.0	1.8	0.9	9.0	9.0	5.3	614	305030 0010	19,65	306030 0010	19,65
R/LS14,020R10	14	4.0	2.0	1.0	9.0	9.0	5.3	614	305030 0011	19,65	306030 0011	19,65
									3127		3127	



Model	D min. mm	t max. mm	b +0.05 mm	R mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
									art.no.	€	art.no.	€
R/LS14,022R11	14	4.0	2.2	1.1	9.0	9.0	5.3	614	305030 0012	19,65	306030 0012	19,65
R/LS14,030R15	14	4.0	3.0	1.5	9.0	9.0	5.3	614	305030 0013	19,65	306030 0013	19,65
R/LS16,018R09	16	4.3	1.8	0.9	11.0	10.2	5.4	616	305030 0014	20,30	306030 0014	20,30
R/LS16,020R10	16	4.3	2.0	1.0	11.0	10.2	5.4	616	305030 0026	20,30	306030 0026	20,30
R/LS16,022R11	16	4.3	2.2	1.1	11.0	10.2	5.4	616	305030 0015	20,30	306030 0015	20,30
R/LS16,024R12	16	4.3	2.4	1.2	11.0	10.2	5.4	616	305030 0027	20,30	306030 0027	20,30
R/LS16,030R15	16	4.3	3.0	1.5	11.0	10.2	5.4	616	305030 0016	20,30	306030 0016	20,30
R/LS16,032R16	16	4.3	3.2	1.6	11.0	10.2	5.4	616	305030 0028	20,30	306030 0028	20,30
R/LS16,040R20	16	4.3	4.0	2.0	11.0	10.2	5.4	616	305030 0017	20,30	306030 0017	20,30
									3127		3127	

**Turning and copying (internal)**

- Carbide HC8620, TIALN-coated
- Ap max. = maximum cutting depth
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image

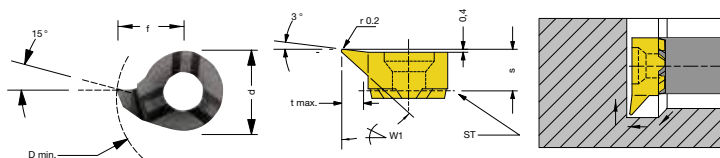


Model	D min. mm	ap max. mm	b mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand		
								art.no.	€	art.no.	€	
R/LS08,1846,02	7.8	0.6	3.3	6.0	4.65	3.5	608	305035 0001	17,30	306035 0001	17,30	
R/LS11,1855,02	9.8	1.0	3.9	8.0	5.50	4.2	611	305035 0002	17,30	306035 0002	17,30	
R/LS11,1867,02	11.0	1.0	3.9	8.0	6.70	4.2	611	305035 0003	16,80	306035 0003	16,80	
R/LS14,1867,02	13.8	1.5	5.0	9.0	8.70	5.3	614	305035 0004	16,80	306035 0004	16,80	
R/LS16,1897,02	15.5	1.5	5.0	11.0	9.70	5.4	616	305035 0005	18,45	306035 0005	18,45	
									3127		3127	

**Internal turning, internal thread undercuts (DIN 509)**

- Carbide HC8620, TIALN-coated
- Ap max. = maximum cutting depth
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image

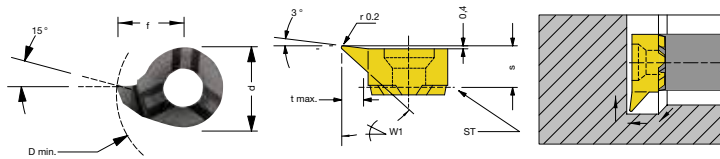
**Internal turning and internal thread undercuts (DIN 509), angle W1 = 47°**



Model	D min. mm	t max. mm	ap max. mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand		
								art.no.	€	art.no.	€	
R/LS08,4746,02	7.8	1.2	0.4	6.0	4.65	3.5	608	305040 0001	17,40	306040 0001	17,40	
R/LS11,4767,02	11.0	2.3	0.6	8.0	6.70	4.2	611	305040 0002	16,90	306040 0002	16,90	
R/LS14,4787,02	13.7	3.0	0.8	9.0	8.70	5.3	614	305040 0003	17,40	306040 0003	17,40	
									3127		3127	

**Copying**

- Carbide HC8620, TIALN-coated
- Ap max. = maximum cutting depth
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image
- Copying, angle W1 = 30°



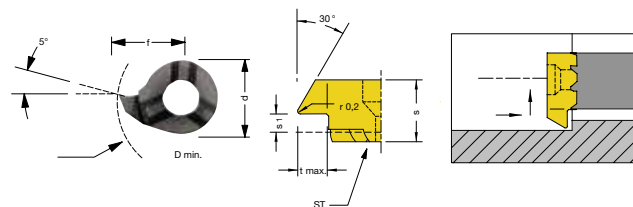
Model	D min. mm	t max. mm	ap max. mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand		
								art.no.	€	art.no.	€	
R/LS08,2555,02	7.8	1.2	0.4	6.0	4.65	3.5	608	305045 0001	20,10	306045 0001	20,10	
R/LS11,2755,02	11.0	2.3	0.6	8.0	6.70	4.2	611	305045 0002	19,55	306045 0002	19,55	
R/LS14,3555,02	13.7	4.0	0.8	9.0	8.70	5.3	614	305045 0003	20,10	306045 0003	20,10	
R/LS16,4055,02	15.8	4.3	0.8	11.0	10.20	5.4	616	305045 0004	21,90	306045 0004	21,90	
									3127		3127	

Continued on next page >>>

**Reverse turning (internal)**

• Carbide HC8620, TIALN-coated

- Ap max. = maximum cutting depth
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image

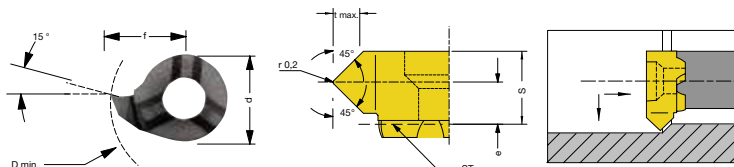


Model	D min. mm	t max. mm	ap max. mm	s1 mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
									art.no.	€	art.no.	€
R/LS08,3046,02	7.8	1.3	0.6	1.0	6.0	4.65	3.5	608	305050 0001	19,95	306050 0001	19,95
R/LS09,3055,02	9.0	1.7	0.8	1.2	6.2	5.50	3.55	609	305050 0004	19,25	306050 0004	19,25
R/LS09,3065,02	10.0	2.3	0.8	1.2	6.2	6.50	3.55	609	305050 0005	19,25	306050 0005	19,25
R/LS11,3067,02	11.0	2.3	1.0	1.6	8.0	6.70	4.3	611	305050 0002	19,25	306050 0002	19,25
R/LS14,3087,02	13.8	3.5	1.5	2.4	9.0	8.70	5.4	614	305050 0003	19,95	306050 0003	19,95
									3127			3127

**Chamfering and turning (internal)**

• Carbide HC8620, TIALN-coated

- Ap max. = maximum cutting depth
- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image

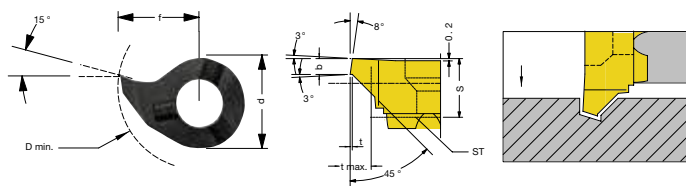


Model	D min. mm	t max. mm	ap max. mm	e mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
									art.no.	€	art.no.	€
R/LS08,4545,02	8.0	1.4	0.6	1.6	6.0	4.8	3.7	608	305055 0001	16,50	306055 0001	16,50
R/LS09,4545,02	9.0	1.3	0.8	1.8	6.2	5.5	3.55	609	305055 0004	16,50	306055 0004	16,50
R/LS11,4545,02	11.0	1.5	1.0	2.2	8.0	6.7	4.3	611	305055 0002	16,50	306055 0002	16,50
R/LS14,4545,02	14.0	1.5	1.2	2.7	9.0	9.0	5.35	614	305055 0003	17,80	306055 0003	17,80
									3127			3127

**Roughing and chamfering (internal)**

• Carbide HC8620, TIALN-coated

- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image
- t = 0.2 mm

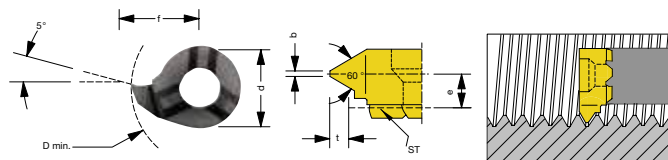


Model	D min. mm	t max. mm	b mm	d mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand		
								art.no.	€	art.no.	€	
R/LS08,0810,45	8.0	1.0	1.0	6.0	4.8	3.3	608	305060 0001	16,90	306060 0001	16,90	
R/LS09,0810,45	9.0	1.5	1.0	6.2	5.5	3.6	609	305055 0005	16,90	306055 0005	16,90	
R/LS11,0810,45	11.0	1.5	1.0	8.0	6.7	4.2	611	305060 0002	16,90	306060 0002	16,90	
R/LS14,0815,45	14.0	1.5	1.0	9.0	9.0	5.3	614	305060 0003	16,90	306060 0003	16,90	
R/LS16,0815,45	16.0	1.5	1.0	11.0	10.2	5.4	616	305060 0004	16,90	306060 0004	16,90	
									3127			3127

**Thread turning (internal), coarse-pitch thread, partial profile 60°**

• Carbide HC8620, TIALN-coated

- ST = tool holder front face
- R = right-hand, as shown
- L = left-hand, mirror image
- All other thread types are available on request



Model	D min. mm	Pitch mm	t mm	e mm	b mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
									art.no.	€	art.no.	€
R/LS08,0205,01	8.0	0.5-0.75	0.43	2.95	0.06	4.8	3.4	608	305065 0007	20,30	306065 0007	20,30
R/LS08,0510,01	8.0	1.0-1.25	0.70	2.7	0.12	4.8	3.4	608	305065 0008	20,30	306065 0008	20,30
R/LS08,0815,01	8.0	1.5-1.75	0.95	2.5	0.18	4.8	3.4	608	305065 0001	20,30	306065 0001	20,30
R/LS09,0205,01	9.0	0.5-0.75	0.27	3.2	0.06	5.5	3.55	609	305065 0009	20,30	306065 0009	20,30
R/LS09,0510,01	9.0	1.0-1.25	0.54	3.0	0.12	5.5	3.55	609	305065 0010	20,30	306065 0010	20,30
R/LS09,0815,01	9.0	1.5-1.75	0.81	2.8	0.18	5.5	3.55	609	305065 0011	20,30	306065 0011	20,30
R/LS09,0917,01	9.0	1.75-2.0	0.95	2.6	0.20	5.5	3.55	609	305065 0012	20,30	306065 0012	20,30
R/LS09,1020,01	9.0	2.0-2.5	1.08	2.5	0.25	5.5	3.55	609	305065 0013	20,30	306065 0013	20,30
R/LS09,1325,01	9.0	2.5-3.0	1.35	2.1	0.31	5.5	3.55	609	305065 0014	20,30	306065 0014	20,30
R/LS09,1630,01	9.0	3.0-3.5	1.62	1.9	0.37	5.5	3.55	609	305065 0015	20,30	306065 0015	20,30
R/LS11,0205,01	11.0	0.5-0.75	0.41	3.75	0.06	6.7	4.2	611	305065 0016	20,30	306065 0016	20,30
R/LS11,0510,01	11.0	1.0-1.25	0.55	3.6	0.12	6.7	4.2	611	305065 0017	20,30	306065 0017	20,30
									3127			3127

Model	D min. mm	Pitch mm	t mm	e mm	b mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
									art.no.	€	art.no.	€
R/LS11,0815,01	11.0	1.5-1.75	0.81	3.4	0.18	6.7	4.2	611	305065 0018	20,30	306065 0018	20,30
R/LS11,1020,01	11.0	2.0-2.5	1.08	3.0	0.25	6.7	4.3	611	305065 0002	20,30	306065 0002	20,30
R/LS11,1325,01	11.0	2.5-3.0	1.35	3.0	0.31	6.7	4.3	611	305065 0003	20,30	306065 0003	20,30
R/LS14,0510,01	14.0	1.0-1.25	0.55	4.6	0.12	9.0	5.4	614	305065 0019	20,30	306065 0019	20,30
R/LS14,0815,01	14.0	1.5-1.75	0.81	4.3	0.18	9.0	5.4	614	305065 0020	20,30	306065 0020	20,30
R/LS14,1020,01	14.0	2.0-2.5	1.08	4.2	0.25	9.0	5.4	614	305065 0004	20,30	306065 0004	20,30
R/LS14,1325,01	14.0	2.5-3.0	1.35	4.7	0.31	9.0	5.4	614	305065 0005	20,30	306065 0005	20,30
R/LS16,0510,01	16.0	1.0-1.25	0.55	4.8	0.12	10.2	5.4	616	305065 0021	20,30	306065 0021	20,30
R/LS16,0815,01	16.0	1.5-1.75	0.81	4.6	0.18	10.2	5.4	616	305065 0022	20,30	306065 0022	20,30
R/LS16,1020,01	16.0	2.0-2.5	1.08	4.35	0.25	10.2	5.4	616	305065 0023	20,30	306065 0023	20,30
R/LS16,1325,01	16.0	2.5-3.0	1.35	4.15	0.31	10.2	5.4	616	305065 0006	20,30	306065 0006	20,30

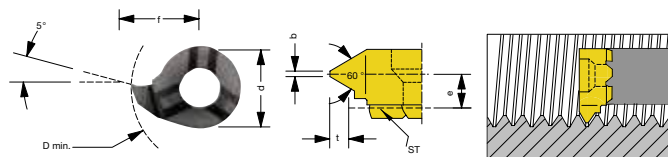
3127

3127

**Thread turning (internal), coarse-pitch thread, full profile 60°**

• Carbide HC8620 TIALN-coated

- ST = clamp mounting front face
- R = right-hand, as shown
- L = left-hand, mirror image
- All other thread types are available on request



Model	D min. mm	n mm	s mm	b mm	f mm	e mm	d mm	suitable tool holder	Right-hand		Left-hand	
									art.no.	€	art.no.	€
R/LS09,0205,02	9.0	0.5	3.65	0.06	5.5	3.25	6.2	609	305075 0010	22,50	306075 0010	22,50
R/LS09,0510,02	9.0	1.0	3.65	0.12	5.5	3.0	6.2	609	305075 0011	22,50	306075 0011	22,50
R/LS09,0815,02	9.0	1.5	3.6	0.18	5.5	2.8	6.2	609	305075 0012	22,50	306075 0012	22,50
R/LS09,0917,02	9.0	1.75	3.6	0.2	5.5	2.7	6.2	609	305075 0013	22,50	306075 0013	22,50
R/LS09,1020,02	9.0	2.0	3.55	0.25	5.5	2.6	6.2	609	305075 0014	22,50	306075 0014	22,50
R/LS09,1325,02	9.0	2.5	3.55	0.31	5.5	2.5	6.2	609	305075 0015	22,50	306075 0015	22,50
R/LS09,1630,02	9.0	3.0	3.55	0.37	5.5	2.5	6.2	609	305075 0016	22,50	306075 0016	22,50
R/LS11,1020,02	11	2.0	4.3	0.25	6.7	2.9	8.0	611	305075 0001	22,50	306075 0001	22,50
R/LS11,1325,02	11	2.5	4.3	0.31	6.7	2.95	8.0	611	305075 0002	22,50	306075 0002	22,50
R/LS11,1630,02	11	3.0	4.3	0.37	6.7	2.9	8.0	611	305075 0003	22,50	306075 0003	22,50
R/LS14,1020,02	14	2.0	5.4	0.25	9.0	4.2	9.0	614	305075 0004	20,70	306075 0004	20,70
R/LS14,1325,02	14	2.5	5.4	0.31	9.0	3.65	9.0	614	305075 0005	20,70	306075 0005	20,70
R/LS16,1325,02	16	2.5	5.5	0.31	10.2	4.2	11.0	616	305075 0006	25,10	306075 0006	25,10
R/LS16,1630,02	16	3.0	5.5	0.37	10.2	4.0	11.0	616	305075 0007	25,10	306075 0007	25,10
R/LS16,1835,02	16	3.5	5.5	0.43	10.2	3.9	11.0	616	305075 0008	25,10	306075 0008	25,10
R/LS16,2140,02	16	4.0	5.5	0.50	10.2	3.6	11.0	616	305075 0009	25,10	306075 0009	25,10

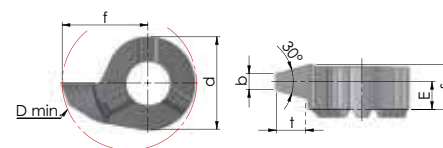
3127

3127

**Thread turning (internal), trapezoid thread, partial profile**

• Carbide HC8620 TIALN-coated

- ST = clamp mounting front face
- R = right-hand, as shown
- L = left-hand, mirror image

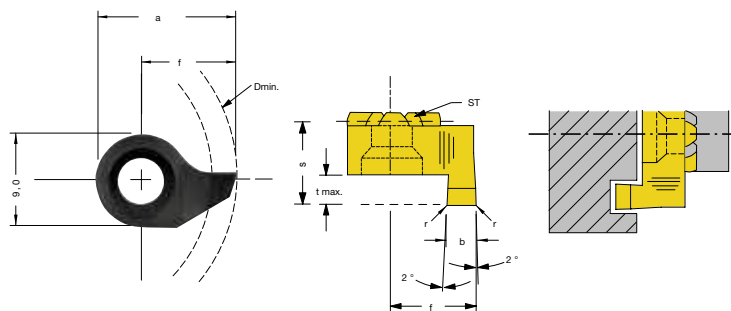


Model	D min. mm	n mm	t mm	s mm	b mm	f mm	e mm	d mm	suitable tool holder	Right-hand		Left-hand	
										art.no.	€	art.no.	€
R/LS09,1015,01	9	1.5	0.9	3.55	0.47	5.5	3.0	6.2	609	305090 0013	20,90	306090 0013	20,90
R/LS09,1220,01	9	2.0	1.25	3.55	0.6	5.5	2.85	6.2	609	305090 0014	20,90	306090 0014	20,90
R/LS09,1730,01	9	3.0	1.75	3.55	0.96	5.5	2.25	6.2	609	305090 0015	20,90	306090 0015	20,90
R/LS09,2240,01	10	4.0	2.25	3.55	1.33	6.5	2.25	6.2	609	305090 0016	20,90	306090 0016	20,90
R/LS11,1015,01	11	1.5	0.9	4.3	0.9	6.7	3.7	8.0	611	305090 0001	20,90	306090 0001	20,90
R/LS11,1220,01	11	2.0	1.25	4.3	0.6	6.7	3.5	8.0	611	305090 0002	20,90	306090 0002	20,90
R/LS11,1730,01	11	3.0	1.75	4.3	0.96	6.7	3.2	8.0	611	305090 0003	20,90	306090 0003	20,90
R/LS11,2240,01	11	4.0	2.25	4.0	1.33	6.7	2.6	8.0	611	305090 0004	20,90	306090 0004	20,90
R/LS14,1220,01	14	2.0	1.25	5.3	0.6	9.0	4.3	9.0	614	305090 0005	21,50	306090 0005	21,50
R/LS14,1730,01	14	3.0	1.75	5.3	0.96	9.0	4.0	9.0	614	305090 0006	21,50	306090 0006	21,50
R/LS14,2240,01	14	4.0	2.25	5.3	1.33	9.0	4.0	9.0	614	305090 0007	21,50	306090 0007	21,50
R/LS14,2750,01	14	5.0	2.75	5.3	1.69	9.0	3.55	9.0	614	305090 0008	21,50	306090 0008	21,50
R/LS16,1220,01	16	2.0	1.25	5.5	0.6	9.7	4.5	11	616	305090 0009	23,70	306090 0009	23,70
R/LS16,1730,01	16	3.0	1.75	5.5	0.96	9.7	4.3	11	616	305090 0010	23,70	306090 0010	23,70
R/LS16,2240,01	16	4.0	2.25	5.5	1.33	9.7	4.0	11	616	305090 0011	23,70	306090 0011	23,70
R/LS16,2750,01	16	5.0	2.75	5.5	1.69	10.2	3.6	11	616	305090 0012	23,70	306090 0012	23,70

3127

3127

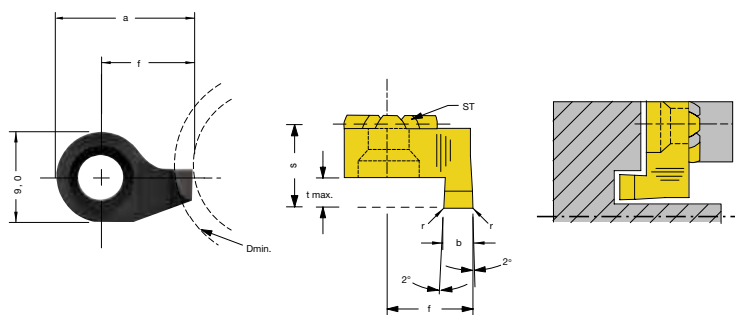
Continued on next page >>>



**Axial grooving, right-hand cutting**

- Carbide HC8620, TIALN-coated
- ST = tool holder front face
- R = right, right-hand cutting insert as shown
- L = left, mirror image left-hand cutting insert

Model	D min. mm	t max. mm	b +0.03 mm	a mm	r mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
									art.no.	€	art.no.	€
R/LS014,1410,00	14.0	1.5	1.0	13.5	0.2	9.0	8.3	614	305100 0001	16,30	306100 0001	16,30
R/LS014,1415,02	14.0	2.5	1.5	13.5	0.2	9.0	8.3	614	305100 0002	16,30	306100 0002	16,30
R/LS014,1420,02	14.0	3.0	2.0	13.5	0.2	9.0	8.3	614	305100 0003	16,30	306100 0003	16,30
R/LS014,1420,52	14.0	5.0	2.0	13.5	0.2	9.0	10.3	614	305100 0006	18,85	306100 0006	18,85
R/LS014,1425,02	14.0	3.0	2.5	13.5	0.2	9.0	8.3	614	305100 0004	16,30	306100 0004	16,30
R/LS014,1425,52	14.0	5.0	2.5	13.5	0.2	9.0	10.3	614	305100 0007	18,85	306100 0007	18,85
R/LS014,1430,02	14.0	3.0	3.0	13.5	0.2	9.0	8.3	614	305100 0005	16,30	306100 0005	16,30
R/LS014,1430,52	14.0	5.0	3.0	13.5	0.2	9.0	10.3	614	305100 0008	18,85	306100 0008	18,85
									3127		3127	



**Axial grooving, left-hand cutting past pins**

- Carbide HC8620, TIALN-coated
- ST = tool holder front face
- R = right, left-hand cutting insert as shown
- L = left, mirror image right-hand cutting insert

Model	D min. mm	t max. mm	b +0.03 mm	a mm	r mm	f mm	s mm	suitable tool holder	Right-hand		Left-hand	
									art.no.	€	art.no.	€
R/LS014,1210,00	12.0	1.5	1.0	11.5	-	7.0	8.3	614	305095 0001	16,90	306095 0001	16,90
R/LS014,1215,02	12.0	2.5	1.5	12.0	0.2	7.5	8.3	614	305095 0002	17,30	306095 0002	17,30
R/LS014,1220,02	12.0	3.0	2.0	12.5	0.2	8.0	8.3	614	305095 0003	17,30	306095 0003	17,30
R/LS014,1220,52	12.0	5.0	2.0	12.5	0.2	8.0	10.3	614	305095 0006	19,75	306095 0006	19,75
R/LS014,1225,02	12.0	3.0	2.5	13.0	0.2	8.5	8.3	614	305095 0004	17,30	306095 0004	17,30
R/LS014,1225,52	12.0	5.0	2.5	13.0	0.2	8.5	10.3	614	305095 0007	19,75	306095 0007	19,75
R/LS014,1230,02	12.0	3.0	3.0	13.5	0.2	9.0	8.3	614	305095 0005	17,30	306095 0005	17,30
R/LS014,1230,52	12.0	5.0	3.0	13.5	0.2	9.0	10.3	614	305095 0008	19,75	306095 0008	19,75
									3127		3127	

**SOLID CARBIDE MILLING CUTTERS  
AT THEIR  
BEST**



**VAN HOORN**  
End milling cutters  
189 pages  
Art.no. 019900 0079

Overview of all free manufacturers' catalogues  
on page 16/17

**from a diameter of 0.6 mm,  
with internal coolant supply**

Hollow turning, internal plunge turning, internal turning and chamfering, roughing and internal chamfering for subsequent parting as well as internal threading for small bore diameters continually pose new problems for production – problems that can often be solved only with special tools.

Mini-bore has been developed specifically to solve these problems and offers optimum conditions for cost-effective bore machining with diameters starting from 0.6 mm. The favourable cost-breakdown of the cutting inserts means that custom productions are no longer worthwhile.

The cutting inserts, available in right-hand and left-hand designs, are supported by a tool holder that can be used for both designs. The tool holder and cutting inserts are fitted with an internal coolant supply.

**Cutting material**

**K10F** uncoated, all-purpose fine-grain carbide metal, suitable for application at low and medium cutting speeds and for machining non-ferrous metals

**CN45F TiN coated**

All-rounder, for medium to high cutting speeds, with restrictions for non-ferrous metals

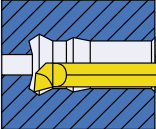

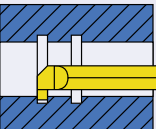
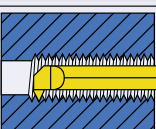
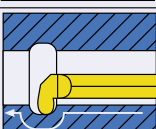
**AL41F TiAlN coated**

High temperature resistance at high hardness levels, also very well suited to non-ferrous metals

**Special designs**

If you have internal machining problems that cannot be handled with the cutting insert sizes listed here, we will be pleased to present you with possible solutions.

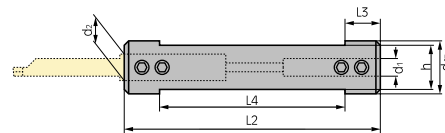

**from  $\varnothing$  0,6 mm**

	<b>Hollow turning</b> from diameters of 0.6 mm / up to 7 x D	
	<b>Internal plunge turning</b> from diameters of 4 mm / up to 7 x D	
	<b>Hollow turning and chamfering</b> from diameters of 5 mm	
	<b>Internal roughing and chamfering</b> for subsequent parting-off from diameters of 5 mm	
	<b>Axial groove turning</b> from external groove diameters of 15 mm	
	<b>Internal threading</b> from diameters of 4 mm	
	<b>Internal plunge turning</b> from diameters of 4 mm, full radius (on request)	

**Dümmel® Tool holder mini-børe**  
WERKZEUGFABRIK



- **With internal coolant supply**
- For holding right-hand and left-hand cutting inserts
- Two different holder Ø measurements (d1 and d2)
- Central coolant supply through the tool holder
- Axial position of the cutting inserts in the tool holder can be precisely reproduced via a built-in depth stop
- Radial position of the cutting edge is guaranteed by tension applied to the lateral clamping surface of the cutting inserts by the clamping screws
- Size O316 and O320 for 304450.... and 304455.... and high-pressure applications with central cooling hole



Designation	suitable cutting inserts	d1 mm	d2 mm	d f7 mm	L2 mm	L3 mm	L4 mm	h mm	art.no.	€
645,0012-D	4 / 5	4	5	12.0	75	10	55	10.3	<b>304001 0012</b>	<b>93,60</b>
645,0016-D	4 / 5	4	5	16.0	75	10	55	14.0	304001 0016	98,20
645,0020-D	4 / 5	4	5	20.0	90	10	70	18.0	304001 0020	106,-
676,0016-D	6 / 7	6	7	16.0	75	10	55	14.0	304001 0216	98,20
676,0020-D	6 / 7	6	7	20.0	90	10	70	18.0	304001 0220	106,-
687,0016-D	7 / 8	7	8	16.0	75	10	55	14.0	304001 0316	109,-
687,0020-D	7 / 8	7	8	20.0	90	10	70	18.0	304001 0320	116,-
681,0020-D	8 / 10	8	10	20.0	100	10	80	18.0	304001 0420	120,50

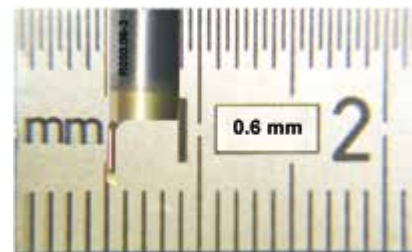
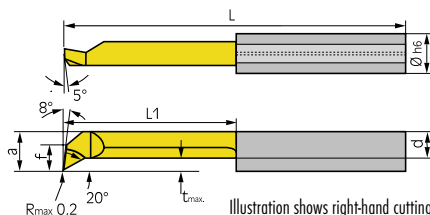
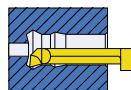
3125

**Dümmel® Cutting inserts mini-børe**  
WERKZEUGFABRIK



- **With internal coolant supply**
- Straight shank and lateral clamping surface
- Right-hand and left-hand versions
- **Cutting material:**  
**K10F** finest grain carbide, uncoated,  
**CN45F** finest grain carbide **TiN** coated,  
**AL41F** superfine grain carbide **TiAlN**

**From Ø 0.6 mm  
L1 to 7 x D**



**Internal turning**

- From 2.0 mm bore diameter
- Cutting inserts, uncoated

Designation	D h6 mm	f mm	r mm	d mm	a mm	L mm	L1 mm	t max. mm	D min. mm	suitable tool holder	ISO <b>NK</b>		ISO <b>NK</b>	
											<b>K10F right-hand</b> art.no.	€	<b>K10F left-hand</b> art.no.	€
R/L 050,2-5	4.0		0.05	1.5	1.7	19	5	0.1	2.0	645...	<b>304101 0101</b>	<b>20,10</b>	<b>304105 0101</b>	<b>20,10</b>
R/L 050,2-10	4.0		0.05	1.5	1.7	24	10	0.1	2.0	645...	304101 0102	20,70	304105 0102	20,70
R/L 050,2-15	4.0		0.05	1.5	1.7	29	15	0.1	2.0	645...	304101 0103	22,-	304105 0103	22,-
R/L 050,3-10	4.0	0.6	0.1	2.3	2.6	24	10	0.2	2.8	645...	304101 0001	19,95	304105 0001	19,95
R/L 050,3-16	4.0	0.6	0.1	2.3	2.6	30	16	0.2	2.8	645...	304101 0403	21,30	304105 0403	21,30
R/L 050,3-20	4.0	0.6	0.1	2.3	2.6	34	20	0.2	2.8	645...	304101 0003	26,50	304105 0003	26,50
R/L 050,4-10	4.0	1.5	0.1	3.0	3.5	24	10	0.3	4.0	645...	304101 0010	19,95	304105 0010	19,95
R/L 050,4-16	4.0	1.5	0.1	3.0	3.5	30	16	0.3	4.0	645...	304101 0404	21,30	304105 0404	21,30
R/L 050,4-20	4.0	1.5	0.1	3.0	3.5	34	20	0.3	4.0	645...	304101 0012	24,90	304105 0012	24,90
R/L 050,5-10	5.0	1.9	0.15	3.8	4.4	25	10	0.5	5.0	645...	304101 0020	18,55	304105 0020	18,55
R/L 050,5-15	5.0	1.9	0.15	3.8	4.4	30	15	0.5	5.0	645...	304101 0021	19,95	304105 0021	19,95
R/L 050,5-20	5.0	1.9	0.15	3.8	4.4	35	20	0.5	5.0	645...	304101 0505	23,50	304105 0505	23,50
R/L 050,5-25	5.0	1.9	0.15	3.8	4.4	40	25	0.5	5.0	645...	304101 0023	27,30	304105 0023	27,30
R/L 050,5-30	5.0	1.9	0.15	3.8	4.4	45	30	0.5	5.0	645...	304101 0024	31,30	304105 0024	31,30
R/L 050,6-15	6.0	2.3	0.15	4.5	5.3	30	15	0.5	6.0	676...	304101 0030	19,95	304105 0030	19,95
R/L 050,6-22	6.0	2.3	0.15	4.5	5.3	37	22	0.5	6.0	676...	304101 0606	23,50	304105 0606	23,50
R/L 050,6-25	6.0	2.3	0.15	4.5	5.3	40	25	0.5	6.0	676...	304101 0032	27,30	304105 0032	27,30
R/L 050,6-30	6.0	2.3	0.15	4.5	5.3	45	30	0.5	6.0	676...	304101 0033	31,30	304105 0033	31,30
R/L 050,7-20	7.0	2.8	0.15	5.5	6.3	35	20	0.6	6.8	676...	304101 0040	23,70	304105 0040	23,70
R/L 050,7-25	7.0	2.8	0.15	5.5	6.3	40	25	0.6	6.8	676...	304101 0041	27,70	304105 0041	27,70
R/L 050,7-30	7.0	2.8	0.15	5.5	6.3	45	30	0.6	6.8	676...	304101 0042	31,70	304105 0042	31,70

3125

3125



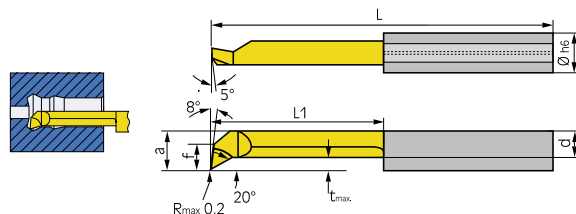
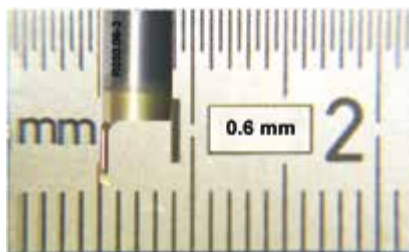


Illustration shows right-hand cutting

**Internal turning**

**• Coated cutting inserts CN45F**

- From 0.6 mm bore diameter

Designation	D h6 mm	f mm	r mm	d mm	a mm	L mm	L1 mm	t max. mm	D min. mm	suitable tool holder	ISO		ISO	
											CN45F TiN right-hand art.no.	€	CN45F TiN left-hand art.no.	€
R/L 050,06-2	4.0		0.04	0.4	0.5	20	2	0.08	0.6	645...	304110 0050	29,70	304115 0050	29,70
R/L 050,06-3	4.0		0.04	0.4	0.5	20	3	0.08	0.6	645...	304110 0051	30,70	304115 0051	30,70
R/L 050,15-5	4.0		0.05	1.15	1.3	19	5	0.1	1.5	645...	304110 0060	28,30	304115 0060	28,30
R/L 050,15-10	4.0		0.05	1.15	1.3	24	10	0.1	1.5	645...	304110 0061	29,10	304115 0061	29,10
R/L 050,2-5	4.0		0.05	1.5	1.7	19	5	0.1	2.0	645...	304110 0101	24,10	304115 0101	24,10
R/L 050,2-10	4.0		0.05	1.5	1.7	24	10	0.1	2.0	645...	304110 0102	24,70	304115 0102	24,70
R/L 050,2-15	4.0		0.05	1.5	1.7	29	15	0.1	2.0	645...	304110 0103	26,10	304115 0103	26,10
R/L 050,3-10	4.0	0.6	0.1	2.3	2.6	24	10	0.2	2.8	645...	304110 0001	23,90	304115 0001	23,90
R/L 050,3-16	4.0	0.6	0.1	2.3	2.6	30	16	0.2	2.8	645...	304110 0403	25,40	304115 0403	25,40
R/L 050,3-20	4.0	0.6	0.1	2.3	2.6	34	20	0.2	2.8	645...	304110 0003	30,50	304115 0003	30,50
R/L 050,4-10	4.0	1.5	0.1	3.0	3.5	24	10	0.3	4.0	645...	304110 0010	23,90	304115 0010	23,90
R/L 050,4-16	4.0	1.5	0.1	3.0	3.5	30	16	0.3	4.0	645...	304110 0404	25,40	304115 0404	25,40
R/L 050,4-20	4.0	1.5	0.1	3.0	3.5	34	20	0.3	4.0	645...	304110 0012	28,90	304115 0012	28,90
R/L 050,4-24	4.0	1.5	0.1	3.0	3.5	38	24	0.3	4.0	645...	304110 0070	32,10	304115 0070	32,10
R/L 050,4-28	4.0	1.5	0.1	3.0	3.5	42	28	0.3	4.0	645...	304110 0071	35,70	304115 0071	35,70
R/L 050,5-10	5.0	1.9	0.15	3.8	4.4	25	10	0.5	5.0	645...	304110 0020	22,40	304115 0020	22,40
R/L 050,5-15	5.0	1.9	0.15	3.8	4.4	30	15	0.5	5.0	645...	304110 0021	23,90	304115 0021	23,90
R/L 050,5-20	5.0	1.9	0.15	3.8	4.4	35	20	0.5	5.0	645...	304110 0505	27,60	304115 0505	27,60
R/L 050,5-25	5.0	1.9	0.15	3.8	4.4	40	25	0.5	5.0	645...	304110 0023	31,30	304115 0023	31,30
R/L 050,5-30	5.0	1.9	0.15	3.8	4.4	45	30	0.5	5.0	645...	304110 0024	35,10	304115 0024	35,10
R/L 050,5-35	5.0	1.9	0.15	3.8	4.4	50	35	0.5	5.0	645...	304110 0080	39,10	304115 0080	39,10
R/L 050,6-15	6.0	2.3	0.15	4.5	5.3	30	15	0.5	6.0	676...	304110 0030	23,90	304115 0030	23,90
R/L 050,6-22	6.0	2.3	0.15	4.5	5.3	37	22	0.5	6.0	676...	304110 0606	27,60	304115 0606	27,60
R/L 050,6-25	6.0	2.3	0.15	4.5	5.3	40	25	0.5	6.0	676...	304110 0032	31,30	304115 0032	31,30
R/L 050,6-30	6.0	2.3	0.15	4.5	5.3	45	30	0.5	6.0	676...	304110 0033	35,10	304115 0033	35,10
R/L 050,6-35	6.0	2.3	0.15	4.5	5.3	50	35	0.5	6.0	676...	304110 0150	39,10	304115 0150	39,10
R/L 050,6-42	6.0	2.3	0.15	4.5	5.3	57	42	0.5	6.0	676...	304110 0151	43,60	304115 0151	43,60
R/L 050,7-20	7.0	2.8	0.15	5.5	6.3	35	20	0.6	6.8	676...	304110 0040	27,80	304115 0040	27,80
R/L 050,7-25	7.0	2.8	0.15	5.5	6.3	40	25	0.6	6.8	676...	304110 0041	31,70	304115 0041	31,70
R/L 050,7-30	7.0	2.8	0.15	5.5	6.3	45	30	0.6	6.8	676...	304110 0042	35,70	304115 0042	35,70
R/L 050,7-35	7.0	2.8	0.15	5.5	6.3	50	35	0.6	7.0	676...	304110 0160	39,70	304115 0160	39,70
R/L 050,7-40	7.0	2.8	0.15	5.5	6.3	55	40	0.6	7.0	676...	304110 0161	44,30	304115 0161	44,30
R/L 050,7-45	7.0	2.8	0.15	5.5	6.3	60	45	0.6	7.0	676...	304110 0162	46,90	304115 0162	46,90
R/L 050,7-50	7.0	2.8	0.15	5.5	6.3	65	50	0.6	7.0	676...	304110 0163	50,50	304115 0163	50,50
											3125		3125	

Continued on next page >>>



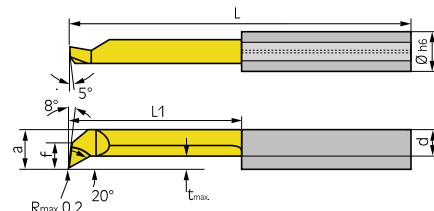
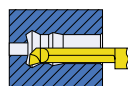
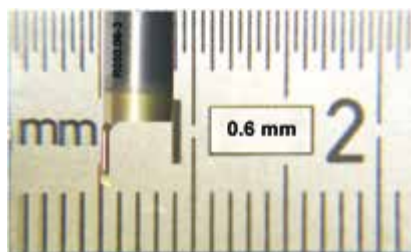


Illustration shows right-hand cutting

• Coated cutting inserts AL41F

• From 0.5 mm bore diameter

Designation	D h6 mm	f mm	r mm	a mm	L mm	L1 mm	t max. mm	D min. mm	suitable tool holder	ISO		ISO	
										AL41F right-hand art.no.	€	AL41F left-hand art.no.	€
R/L050,05-2	4.0		0.04	0.4	20	2		0.5	645...	<b>304120 0166</b>	<b>29,70</b>	<b>304125 0166</b>	<b>29,70</b>
R/L050,06-2	4.0		0.04	0.5	20	2	0.05	0.6	645...	304120 0050	29,70	304125 0050	29,70
R/L050,06-3	4.0		0.04	0.5	20	3	0.05	0.6	645...	304120 0051	30,70	304125 0051	30,70
R/L050,08-4	4.0		0.04	0.7	20	4	0.05	0.8	645...	304120 0052	30,70	304125 0052	30,70
R/L050,1-5	4.0		0.05	0.9	20	4.5	0.1	1.0	645...	304120 0053	28,30	304125 0053	28,30
R/L050,1-7	4.0		0.05	0.9	22	6.5	0.1	1.0	645...	304120 0054	29,10	304125 0054	29,10
R/L050,1-8	4.0		0.05	0.9	22	8	0.1	1.0	645...	304120 0055	30,40	304125 0055	30,40
R/L050,15-5	4.0		0.05	1.3	19	5	0.1	1.5	645...	304120 0060	28,30	304125 0060	28,30
R/L050,15-10	4.0		0.05	1.3	24	10	0.1	1.5	645...	304120 0061	29,10	304125 0061	29,10
R/L050,2-5	4.0		0.05	1.7	19	5	0.1	2.0	645...	304120 0101	24,10	304125 0101	24,10
R/L050,2-10	4.0		0.05	1.7	24	10	0.1	2.0	645...	304120 0102	24,70	304125 0102	24,70
R/L050,2-15	4.0		0.05	1.7	29	15	0.1	2.0	645...	304120 0103	26,10	304125 0103	26,10
R/L050,25-5	4.0	0.2	0.05	2.2	19	5	0.15	2.5	645...	304120 0104	24,10	304125 0104	24,10
R/L050,25-10	4.0	0.2	0.05	2.2	24	10	0.15	2.5	645...	304120 0105	24,70	304125 0105	24,70
R/L050,25-16	4.0	0.2	0.05	2.2	30	16	0.15	2.5	645...	304120 0106	26,10	304125 0106	26,10
R/L050,3-10	4.0	0.6	0.1	2.6	24	10	0.2	2.8	645...	304120 0001	23,90	304125 0001	23,90
R/L050,3-16	4.0	0.6	0.1	2.6	30	16	0.2	2.8	645...	304120 0403	25,40	304125 0403	25,40
R/L050,3-20	4.0	0.6	0.1	2.6	34	20	0.2	2.8	645...	304120 0003	30,50	304125 0003	30,50
R/L050,35-10	4.0	1.1	0.1	3.1	24	10	0.25	3.5	645...	304120 0004	23,90	304125 0004	23,90
R/L050,35-16	4.0	1.1	0.1	3.1	30	16	0.25	3.5	645...	304120 0005	25,40	304125 0005	25,40
R/L050,35-20	4.0	1.1	0.1	3.1	34	20	0.25	3.5	645...	304120 0006	30,50	304125 0006	30,50
R/L050,35-24	4.0	1.1	0.1	3.1	38	24	0.25	3.5	645...	304120 0007	33,40	304125 0007	33,40
R/L050,4-10	4.0	1.5	0.1	3.5	24	10	0.3	4.0	645...	304120 0010	23,90	304125 0010	23,90
R/L050,4-16	4.0	1.5	0.1	3.5	30	16	0.3	4.0	645...	304120 0404	25,40	304125 0404	25,40
R/L050,4-20	4.0	1.5	0.1	3.5	34	20	0.3	4.0	645...	304120 0012	28,90	304125 0012	28,90
R/L050,4-24	4.0	1.5	0.1	3.5	38	24	0.3	4.0	645...	304120 0070	32,10	304125 0070	32,10
R/L050,4-28	4.0	1.5	0.1	3.5	42	28	0.3	4.0	645...	304120 0071	35,70	304125 0071	35,70
R/L050,5-10	5.0	1.9	0.15	4.4	25	10	0.5	5.0	645...	304120 0020	22,40	304125 0020	22,40
R/L050,5-15	5.0	1.9	0.15	4.4	30	15	0.5	5.0	645...	304120 0021	23,90	304125 0021	23,90
R/L050,5-20	5.0	1.9	0.15	4.4	35	20	0.5	5.0	645...	304120 0505	27,60	304125 0505	27,60
R/L050,5-25	5.0	1.9	0.15	4.4	40	25	0.5	5.0	645...	304120 0023	31,30	304125 0023	31,30
R/L050,5-30	5.0	1.9	0.15	4.4	45	30	0.5	5.0	645...	304120 0024	35,10	304125 0024	35,10
R/L050,5-35	5.0	1.9	0.15	4.4	50	35	0.5	5.0	645...	304120 0080	39,10	304125 0080	39,10
R/L050,5-40	5.0	1.9	0.15	4.4	55	40	0.5	5.0	645...	304120 0025	43,60	304125 0025	43,60
R/L050,6-15	6.0	2.3	0.15	5.3	30	15	0.5	6.0	676...	304120 0030	23,90	304125 0030	23,90
R/L050,6-22	6.0	2.3	0.15	5.3	37	22	0.5	6.0	676...	304120 0606	27,60	304125 0606	27,60
R/L050,6-25	6.0	2.3	0.15	5.3	40	25	0.5	6.0	676...	304120 0032	31,30	304125 0032	31,30
R/L050,6-30	6.0	2.3	0.15	5.3	45	30	0.5	6.0	676...	304120 0033	35,10	304125 0033	35,10
R/L050,6-35	6.0	2.3	0.15	5.3	50	35	0.5	6.0	676...	304120 0150	39,10	304125 0150	39,10
R/L050,6-42	6.0	2.3	0.15	5.3	57	42	0.5	6.0	676...	304120 0151	43,60	304125 0151	43,60
R/L050,7-20	7.0	2.8	0.15	6.3	35	20	0.6	6.8	676...	304120 0040	27,80	304125 0040	27,80
R/L050,7-25	7.0	2.8	0.15	6.3	40	25	0.6	6.8	676...	304120 0041	31,70	304125 0041	31,70
R/L050,7-30	7.0	2.8	0.15	6.3	45	30	0.6	6.8	676...	304120 0042	35,70	304125 0042	35,70
R/L050,7-35	7.0	2.8	0.15	6.3	50	35	0.6	6.8	676...	304120 0160	39,70	304125 0160	39,70
R/L050,7-40	7.0	2.8	0.15	6.3	55	40	0.6	6.8	676...	304120 0161	44,30	304125 0161	44,30
R/L050,7-45	7.0	2.8	0.15	6.3	60	45	0.6	6.8	676...	304120 0162	46,90	304125 0162	46,90
R/L050,7-50	7.0	2.8	0.15	6.3	65	50	0.6	6.8	676...	304120 0163	50,60	304125 0163	50,60
R/L050,8-50	8.0	3.3	0.2	7.3	70	50	0.7	7.8	681...	304120 0164	57,-	304125 0164	57,-
R/L050,8-60	8.0	3.3	0.2	7.3	80	60	0.7	7.8	681...	304120 0165	57,-	304125 0165	57,-

3125

3125

L1 to 7 x D

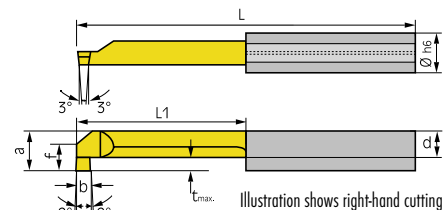
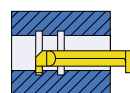


Illustration shows right-hand cutting

- Internal recess turning, coated CN45F
- From bore diameter of 4 mm

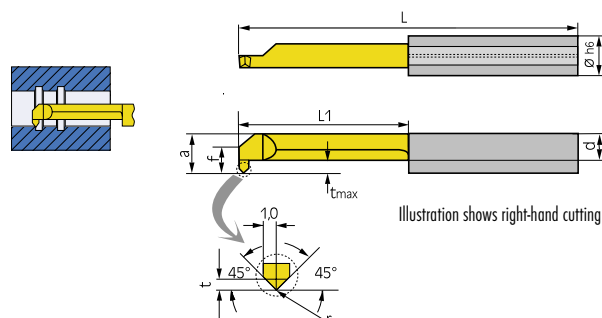
Designation	D h6 mm	b +0.05 mm	f mm	d mm	a mm	L mm	L1 mm	t max. mm	D min. mm	suitable tool holder	ISO		ISO	
											CN45F TiN right-hand art.no.	€	CN45F TiN left-hand art.no.	€
R/L 004,0100-10	4.0	1.0	1.5	2.4	3.5	24	10	0.8	4.0	645...	304210 0001	24,70	304215 0001	24,70
R/L 004,0100-16	4.0	1.0	1.5	2.4	3.5	30	16	0.8	4.0	645...	304210 0404	28,60	304215 0404	28,60
R/L 004,0100-20	4.0	1.0	1.5	2.4	3.5	34	20	0.8	4.0	645...	304210 0003	31,70	304215 0003	31,70
R/L 005,0100-10	5.0	1.0	1.9	3.3	4.4	25	10	1.0	5.0	645...	304210 0010	23,30	304215 0010	23,30
R/L 005,0100-15	5.0	1.0	1.9	3.3	4.4	30	15	1.0	5.0	645...	304210 0011	27,10	304215 0011	27,10
R/L 005,0100-20	5.0	1.0	1.9	3.3	4.4	35	20	1.0	5.0	645...	304210 0505	30,40	304215 0505	30,40
R/L 005,0100-25	5.0	1.0	1.9	3.3	4.4	40	25	1.0	5.0	645...	304210 0013	33,20	304215 0013	33,20
R/L 005,0100-30	5.0	1.0	1.9	3.3	4.4	45	30	1.0	5.0	645...	304210 0014	37,10	304215 0014	37,10
R/L 005,0100-35	5.0	1.0	1.9	3.3	4.4	50	35	1.0	5.0	645...	304210 0015	41,-	304215 0015	41,-
R/L 005,0150-10	5.0	1.5	1.9	3.3	4.4	25	10	1.0	5.0	645...	304210 0020	23,30	304215 0020	23,30
R/L 005,0150-15	5.0	1.5	1.9	3.3	4.4	30	15	1.0	5.0	645...	304210 0021	27,10	304215 0021	27,10
R/L 005,0150-20	5.0	1.5	1.9	3.3	4.4	35	20	1.0	5.0	645...	304210 0515	30,40	304215 0515	30,40
R/L 005,0150-25	5.0	1.5	1.9	3.3	4.4	40	25	1.0	5.0	645...	304210 0023	33,20	304215 0023	33,20
R/L 005,0150-30	5.0	1.5	1.9	3.3	4.4	45	30	1.0	5.0	645...	304210 0024	37,10	304215 0024	37,10
R/L 005,0200-10	5.0	2.0	1.9	3.3	4.4	25	10	1.0	5.0	645...	304210 0030	23,30	304215 0030	23,30
R/L 005,0200-15	5.0	2.0	1.9	3.3	4.4	30	15	1.0	5.0	645...	304210 0031	27,10	304215 0031	27,10
R/L 005,0200-20	5.0	2.0	1.9	3.3	4.4	35	20	1.0	5.0	645...	304210 0525	30,40	304215 0525	30,40
R/L 005,0200-25	5.0	2.0	1.9	3.3	4.4	40	25	1.0	5.0	645...	304210 0033	33,20	304215 0033	33,20
R/L 005,0200-30	5.0	2.0	1.9	3.3	4.4	45	30	1.0	5.0	645...	304210 0034	37,10	304215 0034	37,10
R/L 006,0100-10	6.0	1.0	2.3	3.4	5.3	25	10	1.8	6.0	676...	304210 0040	23,30	304215 0040	23,30
R/L 006,0100-15	6.0	1.0	2.3	3.4	5.3	30	15	1.8	6.0	676...	304210 0041	27,10	304215 0041	27,10
R/L 006,0100-22	6.0	1.0	2.3	3.4	5.3	37	22	1.8	6.0	676...	304210 0606	30,40	304215 0606	30,40
R/L 006,0100-25	6.0	1.0	2.3	3.4	5.3	40	25	1.8	6.0	676...	304210 0043	33,20	304215 0043	33,20
R/L 006,0100-30	6.0	1.0	2.3	3.4	5.3	45	30	1.8	6.0	676...	304210 0044	37,10	304215 0044	37,10
R/L 006,0100-35	6.0	1.0	2.3	3.4	5.3	50	35	1.8	6.0	676...	304210 0045	41,-	304215 0045	41,-
R/L 006,0100-42	6.0	1.0	2.3	3.4	5.3	57	42	1.8	6.0	676...	304210 0046	45,10	304215 0046	45,10
R/L 006,0150-10	6.0	1.5	2.3	3.4	5.3	25	10	1.8	6.0	676...	304210 0050	23,30	304215 0050	23,30
R/L 006,0150-15	6.0	1.5	2.3	3.4	5.3	30	15	1.8	6.0	676...	304210 0051	27,10	304215 0051	27,10
R/L 006,0150-22	6.0	1.5	2.3	3.4	5.3	37	22	1.8	6.0	676...	304210 0616	30,40	304215 0616	30,40
R/L 006,0150-25	6.0	1.5	2.3	3.4	5.3	40	25	1.8	6.0	676...	304210 0053	33,20	304215 0053	33,20
R/L 006,0150-30	6.0	1.5	2.3	3.4	5.3	45	30	1.8	6.0	676...	304210 0054	37,10	304215 0054	37,10
R/L 006,0150-35	6.0	1.5	2.3	3.4	5.3	50	35	1.8	6.0	676...	304210 0055	41,-	304215 0055	41,-
R/L 006,0200-10	6.0	2.0	2.3	3.4	5.3	25	10	1.8	6.0	676...	304210 0060	23,30	304215 0060	23,30
R/L 006,0200-15	6.0	2.0	2.3	3.4	5.3	30	15	1.8	6.0	676...	304210 0061	27,10	304215 0061	27,10
R/L 006,0200-22	6.0	2.0	2.3	3.4	5.3	37	22	1.8	6.0	676...	304210 0626	30,40	304215 0626	30,40
R/L 006,0200-25	6.0	2.0	2.3	3.4	5.3	40	25	1.8	6.0	676...	304210 0063	33,20	304215 0063	33,20
R/L 006,0200-30	6.0	2.0	2.3	3.4	5.3	45	30	1.8	6.0	676...	304210 0064	37,10	304215 0064	37,10
R/L 007,0100-10	7.0	1.0	2.8	3.7	6.3	25	10	2.5	6.8	676...	304210 0070	23,30	304215 0070	23,30
R/L 007,0100-15	7.0	1.0	2.8	3.7	6.3	30	15	2.5	6.8	676...	304210 0071	27,10	304215 0071	27,10
R/L 007,0100-22	7.0	1.0	2.8	3.7	6.3	37	22	2.5	6.8	676...	304210 0072	30,40	304215 0072	30,40
R/L 007,0100-25	7.0	1.0	2.8	3.7	6.3	40	25	2.5	6.8	676...	304210 0073	33,20	304215 0073	33,20
R/L 007,0100-30	7.0	1.0	2.8	3.7	6.3	45	30	2.5	6.8	676...	304210 0074	37,30	304215 0074	37,30
R/L 007,0100-35	7.0	1.0	2.8	3.7	6.3	50	35	2.5	7.0	676...	304210 0075	41,40	304215 0075	41,40
R/L 007,0100-40	7.0	1.0	2.8	3.7	6.3	55	40	2.5	7.0	676...	304210 0076	45,90	304215 0076	45,90
R/L 007,0100-45	7.0	1.0	2.8	3.7	6.3	60	45	2.5	7.0	676...	304210 0077	49,90	304215 0077	49,90
R/L 007,0100-50	7.0	1.0	2.8	3.7	6.3	65	50	2.5	7.0	676...	304210 0078	53,40	304215 0078	53,40
R/L 007,0150-10	7.0	1.5	2.8	3.7	6.3	25	10	2.5	6.8	676...	304210 0080	23,30	304215 0080	23,30
R/L 007,0150-15	7.0	1.5	2.8	3.7	6.3	30	15	2.5	6.8	676...	304210 0081	27,10	304215 0081	27,10
R/L 007,0150-22	7.0	1.5	2.8	3.7	6.3	37	22	2.5	6.8	676...	304210 0082	30,40	304215 0082	30,40
R/L 007,0150-25	7.0	1.5	2.8	3.7	6.3	40	25	2.5	6.8	676...	304210 0083	33,20	304215 0083	33,20
R/L 007,0150-30	7.0	1.5	2.8	3.7	6.3	45	30	2.5	6.8	676...	304210 0084	37,30	304215 0084	37,30
R/L 007,0150-35	7.0	1.5	2.8	3.7	6.3	50	35	2.5	7.0	676...	304210 0085	41,40	304215 0085	41,40
R/L 007,0150-40	7.0	1.5	2.8	3.7	6.3	55	40	2.5	7.0	676...	304210 0086	45,90	304215 0086	45,90

3125

3125

Continued on next page >>>

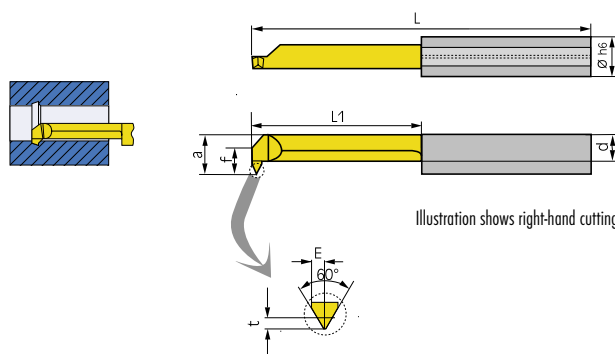
Designation	D h6 mm	b +0.05 mm	f mm	d mm	a mm	L mm	L1 mm	t max. mm	D min. mm	suitable tool holder	ISO P M K			
											CN45F TiN right-hand art.no.	€	CN45F TiN left-hand art.no.	€
R/L 007,0200-10	7.0	2.0	2.8	3.7	6.3	25	10	2.5	6.8	676...	304210 0090	23,30	304215 0090	23,30
R/L 007,0200-15	7.0	2.0	2.8	3.7	6.3	30	15	2.5	6.8	676...	304210 0091	27,10	304215 0091	27,10
R/L 007,0200-22	7.0	2.0	2.8	3.7	6.3	37	22	2.5	6.8	676...	304210 0092	30,40	304215 0092	30,40
R/L 007,0200-25	7.0	2.0	2.8	3.7	6.3	40	25	2.5	6.8	676...	304210 0093	33,20	304215 0093	33,20
R/L 007,0200-30	7.0	2.0	2.8	3.7	6.3	45	30	2.5	6.8	676...	304210 0094	37,30	304215 0094	37,30
R/L 007,0200-35	7.0	2.0	2.8	3.7	6.3	50	35	2.5	7.0	676...	304210 0095	41,40	304215 0095	41,40
											3125		3125	



**Internal turning and chamfering**

- From 5 mm bore diameter
- With internal coolant supply

Designation	D h6 mm	r mm	f mm	d mm	a mm	L mm	L1 mm	t max. mm	D min. mm	suitable tool holder	ISO P M K			
											CN45F TiN right-hand art.no.	€	CN45F TiN left-hand art.no.	€
R/L 060,5-15	5.0	0.2	1.9	3.3	4.4	30	15	0.7	5.0	645...	304310 0001	24,70	304315 0001	24,70
R/L 060,5-20	5.0	0.2	1.9	3.3	4.4	35	20	0.7	5.0	645...	304310 0505	25,40	304315 0505	25,40
R/L 060,7-20	7.0	0.2	2.8	3.7	6.3	35	20	0.7	6.8	676...	304310 0010	28,80	304315 0010	28,80
											3125		3125	



**Internal thread turning**

- **Metric ISO threads** from 4.8 mm bore diameter
- Partial profile, for pitches from 1.0 to 1.5 mm

Designation	P mm	t mm	E mm	f mm	a mm	d mm	L mm	L1 mm	D min. mm	suitable tool holder	ISO P M K			
											CN45F TiN right-hand art.no.	€	CN45F TiN left-hand art.no.	€
R/L 005,0510-15	1.0	0.55	0.55	1.9	4.4	3.3	30	15	4.8	645...	304501 0001	28,20	304505 0001	28,20
R/L 005,0510-20	1.0	0.55	0.55	1.9	4.4	3.3	35	20	4.8	645...	304501 1005	29,-	304505 1005	29,-
R/L 006,0612-15	1.25	0.68	0.65	2.3	5.3	3.4	30	15	6.0	676...	304501 0010	28,20	304505 0010	28,20
R/L 006,0612-22	1.25	0.68	0.65	2.3	5.3	3.4	37	22	6.0	676...	304501 1256	29,-	304505 1256	29,-
R/L 006,0815-15	1.5	0.81	0.75	2.3	5.3	3.4	30	15	6.0	676...	304501 0012	28,20	304505 0012	29,40
R/L 006,0815-22	1.5	0.81	0.75	2.3	5.3	3.4	37	22	6.0	676...	304501 1506	29,-	304505 1506	29,-
R/L 007,0815-15	1.5	0.81	0.75	2.7	6.3	3.8	30	15	7.0	676...	304501 0020	28,20	304505 0020	28,20
											3125		3125	

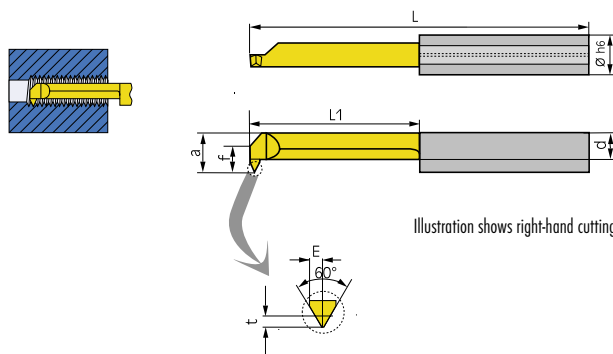


Illustration shows right-hand cutting

**Internal fine-pitch thread turning**

- ISO fine-pitch metric thread from 4 mm bore diameter
- Partial profile, for pitches from 0.5 to 1.0 mm

Designation	P mm	t mm	E mm	f mm	a mm	d mm	L mm	L1 mm	D min. mm	suitable tool holder	ISO P M K			
											CN45F TiN right-hand art.no.	€	CN45F TiN left-hand art.no.	€
R/L 004,0205-15	0.5	0.27	0.35	1.5	3.5	2.4	30	15	4.0	645...	304510 0504	29,60	304515 0504	29,60
R/L 005,0205-15	0.5	0.27	0.35	1.9	4.4	3.3	30	15	5.0	645...	304510 0003	28,20	304515 0003	28,20
R/L 005,0205-20	0.5	0.27	0.35	1.9	4.4	3.3	35	20	5.0	645...	304510 0505	29,-	304515 0505	29,-
R/L 005,0407-15	0.75	0.4	0.45	1.9	4.4	3.3	30	15	5.0	645...	304510 0005	28,20	304515 0005	28,20
R/L 005,0407-20	0.75	0.4	0.45	1.9	4.4	3.3	35	20	5.0	645...	304510 0755	29,-	304515 0755	29,-
R/L 006,0510-15	1.0	0.55	0.55	2.3	5.3	3.4	30	15	6.0	676...	304510 0010	28,20	304515 0010	28,20
R/L 006,0510-22	1.0	0.55	0.55	2.3	5.3	3.4	37	22	6.0	676...	304510 1006	29,-	304515 1006	29,-
											3125		3125	

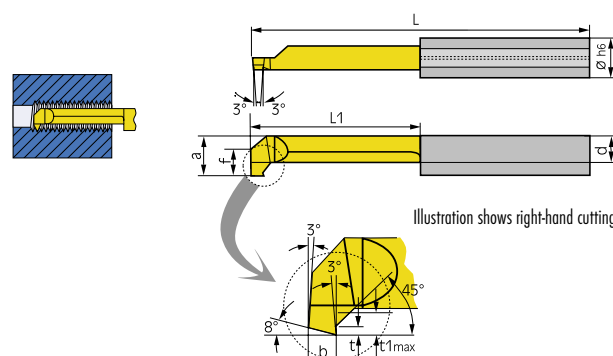


Illustration shows right-hand cutting

**Internal roughing and chamfering for subsequent parting-off**

- From 5 mm bore diameter

Designation	D h6 mm	b mm	f mm	a mm	L mm	L1 mm	t1 max. mm	D min. mm	suitable tool holder	ISO P M K				
										CN45F TiN right-hand art.no.	€	CN45F TiN left-hand art.no.	€	
R/L 070,4-10	4.0	1.0	1.5	3.5	25	10	0.8	4.0	645...	304410 0002	24,20	304415 0002	24,20	
R/L 070,4-16	4.0	1.0	1.5	3.5	30	16	0.8	4.0	645...	304410 0003	24,80	304415 0003	24,80	
R/L 070,5-15	5.0	1.0	1.9	4.4	30	15	1.0	5.0	645...	304410 0001	24,80	304415 0001	24,80	
R/L 070,5-20	5.0	1.0	1.9	4.4	35	20	1.0	5.0	645...	304410 0505	27,30	304415 0505	27,30	
R/L 070,5-30	5.0	1.0	1.9	4.4	45	30	1.0	5.0	645...	304410 0004	33,60	304415 0004	33,60	
R/L 070,6-30	6.0	1.0	2.3	5.3	45	30	1.0	6.0	676...	304410 0005	33,60	304415 0005	33,60	
R/L 070,6-42	6.0	1.0	2.3	5.3	57	42	1.0	6.0	676...	304410 0006	39,30	304415 0006	39,30	
											3125		3125	

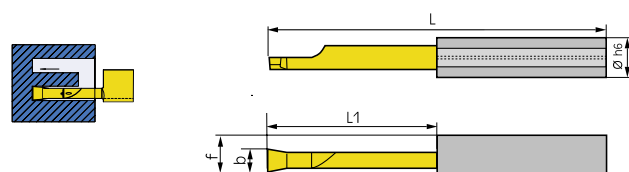


Illustration shows right-hand cutting

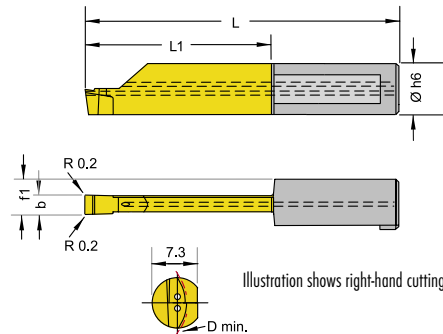
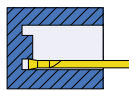
**Axial grooving from 15 mm groove outer diameter**

- Max. groove depth t max. up to 30 mm

Designation	D h6 mm	b +0.05 mm	f mm	L1 mm	L mm	t max. mm	D min. mm	suitable tool holder	ISO P M K					
									CN45F TiN right-hand art.no.	€	CN45F TiN left-hand art.no.	€		
R/L015,1515-10	7.0	1.5	5.9	10	26	10	8.0	676...	304420 1515	38,90	304421 1515	38,90		
R/L015,2015-15	7.0	2.0	5.9	15	30	15	8.0	676...	304420 2015	38,90	304421 2015	38,90		
R/L015,2015-20	7.0	2.0	5.9	20	35	20	8.0	676...	304420 2020	39,30	304421 2020	39,30		
R/L015,2515-20	7.0	2.5	5.9	20	35	20	8.0	676...	304420 2520	39,30	304421 2520	39,30		
R/L015,3015-20	7.0	3.0	5.9	20	35	20	8.0	676...	304420 3020	39,30	304421 3020	39,30		
R/L015,3015-30	7.0	3.0	5.9	30	45	30	8.0	676...	304420 3030	43,30	304421 3030	43,30		
											3125		3125	

Continued on next page >>>

Suitable for high pressure cooling up to 100 bar



**Axial grooving with double coolant bore**

- From Dmin. Ø 16 mm
- Groove depth tmax. up to 40 mm

Designation	D h6 mm	b +0.05 mm	f mm	L1 mm	L mm	t max. mm	D min. mm	suitable tool holder	ISO P M K		ISO P M K	
									AL41F TiAlN right-hand art.no.	€	AL41F TiAlN left-hand art.no.	€
R/L012,0200-10	8	2.0	5.0	10	30	10	12	687...	304450 0210	47,80	304455 0210	47,80
R/L012,0200-15	8	2.0	5.0	15	35	15	12	687...	304450 0215	48,50	304455 0215	48,50
R/L012,0250-10	8	2.5	5.0	10	30	10	12	687...	304400 2510	47,80	304455 2510	47,80
R/L012,0250-20	8	2.5	5.0	20	40	20	12	687...	304400 2520	49,10	304455 2520	49,10
R/L016,0300-10	8	3.0	5.5	10	30	10	16	687...	304450 0310	47,80	304455 0310	47,80
R/L016,0300-20	8	3.0	5.5	20	40	20	16	687...	304450 0320	49,10	304455 0320	49,10
R/L016,0400-10	8	4.0	6.0	10	30	10	16	687...	304450 0410	47,80	304455 0410	47,80
R/L016,0400-20	8	4.0	6.0	20	40	20	16	687...	304450 0420	49,10	304455 0420	49,10
R/L020,0300-25	8	3.0	5.5	25	45	25	20	687...	304450 0325	49,70	304455 0325	49,70
R/L020,0300-30	8	3.0	5.5	30	50	30	20	687...	304450 0330	49,70	304455 0330	49,70
R/L020,0300-35	8	3.0	5.5	35	55	35	20	687...	304450 0335	50,90	304455 0335	50,90
R/L020,0300-40	8	3.0	5.5	40	60	40	20	687...	304450 0340	50,90	304455 0340	50,90
R/L020,0400-25	8	4.0	6.0	25	45	25	20	687...	304450 0425	49,70	304455 0425	49,70
R/L020,0400-30	8	4.0	6.0	30	50	30	20	687...	304450 0430	49,70	304455 0430	49,70
R/L020,0400-35	8	4.0	6.0	35	55	35	20	687...	304450 0435	50,90	304455 0435	50,90
R/L020,0400-40	8	4.0	6.0	40	60	40	20	687...	304450 0440	50,90	304455 0440	50,90
R/L020,0500-20	8	5.0	6.5	20	40	20	20	687...	304450 0520	47,80	304455 0520	47,80
R/L020,0500-25	8	5.0	6.5	25	45	25	20	687...	304450 0525	48,50	304455 0525	48,50
R/L020,0500-30	8	5.0	6.5	30	50	30	20	687...	304450 0530	48,50	304455 0530	48,50
R/L020,0500-35	8	5.0	6.5	35	55	35	20	687...	304450 0535	49,70	304455 0535	49,70
R/L020,0500-40	8	5.0	6.5	40	60	40	20	687...	304450 0540	49,70	304455 0540	49,70
									3125		3125	



... optimal chip control.

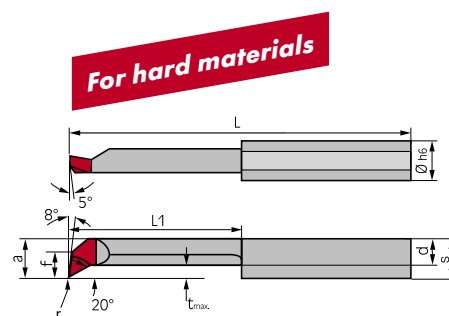
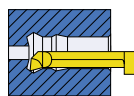
Ground sharp ...

**ATORN**<sup>®</sup>  
Performance demands quality


**Dümmel®** Cutting inserts mini-bore hardline  
WERKZEUGFABRIK


1096

- Bore machining from  $\varnothing$  2 mm
- Internal turning and copying
- Straight shank and lateral clamping surface
- Right-hand and left-hand versions (other left-hand versions available on request)
- **Material: X2CA superfine grain carbide TiAlN+C**
- **Can be used up to HRC 66**
- **best service life results only when coolant emulsions are used**
- **Advantages over CBN:**
  - No problems in machining thin-walled parts
  - Few temperature changes inside the workpiece
  - Can also be used in HRC 48 - 53 range without difficulty
  - Feed 100 % reproducible for the workpiece
  - Considerable reduction in tooling and adjustment costs

**Internal turning**

- From 2 mm bore diameter

Model	r mm	s mm	f mm	d mm	a mm	L mm	L1 mm	f max. mm	D min. mm	D h6 mm	for holder	ISO $\square$		ISO $\square$	
												X2CA right-hand art.no.	€	X2CA left-hand art.no.	€
R/L 050,2-5	0.05	3.5		1.5	1.7	19	5	0.1	2.0	4.0	645...	<b>304550 0001</b>	<b>33,50</b>		
R/L 050,2-10	0.05	3.5		1.5	1.7	24	10	0.1	2.0	4.0	645...	304550 0002	<b>34,10</b>	<b>304555 0002</b>	<b>34,10</b>
R/L 050,3-10	0.1	3.5	0.6	2.3	2.6	24	10	0.2	2.8	4.0	645...	304550 0004	<b>33,40</b>		
R/L 050,3-16	0.1	3.5	0.6	2.3	2.6	30	16	0.2	2.8	4.0	645...	304550 0005	<b>34,70</b>	304555 0005	<b>33,40</b>
R/L 050,4-10	0.1	3.5	1.5	3.0	3.5	24	10	0.3	4.0	4.0	645...	304550 0007	<b>33,40</b>		
R/L 050,4-16	0.1	3.5	1.5	3.0	3.5	30	16	0.3	4.0	4.0	645...	304550 0008	<b>34,70</b>	304555 0008	<b>34,70</b>
R/L 050,4-20	0.1	3.5	1.5	3.0	3.5	34	20	0.3	4.0	4.0	645...	304550 0009	<b>38,40</b>		
R/L 050,5-10	0.15	4.4	1.9	3.8	4.4	25	10	0.5	5.0	5.0	645...	304550 0012	<b>32,40</b>		
R/L 050,5-15	0.15	4.4	1.9	3.8	4.4	30	15	0.5	5.0	5.0	645...	304550 0013	<b>33,90</b>	304555 0013	<b>33,90</b>
R/L 050,5-20	0.15	4.4	1.9	3.8	4.4	35	20	0.5	5.0	5.0	645...	304550 0014	<b>37,50</b>		
R/L 050,5-25	0.15	4.4	1.9	3.8	4.4	40	25	0.5	5.0	5.0	645...	304550 0015	<b>41,20</b>		
R/L 050,6-15	0.15	5.3	2.3	4.5	5.3	30	15	0.5	6.0	6.0	676...	304550 0018	<b>34,40</b>		
R/L 050,6-22	0.15	5.3	2.3	4.5	5.3	37	22	0.5	6.0	6.0	676...	304550 0019	<b>38,10</b>	304555 0019	<b>38,10</b>
R/L 050,6-25	0.15	5.3	2.3	4.5	5.3	40	25	0.5	6.0	6.0	676...	304550 0020	<b>41,70</b>		
R/L 050,6-30	0.15	5.3	2.3	4.5	5.3	45	30	0.5	6.0	6.0	676...	304550 0021	<b>45,60</b>		
R/L 050,7-20	0.15	6.3	2.8	5.5	6.3	35	20	0.6	6.8	7.0	676...	304550 0024	<b>38,50</b>		
R/L 050,7-25	0.15	6.3	2.8	5.5	6.3	40	25	0.6	6.8	7.0	676... 687...	304550 0025	<b>42,40</b>		
R/L 050,7-30	0.15	6.3	2.8	5.5	6.3	45	30	0.6	6.8	7.0	676... 687...	304550 0026	<b>46,50</b>	304555 0026	<b>46,50</b>
R/L 050,7-35	0.15	6.3	2.8	5.5	6.3	50	35	0.6	6.8	7.0	676... 687...	304550 0027	<b>50,40</b>		
R/L 050,7-40	0.15	6.3	2.8	5.5	6.3	55	40	0.6	6.8	7.0	676... 687...	304550 0028	<b>55,-</b>		

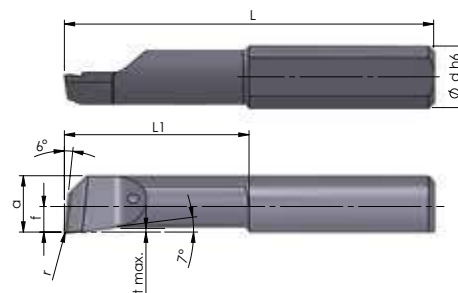
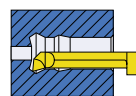
3125

3125

## Cutting inserts mini-bore Xtraline



- Bore machining from  $\varnothing$  1 mm
- Internal turning and copying
- Straight shank and lateral clamping surface
- Right-hand and left-hand versions
- Extra stable design
- Cutting edge with chip former



## Internal turning

- From 1 mm bore diameter

Designation	r mm	f mm	a mm	L mm	L1 mm	t max. mm	D min. mm	D h6 mm	for holder	ISO P M K			
										P18C right-hand art.no.	€	P18C left-hand art.no.	€
R/LX050,1-5R05	0.05	0.45	0.9	20	5	0.03	1.0	4.0	645...	304562 0001	31,40	304563 0001	31,40
R/LX050,15-7R10	0.1	0.65	1.35	21	7	0.05	1.5	4.0	645...	304562 0002	35,80	304563 0002	35,80
R/LX050,2-5R15	0.15	0.9	1.8	19	5	0.1	2.0	4.0	645...	304562 0003	27,40	304563 0003	27,40
R/LX050,2-10R05	0.05	0.9	1.8	24	10	0.1	2.0	4.0	645...	304562 0004	28,10	304563 0004	28,10
R/LX050,2-10R15	0.15	0.9	1.8	24	10	0.1	2.0	4.0	645...	304562 0005	28,10	304563 0005	28,10
R/LX050,3-10R05	0.05	0.7	2.7	24	10	0.15	3.0	4.0	645...	304562 0006	27,20	304563 0006	27,20
R/LX050,3-10R20	0.2	0.7	2.7	24	10	0.15	3.0	4.0	645...	304562 0007	27,20	304563 0007	27,20
R/LX050,3-16R05	0.05	0.7	2.7	30	16	0.15	3.0	4.0	645...	304562 0008	28,80	304563 0008	28,80
R/LX050,3-16R10	0.1	0.7	2.7	30	16	0.15	3.0	4.0	645...	304562 0009	28,80	304563 0009	28,80
R/LX050,3-16R20	0.2	0.7	2.7	30	16	0.15	3.0	4.0	645...	304562 0010	28,80	304563 0010	28,80
R/LX050,4-10R10	0.1	1.6	3.6	24	10	0.2	4.0	4.0	645...	304562 0011	27,20	304563 0011	27,20
R/LX050,4-10R20	0.2	1.6	3.6	24	10	0.2	4.0	4.0	645...	304562 0012	27,20	304563 0012	27,20
R/LX050,4-16R05	0.05	1.6	3.6	30	16	0.2	4.0	4.0	645...	304562 0013	28,80	304563 0013	28,80
R/LX050,4-16R10	0.1	1.6	3.6	30	16	0.2	4.0	4.0	645...	304562 0014	28,80	304563 0014	28,80
R/LX050,4-16R20	0.2	1.6	3.6	30	16	0.2	4.0	4.0	645...	304562 0015	28,80	304563 0015	28,80
R/LX050,4-16R40	0.4	1.6	3.6	30	16	0.2	4.0	4.0	645...	304562 0016	32,10	304563 0016	32,10
R/LX050,4-24R10	0.1	1.6	3.6	38	24	0.2	4.0	4.0	645...	304562 0017	36,60	304563 0017	36,60
R/LX050,4-24R20	0.2	1.6	3.6	38	24	0.2	4.0	4.0	645...	304562 0018	36,60	304563 0018	36,60
R/LX050,4-24R40	0.4	1.6	3.6	38	24	0.2	4.0	4.0	645...	304562 0019	39,80	304563 0019	39,80
R/LX050,5-15R05	0.05	2.1	4.6	30	15	0.3	5.0	5.0	645...	304562 0020	27,20	304563 0020	27,20
R/LX050,5-15R10	0.1	2.1	4.6	30	15	0.3	5.0	5.0	645...	304562 0021	27,20	304563 0021	27,20
R/LX050,5-15R20	0.2	2.1	4.6	30	15	0.3	5.0	5.0	645...	304562 0022	27,20	304563 0022	27,20
R/LX050,5-15R40	0.4	2.1	4.6	30	15	0.3	5.0	5.0	645...	304562 0023	30,50	304563 0023	30,50
R/LX050,5-25R10	0.1	2.1	4.6	40	25	0.3	5.0	5.0	645...	304562 0024	35,40	304563 0024	35,40
R/LX050,5-25R20	0.2	2.1	4.6	40	25	0.3	5.0	5.0	645...	304562 0025	35,40	304563 0025	35,40
R/LX050,5-30R10	0.1	2.1	4.6	45	30	0.3	5.0	5.0	645...	304562 0026	40,-	304563 0026	40,-
R/LX050,5-30R20	0.2	2.1	4.6	45	30	0.3	5.0	5.0	645...	304562 0027	40,-	304563 0027	40,-
R/LX050,5-30R40	0.4	2.1	4.6	45	30	0.3	5.0	5.0	645...	304562 0028	43,30	304563 0028	43,30
R/LX050,6-15R05	0.05	2.5	5.5	30	15	0.4	6.0	6.0	676...	304562 0029	27,20	304563 0029	27,20
R/LX050,6-15R10	0.1	2.5	5.5	30	15	0.4	6.0	6.0	676...	304562 0030	27,20	304563 0030	27,20
R/LX050,6-15R20	0.2	2.5	5.5	30	15	0.4	6.0	6.0	676...	304562 0031	27,20	304563 0031	27,20
R/LX050,6-15R40	0.4	2.5	5.5	30	15	0.4	6.0	6.0	676...	304562 0032	30,50	304563 0032	30,50
R/LX050,6-22R20	0.2	2.5	5.5	37	22	0.4	6.0	6.0	676...	304562 0033	31,30	304563 0033	31,30
R/LX050,6-30R20	0.2	2.5	5.5	45	30	0.4	6.0	6.0	676...	304562 0034	40,-	304563 0034	40,-
R/LX050,6-30R40	0.4	2.5	5.5	45	30	0.4	6.0	6.0	676...	304562 0035	43,30	304563 0035	43,30
R/LX050,6-35R20	0.2	2.5	5.5	50	35	0.4	6.0	6.0	676...	304562 0036	44,30	304563 0036	44,30
R/LX050,6-42R20	0.2	2.5	5.5	57	42	0.4	6.0	6.0	676...	304562 0037	49,50	304563 0037	49,50
R/LX050,6-50R20	0.2	2.5	5.5	65	50	0.4	6.0	6.0	676...	304562 0038	55,-	304563 0038	55,-
R/LX050,7-25R20	0.2	3	6.5	40	25	0.5	7.0	7.0	676...	304562 0039	36,10	304563 0039	36,10
R/LX050,7-30R20	0.2	3	6.5	45	30	0.5	7.0	7.0	676...	304562 0040	40,60	304563 0040	40,60
R/LX050,7-30R40	0.4	3	6.5	45	30	0.5	7.0	7.0	676...	304562 0041	43,90	304563 0041	43,90
R/LX050,7-35R20	0.2	3	6.5	50	35	0.5	7.0	7.0	676...	304562 0042	45,-	304563 0042	45,-
R/LX050,7-40R20	0.2	3	6.5	55	40	0.5	7.0	7.0	676...	304562 0043	50,20	304563 0043	50,20
R/LX050,7-45R20	0.2	3	6.5	60	45	0.5	7.0	7.0	676...	304562 0044	53,40	304563 0044	53,40
R/LX050,7-50R20	0.2	3	6.5	65	50	0.5	7.0	7.0	676...	304562 0045	57,50	304563 0045	57,50

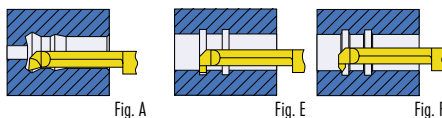
3125

3125




**mini-børe cutting tool set 1**
**• Internal turning, recess turning and chamfering**

- Complete set including holder
- Internal machining from 3 mm bore Ø
- Design: **right-hand cutting**
- Cutting inserts: **CN45F, TiN-coated**
- Supplied in a case

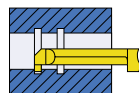


Designation	Bore hole Ø mm	Bore depth mm	Punching depth mm	Punching width mm	Illustration	art.no.	€
676,0016-D							
645,0016-D							
111,645							
R 050,6-22	6	22	-	-	A	<b>304601 0001</b>	<b>450,-</b>
R 050,5-20	5	20	-	-	A		
R 060,5-20	5	20	-	-	F		
R 050,4-16	4	16	-	-	A		
R 050,3-16	3	16	-	-	A		
R 006,0200-22	6	22	1.8	2.0	E		
R 006,0150-22	6	22	1.8	1.5	E		
R 005,0200-20	5	20	1.0	2.0	E		
R 005,0150-20	5	20	1.0	1.5	E		
R 004,0100-16	4	16	0.8	1.0	E		

3125


**mini-børe cutting tool set 2**
**• Internal recess turning**

- Complete set including holder
- Internal machining from 4 mm bore Ø
- Design: **right-hand cutting**
- Cutting inserts: **CN45F, TiN-coated**
- Supplied in a case

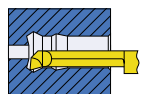


Designation	Bore hole Ø mm	Bore depth mm	Punching depth mm	Punching width mm	Illustration	art.no.	€
676,0016-D							
645,0016-D							
111,645							
R 006,0200-22	6	22	1.8	2.0	E	<b>304601 0002</b>	<b>270,-</b>
R 006,0150-22	6	22	1.8	1.5	E		
R 005,0200-20	5	20	1.0	2.0	E		
R 005,0150-20	5	20	1.0	1.5	E		
R 004,0100-16	4	16	0.8	1.0	E		

3125


**mini-børe cutting tool set 3**
**• Internal turning**

- Complete set including holder
- Internal machining from 3 mm bore Ø
- Design: **right-hand cutting**
- Cutting inserts: **CN45F, TiN-coated**
- Supplied in a case



Designation	Bore hole Ø mm	Bore depth mm	Punching depth mm	Punching width mm	Illustration	art.no.	€
676,0016-D							
645,0016-D							
111,645							
R 050,6-22	6	22	-	-	A	<b>304601 0003</b>	<b>305,-</b>
R 050,5-20	5	20	-	-	A		
R 050,4-16	4	16	-	-	A		
R 050,3-16	3	16	-	-	A		

3125



## Dümmel® Clamp mounting DT-Line

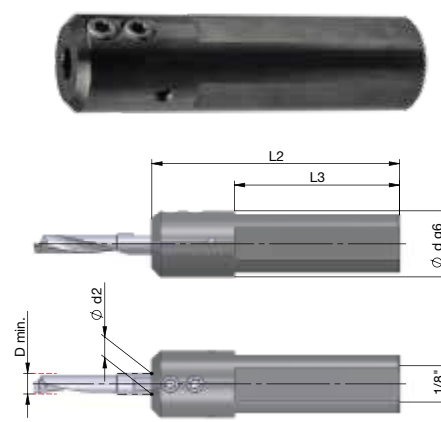
NEW

- Multi-function tool for drilling and turning
- Clamp mounting with 4 clamping surfaces, 90° offset
- internal coolant supply
- drilling depths up to 4 x D
- bore machining from D<sub>min.</sub> 2.9mm
- cutting edge with internal coolant bore
- AL41F high-performance coating
- large clamping depths possible when turning and solid drilling

Designation	suitable cutting inserts	d g6 mm	L2 mm	L3 mm	art.no.	€
640.DT16	DT.4	16.0	60	40	304002 0001	122,50
640.DT20	DT.4	20.0	60	40	304002 0002	127,50
650.DT16	DT.5	16.0	60	40	304002 0003	122,50
650.DT20	DT.5	20.0	60	40	304002 0004	127,50
660.DT16	DT.6	16.0	60	40	304002 0005	122,50
660.DT20	DT.6	20.0	60	40	304002 0006	127,50
670.DT16	DT.7	16.0	60	40	304002 0007	122,50
670.DT20	DT.7	20.0	60	40	304002 0008	127,50
680.DT16	DT.8	16.0	60	40	304002 0009	122,50
680.DT20	DT.8	20.0	60	40	304002 0010	127,50

3125

Multifunction tool for drilling  
and turning



## Dümmel® Cutting inserts DT-Line

NEW

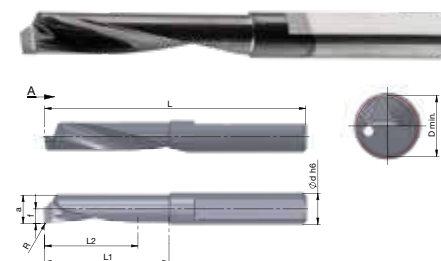


- Internal coolant supply
- Clamping surface from above
- right-hand and left-hand versions
- Cutting material: AL41F micro-grain carbide TiAlN

From Ø 2.9mm

### Drilling and internal turning

- from boring diameter 2.9mm
- Coated cutting inserts AL41F
- L1 maximum turning depth
- L2 maximum boring depth



Designation	D h6 mm	f mm	r mm	a mm	L mm	L1 mm	L2 mm	D min. mm	suitable tool holder	ISO P M K			
										AL41F right-hand art.no.	€	AL41F left-hand art.no.	€
R/LDT.3-10	4.0	0.9	0.2	2.72	37	10	10	2.9	640.DT..	304564 0001	64,10	304565 0001	64,10
R/LDT.3-13	4.0	0.9	0.2	2.72	40	13	13	2.9	640.DT..	304564 0002	65,60	304565 0002	65,60
R/LDT.4-15	4.0	1.85	0.2	3.55	37	15	10	3.7	640.DT..	304564 0003	64,60	304565 0003	64,60
R/LDT.4-20	4.0	1.85	0.2	3.55	42	20	16	3.7	640.DT..	304564 0004	68,20	304565 0004	68,20
R/LDT.5-15	5.0	2.35	0.2	4.55	37	15	10	4.7	650.DT..	304564 0005	66,20	304565 0005	66,20
R/LDT.5-20	5.0	2.35	0.2	4.55	42	20	15	4.7	650.DT..	304564 0006	67,70	304565 0006	67,70
R/LDT.5-25	5.0	2.35	0.2	4.55	47	25	20	4.7	650.DT..	304564 0007	69,70	304565 0007	69,70
R/LDT.6-15	6.0	2.85	0.2	5.55	37	15	10	5.7	660.DT..	304564 0008	67,20	304565 0008	67,20
R/LDT.6-20	6.0	2.85	0.2	5.55	42	20	15	5.7	660.DT..	304564 0009	69,20	304565 0009	69,20
R/LDT.6-25	6.0	2.85	0.2	5.55	47	25	20	5.7	660.DT..	304564 0010	71,20	304565 0010	71,20
R/LDT.6-30	6.0	2.85	0.2	5.55	52	30	25	5.7	660.DT..	304564 0011	72,80	304565 0011	72,80
R/LDT.7-20	7.0	3.35	0.2	6.55	42	20	15	6.7	670.DT..	304564 0012	70,70	304565 0012	70,70
R/LDT.7-25	7.0	3.35	0.2	6.55	47	25	20	6.7	670.DT..	304564 0013	72,80	304565 0013	72,80
R/LDT.7-30	7.0	3.35	0.2	6.55	52	30	25	6.7	670.DT..	304564 0014	75,30	304565 0014	75,30
R/LDT.7-35	7.0	3.35	0.2	6.55	57	35	30	6.7	670.DT..	304564 0015	77,30	304565 0015	77,30
R/LDT.8-25	8.0	3.85	0.2	7.55	52	25	20	7.7	680.DT..	304564 0016	72,80	304565 0016	72,80
R/LDT.8-30	8.0	3.85	0.2	7.55	57	30	25	7.7	680.DT..	304564 0017	75,80	304565 0017	75,80
R/LDT.8-35	8.0	3.85	0.2	7.55	62	35	30	7.7	680.DT..	304564 0018	78,90	304565 0018	78,90
R/LDT.8-40	8.0	3.85	0.2	7.55	67	40	35	7.7	680.DT..	304564 0019	81,40	304565 0019	81,40

3125

3125

- **Drilling and internal turning**
- complete set including holder
- **L1 maximum turning depth**
- **L2 maximum drilling depth**
- Version: **right-hand cutting**
- Cutting inserts: **AL41F-TiAlN-coated**
- Supplied in a case

**RDT-4**

- Internal machining from  $\varnothing$  3.7mm

Designation	d g6 mm	L1 mm	L2 mm	D min. mm	art.no.	€
640.DT16 , RDT.4-15 , RDT.4-20	16	15 , 20	10 , 16	3.7	<b>304602</b> 0001	<b>196,50</b>

3125

**RDT-5**

- Internal machining from  $\varnothing$  4.7mm

Designation	d g6 mm	L1 mm	L2 mm	D min. mm	art.no.	€
650.DT16 , RDT.5-15 , RDT.5-25	16	15 , 25	10 , 20	4.7	<b>304602</b> 0002	<b>196,50</b>

3125

**RDT-6**

- Internal machining from  $\varnothing$  5.7mm

Designation	d g6 mm	L1 mm	L2 mm	D min. mm	art.no.	€
660.DT16 , RDT.6-15 , RDT.6-30	16	15 , 30	10 , 25	5.7	<b>304602</b> 0003	<b>196,50</b>

3125

**RDT-7**

- Internal machining from  $\varnothing$  6.7mm

Designation	d g6 mm	L1 mm	L2 mm	D min. mm	art.no.	€
670.DT16 , RDT.7-20 , RDT.7-35	16	20 , 35	15 , 30	6.7	<b>304602</b> 0004	<b>196,50</b>

3125

TOOL  
**WORN-OUT.**  
 THAT WON'T  
**STOP YOU**

**BECAUSE YOU ARE ALWAYS PREPARED:  
 SARA® GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

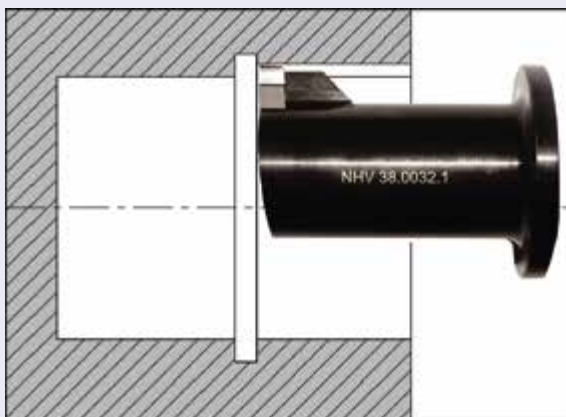
# ATORN® Systematic keyway slotting

INFO

The tool system for keyway slotting offers a cost-effective and simple solution in many areas and can be used on practically any CNC lathe, milling machine or machining centre.

Practically any common groove can be created directly on the lathe. The machining of complex and therefore often valuable workpieces or semi-finished products on a lathe is frequently one of the first work processes. The workpiece is either pre-turned or finished.

Grooves must now be applied longitudinally as a carrier or anti-twist protection. This tool system can now be used to manufacture longitudinal grooves compliant with DIN 138 and DIN 6885 on CNC lathes and reduce costs.



### References

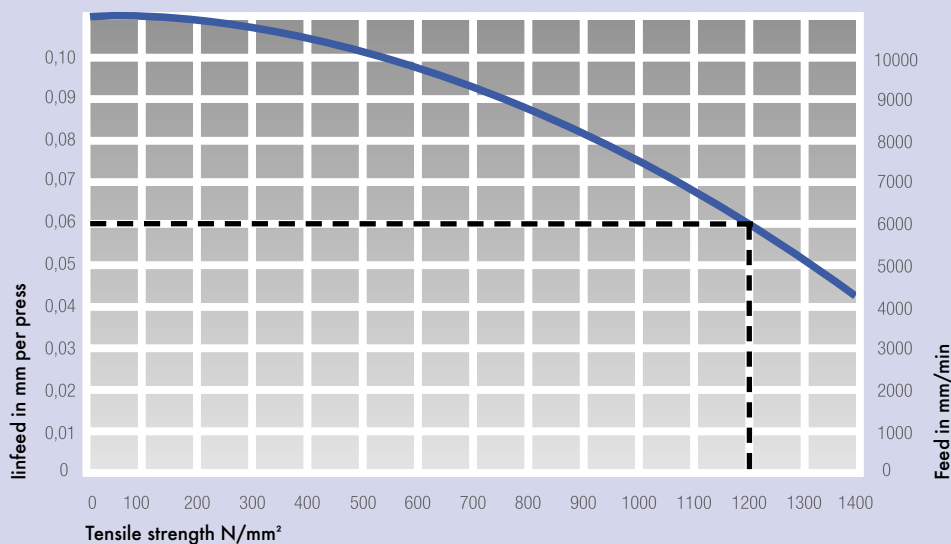
- an undercut is necessary at the end of the broached groove for tool run out.
- the insert should not touch the bottom of the groove as the tool retracts.
- setting of the tool is very important. Check accurate the component diameter before taking the first pass.
- using oil or emulsion helps to achieve better surface finish and flush chips out of the component.
- the tool should be set at the 12 o'clock position to ensure that chips fall away from the groove.
- avoid interrupted cutting

### Approximate value for broaching

**Example:** heat-treated steel for instance 42CrMo4 with 1200 N/mm<sup>2</sup>

- infeed per pass 0,05-0,06 mm

- feed 5500 mm/min



## ATORN® Tool holder for keyway slotting

- Keyway slotting on CNC lathes, milling machines and machining centres
- Keyway slotting of longitudinal grooves in accordance with DIN 138 and DIN 6885

### Type NHU, bore Ø from 6 mm

Model	d g6 mm	d1 mm	d2 mm	L mm	L1 mm	L2 mm	h mm	art.no.	€
NHU.0025,1	25	33	18	73	33	40	23	<b>307001 0025</b>	<b>216,-</b>
NHU.0032,1	32	40	20	73	33	40	30	<b>307001 0032</b>	<b>226,-</b>
3130									

### Type NH10, bore Ø from 10 mm

Model	d g6 mm	d1 mm	d2 mm	L mm	L1 mm	L2 mm	h mm	art.no.	€
NH10,0025,1	25	33	20	73	33	40	23	<b>308001 0025</b>	<b>216,-</b>
NH10,0032,1	32	40	20	73	33	40	30	<b>308001 0032</b>	<b>216,-</b>
3130									

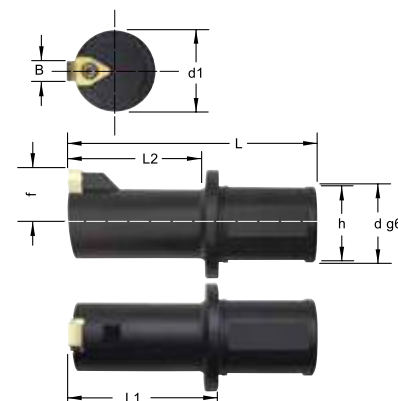
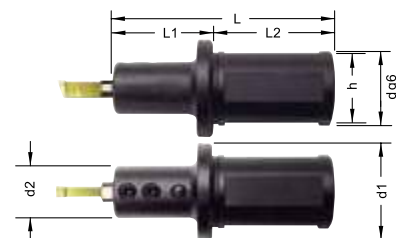
### Type NHV, bore Ø from 22 mm

Model	d g6 mm	d1 mm	f mm	L mm	L1 mm	L2 mm	h mm	D min. mm	art.no.	€
NHV.22,0025,1	25	33	12.0	100	60	50	23	22	<b>309001 0022</b>	<b>203,-</b>
NHV.22,0025,2	25	33	12	125	85	75		22	<b>309001 1022</b>	<b>234,-</b>
NHV.22,0025,3	25	33	12.0	175	115	105		22	<b>309001 2022</b>	<b>290,-</b>
NHV.30,0032,1	32	45	16.5	100	60	50	30	30	<b>309001 0030</b>	<b>203,-</b>
NHV.30,0032,2	32	45	16.5	125	85	75	30	30	<b>309001 1030</b>	<b>231,-</b>
NHV.30,0032,3	32	45	16.5	155	115	105		30	<b>309001 2030</b>	<b>270,-</b>
NHV.30,0032,4	32	45	16.5	220	160	150		30	<b>309001 3030</b>	<b>346,-</b>
NHV.38,0032,1	32	45	22.0	100	60	50	30	30	<b>309001 0038</b>	<b>203,-</b>
NHV.38,0032,2	32	45	22.0	125	85	75	30	38	<b>309001 1038</b>	<b>231,-</b>
NHV.38,0032,4	32	45	22.0	235	175	165		38	<b>309001 2038</b>	<b>375,-</b>
NHV.45,0040,1	40	55	24.0	120	60	50	45	45	<b>309001 0045</b>	<b>285,-</b>
NHV.45,0040,3	40	55	24.0	175	115	105		45	<b>309001 1045</b>	<b>385,-</b>
NHV.45,0040,4	40	55	24.0	225	165	155		45	<b>309001 2045</b>	<b>435,-</b>
NHV.45,0040,5	40	55	24.0	275	215	205		45	<b>309001 3045</b>	<b>529,-</b>
3130										

### Type NHV with internal coolant supply, bore hole Ø from 10mm

NEW

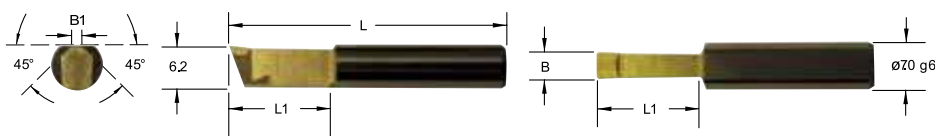
Model	d g6 mm	d1 mm	f mm	L mm	L1 mm	L2 mm	D min. mm	art.no.	€
NHV.10.IK25,1	25	33	4.9	70	30	22	10	<b>309006 0010</b>	<b>203,-</b>
NHV.10.IK25,2	25	33	4.9	80	40	32	10	<b>309006 1010</b>	<b>220,-</b>
NHV.10.IK25,3	25	33	4.9	90	50	42	10	<b>309006 2010</b>	<b>236,-</b>
NHV.15.IK25,1	25	33	8.4	75	35	25	15	<b>309006 0015</b>	<b>192,50</b>
NHV.15.IK25,2	25	33	8.4	90	50	40	15	<b>309006 1015</b>	<b>211,-</b>
NHV.15.IK25,3	25	33	8.4	110	70	60	15	<b>309006 2015</b>	<b>241,-</b>
NHV.15.IK25,4	25	33	8.4	125	85	75	15	<b>309006 3015</b>	<b>294,-</b>
3130									



## ATORN® Cutting inserts for keyway slotting



- Keyway slotting of longitudinal grooves in accordance with DIN 138 and DIN 6885
- Tolerance class C11/JS9/P9
- **Type NPU**, bore Ø from 6 mm
- **Type NP10**, bore Ø from 10 mm
- **Type NPV**, bore Ø from 22 mm
- Cutting material: **HC8620**, **TIALN**-coated

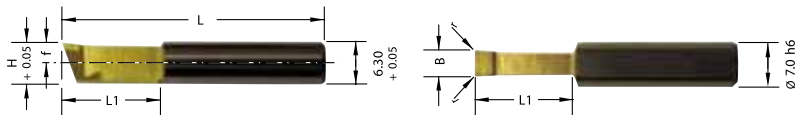


### Type NPU, 45°/chamfered

Model	B1 mm	B mm	L mm	L1 mm	Groove width mm	suitable for holder	art.no.	€
NPU.4545,1	3.6	6.5	50	25	4 / 5	NHU	<b>307005 4545</b>	<b>52,90</b>
3130								

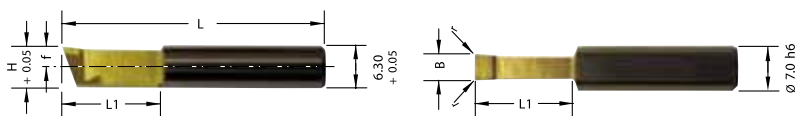
Continued on next page &gt;&gt;&gt;



**Type NPU, standard, DIN 138, tolerance C11**

Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	H mm	r mm	f mm	L mm	L1 mm	D min. mm	suitable for holder	art.no.	€
NPU.0210,03.1	6	2	0.9	C11	2.1	5.5	0.35	2.0	38	12.5	6	NHU	<b>307006</b> 0210	<b>41,20</b>
NPU.0310,03.1	10	3	1.5	C11	3.1	6.2	0.35	2.7	38	12.5	7	NHU	307006 0310	<b>41,20</b>
NPU.0310,05.1	13	3	1.6	C11	3.1	6.2	0.50	2.7	38	12.5	7	NHU	307006 0311	<b>41,20</b>
NPU.0410,05.1	16	4	1.7	C11	4.1	6.2	0.50	2.7	40	15.0	7	NHU	307006 0410	<b>39,70</b>
NPU.0410,05.2	16	4	1.7	C11	4.1	6.2	0.50	2.7	50	25.0	7	NHU	307006 0411	<b>51,90</b>

3130

**Type NPU, loose fit, DIN 6885, tolerance JS9**

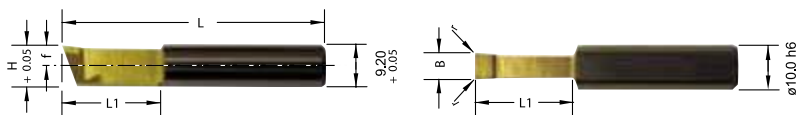
Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	H mm	r mm	f mm	L mm	L1 mm	D min. mm	suitable for holder	art.no.	€
NPU.0200,01.1	> 6-8	2	1.0	JS9	2	5.5	0.1	2.0	38	12.5	6	NHU	<b>307007</b> 0200	<b>41,20</b>
NPU.0300,01.1	> 8-10	3	1.4	JS9	3	6.2	0.1	2.7	38	12.5	7	NHU	307007 0300	<b>41,20</b>
NPU.0400,01.1	> 10-12	4	1.8	JS9	4	6.2	0.1	2.7	40	15.0	7	NHU	307007 0400	<b>39,70</b>
NPU.0400,02.1	> 10-12	4	1.8	JS9	4	6.2	0.2	2.7	40	15.0	7	NHU	307007 0401	<b>39,70</b>
NPU.0400,02.2	> 10-12	4	1.8	JS9	4	6.2	0.2	2.7	50	25.0	7	NHU	307007 0402	<b>51,90</b>
NPU.0500,02.2	> 12-17	5	2.3	JS9	5	5.8	0.2	2.3	50	25.0	7	NHU	307007 0500	<b>51,90</b>

3130

**Type NPU, tight fit, DIN 6885, tolerance P9**

Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	H mm	r mm	f mm	L mm	L1 mm	D min. mm	suitable for holder	art.no.	€
NPU.0198,01.1	> 6 - 8	2	1.0	P9	1.98	5.5	0.1	2.0	38	12.5	6	NHU	<b>307008</b> 0198	<b>41,20</b>
NPU.0298,01.1	> 8 - 10	3	1.4	P9	2.98	6.2	0.1	2.7	38	12.5	7	NHU	307008 0298	<b>41,20</b>
NPU.0398,01.1	> 10 - 12	4	1.8	P9	3.98	6.2	0.1	2.7	40	15.0	7	NHU	307008 0398	<b>39,70</b>
NPU.0398,02.2	> 10 - 12	4	1.8	P9	3.98	6.2	0.2	2.7	50	25.0	7	NHU	307008 1398	<b>51,90</b>
NPU.0498,02.2	> 12 - 17	5	2.3	P9	4.98	5.8	0.2	2.3	50	25.0	7	NHU	307008 0498	<b>51,90</b>

3130

**Type NP10, standard, DIN 138 (\*non-DIN), tolerance C11**

Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	H mm	r mm	f mm	L mm	L1 mm	D min. mm	suitable for holder	art.no.	€
NP10,410.05,2	16	4	1.7	C11	4.1	9	0.5	4	50	25	10	NH10	<b>308002</b> 0410	<b>57,50</b>
NP10,410.05,3	16	4	1.7	C11	4.1	9	0.5	4	66	41	10	NH10	308002 0411	<b>71,70</b>
NP10,510.05,2*	10	-	-	-	5.1	9	0.5	4	50	25	10	NH10	308002 0510	<b>57,50</b>
NP10,510.05,3*	10	-	-	-	5.1	9	0.5	4	66	41	10	NH10	308002 0511	<b>71,70</b>

3130

**Type NP10, loose fit, DIN 6885, tolerance JS9**

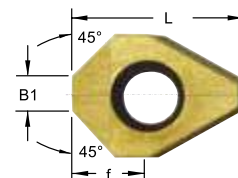
Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	H mm	r mm	f mm	L mm	L1 mm	D min. mm	suitable for holder	art.no.	€
NP10,400.02,2	10	4	1.8	JS9	4	9	0.2	4	50	25	10	NH10	<b>308003</b> 0400	<b>57,50</b>
NP10,400.02,3	10	4	1.8	JS9	4	9	0.2	4	66	41	10	NH10	308003 0401	<b>71,70</b>
NP10,500.02,2	12	5	2.3	JS9	5	9	0.2	4	50	25	10	NH10	308003 0500	<b>57,50</b>
NP10,500.02,3	12	5	2.3	JS9	5	9	0.2	4	66	41	10	NH10	308003 0501	<b>71,70</b>

3130

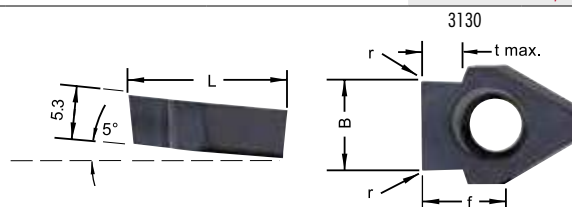
**Type NP10, tight fit, DIN 6885, tolerance P9**

Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	H mm	r mm	f mm	L mm	L1 mm	D min. mm	suitable for holder	art.no.	€
NP10,398.02,2	10	4	1.8	P9	3.98	9	0.2	4	50	25	10	NH10	<b>308004</b> 0398	<b>57,50</b>
NP10,398.02,3	10	4	1.8	P9	3.98	9	0.2	4	66	41	10	NH10	308004 1398	<b>71,70</b>
NP10,498.02,2	12	5	2.3	P9	4.98	9	0.2	4	50	25	10	NH10	308004 0498	<b>57,50</b>
NP10,498.02,3	12	5	2.3	P9	4.98	9	0.2	4	66	41	10	NH10	308004 1498	<b>71,70</b>

3130

**Type NPV, 45°/chamfered**

Model	B1 mm	L mm	B mm	Groove width mm	suitable for holder	art.no.	€
NPV.3045,1	3.5	17.3	8.0	6 / 7 / 8	NHV22	<b>309002</b> 3045	<b>38,20</b>
NPV.6045,1	6.0	20.2	10.9	10	NHV38	309002 6045	<b>35,80</b>

**Type NPV, standard, DIN 138, tolerance C11**

Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	r mm	f mm	L mm	t max. mm	D min. mm	suitable for holder	art.no.	€
NPV.0612,085	22	6	2.1	C11	6.12	0.85	8.0	17.3	2.6	22	NHV22	<b>309003</b> 0626	<b>36,70</b>
NPV.0713,085	27	7	2.8	C11	7.13	0.85	8.0	17.3	3.3	22	NHV22	309003 0733	<b>36,70</b>
NPV.0813,105	32	8	2.8	C11	8.13	1.05	8.0	17.3	3.4	22	NHV22 / NHV30	309003 0834	<b>36,70</b>
NPV.1013,105	40	10	3.5	C11	10.13	1.05	10.9	20.1	4.2	40	NHV38	309003 1042	<b>36,70</b>
NPV.1215,135	50	12	3.6	C11	12.15	1.35	10.9	20.1	5.1	40	NHV38	309003 1251	<b>36,70</b>
NPV.1215,175	70	12	5.0	C11	12.15	1.75	10.9	20.1	6.6	40	NHV38	309003 1666	<b>36,70</b>
NPV.1215,225	100	12	7.0	C11	12.15	2.25	10.9	20.1	8.5	40	NHV38	309003 2485	<b>36,70</b>

**Type NPV, loose fit, DIN 6885, tolerance JS9**

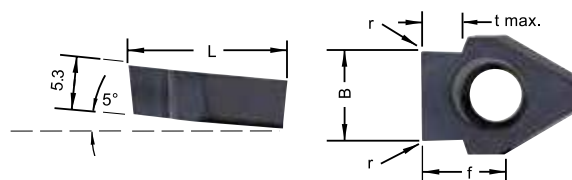
Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	r mm	f mm	L mm	t max. mm	D min. mm	suitable for holder	art.no.	€
NPV.0501,02	22	5	2.3	JS9	5.01	0.2	8.0	17.3	2.7	22	NHV22	<b>309004</b> 0527	<b>36,70</b>
NPV.0601,02	22	6	2.8	JS9	6.01	0.2	8.0	17.3	3.4	22	NHV22	309004 0634	<b>36,70</b>
NPV.0801,02	> 22-30	8	3.3	JS9	8.01	0.2	8.0	17.3	4.1	22	NHV22 / NHV30	309004 0841	<b>36,70</b>
NPV.1001,03	> 30-38	10	3.3	JS9	10.01	0.3	8.0	17.3	4.2	30	NHV30	309004 1042	<b>36,70</b>
NPV.1202,03	> 38-44	12	3.3	JS9	12.02	0.3	10.9	20.1	5.7	40	NHV38	309004 1257	<b>36,70</b>
NPV.1202,05	> 65-75	12	4.9	JS9	12.02	0.5	10.9	20.1	8.5	40	NHV38	309004 2085	<b>36,70</b>
NPV.1402,03		14		JS9	14.02	0.3		20.1	7.5	45	NHV22 - NHV45	309004 1475	<b>42,30</b>
NPV.1602,03		16		JS9	16.02	0.3		20.1	7.5	45	NHV22 - NHV45	309004 1675	<b>42,30</b>
NPV.1802,05		18		JS9	18.02	0.4		20.1	9.5	45	NHV22 - NHV45	309004 1895	<b>42,30</b>
NPV.2002,05		20		JS9	20.02	0.5		20.1	10	45	NHV22 - NHV45	309004 2010	<b>42,30</b>
NV10,0301,02	10	3		JS9	3.01	0.2		8.2	1.8	10	NHV10	309004 0318	<b>37,20</b>
NV10,0401,02	10	4		JS9	4.01	0.2		8.2	2.3	10	NHV10	309004 0423	<b>37,20</b>
NV10,0501,02	10	5		JS9	5.01	0.2		8.2	2.8	10	NHV10	309004 0528	<b>37,20</b>
NV15,0401,02	15	4		JS9	4.01	0.2		13	2.3	15	NHV15	309004 1423	<b>37,20</b>
NV15,0501,02	15	5		JS9	5.01	0.2		13	2.8	15	NHV15	309004 0523	<b>37,20</b>
NV15,0601,02	15	6		JS9	6.01	0.2		13	3.3	15	NHV15	309004 0623	<b>37,20</b>

**Type NPV, tight fit, DIN 6885, tolerance P9**

Model	Ø mm	Width mm	Depth mm	Tolerance	B mm	r mm	f mm	L mm	t max. mm	D min. mm	suitable for holder	art.no.	€
NPV.0498,02	22	5	2.3	P9	4.98	0.2	8.0	17.3	2.7	22	NHV22	<b>309005</b> 0490	<b>36,70</b>
NPV.0598,02	22	6	2.8	P9	5.98	0.2	8.0	17.3	3.4	22	NHV22	309005 0598	<b>36,70</b>
NPV.0798,02	> 22-30	8	3.3	P9	7.98	0.2	8.0	17.3	4.1	22	NHV22 / NHV30	309005 0798	<b>36,70</b>
NPV.0998,03	> 30-38	10	3.3	P9	9.98	0.3	8.0	17.3	4.2	30	NHV30	309005 0998	<b>36,70</b>
NPV.1197,03	> 38-44	12	3.3	P9	11.98	0.3	10.9	20.1	5.7	40	NHV38	309005 1197	<b>36,70</b>
NPV.1397,03		14		P9	13.97	0.3		20.1	7.5	45	NHV22 - NHV45	309005 1397	<b>42,30</b>
NPV.1597,03		16		P9	15.97	0.3		20.1	7.5	45	NHV22 - NHV45	309005 1597	<b>42,30</b>
NPV.1797,05		18		P9	17.97	0.4		20.1	9.5	45	NHV22 - NHV45	309005 1797	<b>42,30</b>
NPV.1997,05		20		P9	19.97	0.5		20.1	10	45	NHV22 - NHV45	309005 1997	<b>42,30</b>
NV10,298.02	10	3		P9	2.98	0.2		8.2	1.8	10	NHV10	309005 0298	<b>37,20</b>
NV10,398.02	10	4		P9	3.98	0.2		8.2	2.3	10	NHV10	309005 0398	<b>37,20</b>
NV10,498.02	10	5		P9	4.98	0.2		8.2	2.8	10	NHV10	309005 0498	<b>37,20</b>
NV15,398.02		4		P9	3.98	0.2		13	2.3	15	NHV15	309005 1398	<b>37,20</b>
NV15,498.02		5		P9	4.98	0.2		13	2.8	15	NHV15	309005 1498	<b>37,20</b>
NV15,598.02		6		P9	5.98	0.2		13	3.3	15	NHV15	309005 1598	<b>37,20</b>

3130  
Continued on next page >>>




**Type NV standard DIN 138 tolerance C11**

NEW

Model	Width mm	Tolerance	B mm	r mm	L mm	t max. mm	D min. mm	suitable for holder	art.no.	€
NV.15,0410,050	4	C11	4.10	0.5	13	2.2	15	NHV15	<b>309009</b> 0422	<b>37,20</b>
NV.15,0510,050	5	C11	5.1	0.5	13	2.5	15	NHV15	309009 0525	<b>37,20</b>
NV.15,0612,085	6	C11	6.12	0.85	13	2.6	15	NHV15	309009 0626	<b>37,20</b>

3130

**Type NPV standard DIN 6885 tolerance H9**

NEW

Model	Width mm	Tolerance	B mm	r mm	L mm	t max. mm	D min. mm	suitable for holder	art.no.	€
NPV.050H.02	5	H9	5.02	0.2	17.3	2.7	22	NHV22	<b>309007</b> 0527	<b>37,20</b>
NPV.060H.02	6	H9	6.02	0.2	17.3	3.4	22	NHV22	309007 0634	<b>37,20</b>
NPV.080H.02	8	H9	8.02	0.2	17.3	4.1	30	NHV22 / NHV30	309007 0841	<b>37,20</b>
NPV.100H.03	10	H9	10.02	0.3	17.3	4.2	38	NHV22 - NHV38	309007 1042	<b>37,20</b>
NPV.120H.03	12	H9	12.03	0.3	20.1	5.7	38	NHV22 - NHV38	309007 1257	<b>37,20</b>

3130

**Type NPV standard DIN 6885 tolerance D9**

NEW

Model	Width mm	Tolerance	B mm	r mm	L mm	t max. mm	D min. mm	suitable for holder	art.no.	€
NPV.060D.02	6	D9	6.05	0.2	17.3	3.4	22	NHV22	<b>309008</b> 0634	<b>37,20</b>
NPV.080D.02	8	D9	8.06	0.2	17.3	4.1	30	NHV22 / NHV30	309008 0841	<b>37,20</b>
NPV.100D.03	10	D9	10.06	0.3	17.3	4.2	38	NHV22 - NHV38	309008 1042	<b>37,20</b>
NPV.120D.03	12	D9	12.08	0.3	20.1	5.7	38	NHV22 - NHV38	309008 1257	<b>37,20</b>
NPV.140D.03	14	D9	14.08	0.3	20.1	7.5	45	NHV22 - NHV45	309008 1475	<b>42,30</b>
NPV.160D.03	16	D9	16.08	0.3	20.1	7.5	45	NHV22 - NHV45	309008 1675	<b>42,30</b>
NPV.180D.05	18	D9	18.08	0.5	20.1	9.5	45	NHV22 - NHV45	309008 1895	<b>42,30</b>
NPV.200D.05	20	D9	20.1	0.5	20.1	10	45	NHV22 - NHV45	309008 2010	<b>42,30</b>
NV10,030D.02	3	D9	3.05	0.2	8.2	1.8	10	NHV10	309008 0030	<b>37,20</b>
NV10,040D.02	4	D9	4.05	0.2	8.2	2.3	10	NHV10	309008 0040	<b>37,20</b>
NV10,050D.02	5	D9	5.05	0.2	8.2	2.8	10	NHV10	309008 0050	<b>37,20</b>
NV15,040D.02	4	D9	4.05	0.2	13	2.3	15	NHV15	309008 0423	<b>37,20</b>
NV15,050D.02	5	D9	5.05	0.2	13	2.8	15	NHV15	309008 0528	<b>37,20</b>
NV15,060D.02	6	D9	6.05	0.2	13	3.3	15	NHV15	309008 0633	<b>37,20</b>

3130

## Over 200,000 tools available online!

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages


**Register online now!**

# www.saratools.com

## Dümmel® Tool holder for hexagonal slotting

NEW

- Hexagonal slotting on CNC lathes, milling machines and machining centres
- From hexagonal 13 to 32
- Holder with internal cooling

### Type NHV holder for hexagonal slotting

Model	d g6 mm	d1 mm	f mm	L1 mm	L2 mm	D min. mm	for indexable inserts	L mm	art.no.	€
NHV.15.SW25,2	25	33	6.9	50	40	13	NV15.SW13,20	90	<b>309010</b> 0015	211,-
NHV.22.SW25,1	25	33	10	60	50	20	NPV.SW20,32	100	309010 0022	205,-

3130

### Cutting insert NV / NPV for hexagonal slotting, wrench width-across flats 13 to 32

Model	B mm	B1 mm	R mm	L mm	H mm	Wr. width mm	D min. mm	art.no.	€
NV15.SW13,20	10.4	6.0	0.2	11.5	3.2	SW13 - SW20	13	<b>309011</b> 1320	39,20
NPV.SW20,32	16.3	9.4	0.3	16.8	6.3	SW20 - SW32	20	309011 2032	39,20

3130



## ATORN® Keyway slotting sets for longitudinal grooves

- Keyway slotting on CNC lathes, milling machines and machining centres
- Keyway slotting of longitudinal grooves in accordance with DIN 6885
- **Cutting inserts loose fit in accordance with DIN 6885**
- Tolerance class JS9
- Cutting material: AL41F, TiAlN-coated

**Economical keyway slotting even  
in very small production runs!**

### NPU 5-piece keyway slotting set, bore Ø from 6 mm

Contents	art.no.	€
1x clamp mounting, NHU.0025.1   3x cutting inserts: NPU.0200.01.1   NPU.0300.01.1   NPU.0400.01.1   1x hex key for groove widths 2 / 3 / 4 mm	<b>307010</b> 0001	232,-

3130

### NP10 4-piece keyway slotting set, bore Ø from 10 mm

Contents	art.no.	€
1x clamp mounting, NH10.0025.1   2x cutting inserts: NP10.400.02.3   NP10.500.02.3   1x hex key for groove widths 4 / 5 mm	<b>308010</b> 0001	265,-

3130

### NPV 5-piece keyway slotting set, bore Ø from 22 mm

Contents	art.no.	€
1x clamp mounting, NHV.22.0025.1   3x cutting inserts: NPV.0501.02, NPV.0601.02   NPV.0801.02   1x Torx key TX 15 for groove widths 5 / 6 / 8 mm	<b>309010</b> 0001	224,-

3130



## zeus Smoothing tool SET 510 / 520

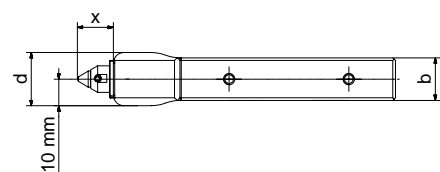
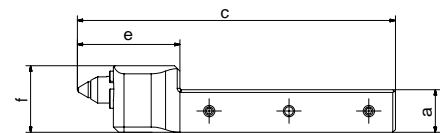
- The Zeus smoothing tool is an all-rounder in all conventional surface-smoothing operations.
- Whether on straight, conical or concave surfaces
- Planar sides can also be machined.
- Not suitable for interrupted cutting.

### Smoothing tool holder SET 510

- **Properties**
  - Fixed tool head
  - **Supplied without smoothing tips**
    - Can be adjusted up to  $\pm 10^\circ$  thanks to integrated setting option in the shank
    - For smoothing cylindrical shafts
- **Recommendation**
  - Polishing speed up to 200 m/min
  - Feed up to 0.2 mm/rev
  - Workpiece allowance of 0.01 mm (~RZ 10) and 0.02 mm (~RZ 20)
  - Cooling lubricant is recommended
- Tool holder SET 510-10U including 12x12 mm and 16x16 mm shank adapter
- Tool holder SET 510-16U including 20x20 mm and 25x25 mm shank adapter

Designation	Contents	a mm	b mm	c mm	d mm	e mm	f mm	x mm	art.no.	€
510-10	SET 510-10U, shank adapter 12x12 mm, 16x16 mm	10	10	110	16	30	18	9	380200 0001	719,-
510-16	SET 510-16U, shank adapter 20x20 mm, 25x25 mm	16	16	119.5	20	39	25	13.5	380200 0002	739,-

3161

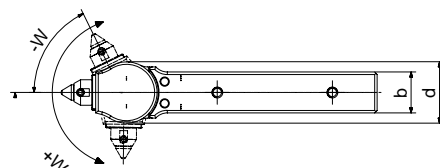
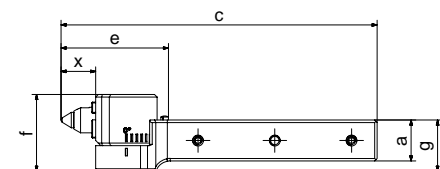


### Smoothing tool holder SET 520

- **Properties**
  - Variably adjustable tool head
  - **Supplied without smoothing tips**
    - Tool for universal applications
    - Swivel range  $\pm 90^\circ$
    - Use up to the collar
    - The adjusting options of the tool head allow the smoothing of planar surfaces, as well as conical, convex and concave geometries.
- **Recommendation**
  - Polishing speed up to 200 m/min
  - Feed up to 0.2 mm/rev
  - Workpiece allowance of 0.01 mm (~RZ 10) and 0.02 mm (~RZ 20)
  - Cooling lubricant is recommended
- Tool holder SET 520-10U including 12x12 mm and 16x16 mm shank adapter
- Tool holder SET 520-16U including 20x20 mm and 25x25 mm shank adapter

Designation	Contents	a mm	b mm	c mm	d mm	e mm	f mm	g mm	x mm	Angle	art.no.	€
520-10	SET 520-10U, shank adapter 12x12 mm, 16x16 mm	10	10	118.5	20	36	25	17.5	9	+60 to -60	380200 0003	789,-
520-16	SET 520-16U, shank adapter 20x20 mm, 25x25 mm	16	16	123.5	24	42	30	20	13.5	+90 to -90	380200 0004	829,-

3161



### Diamond smoothing tip

Designation	R mm	art.no.	€
Diamond smoothing tip 0.4	0.4	380205 0004	619,-
Diamond smoothing tip 0.6	0.6	380205 0006	619,-
Diamond smoothing tip 0.8	0.8	380205 0008	619,-
Diamond smoothing tip 1.0	1.0	380205 0010	619,-

3161





## Perfect labelling for every application

### Full flexibility

Labelling can be applied everywhere, right up to the collar and on any given workpiece diameter. Ideal for several series with various workpieces and/or changing inscriptions.

### Efficiency for all series sizes

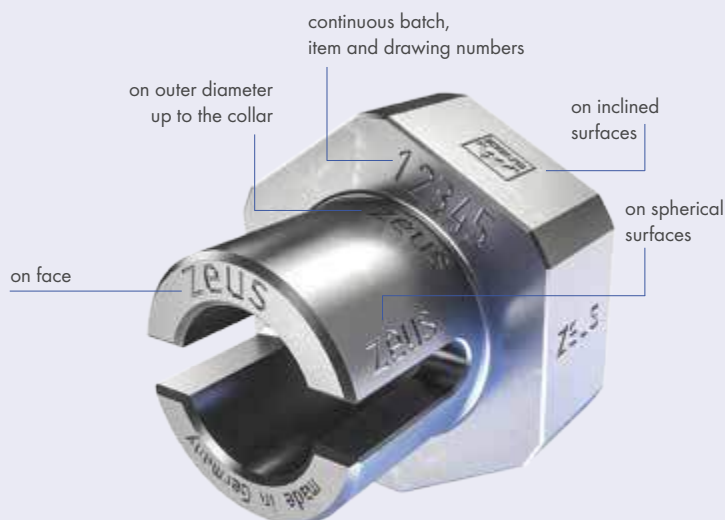
zeus labelling technology is equally suitable for all batch sizes and guarantees efficiency in all applications.



## Precise in every position

Where can the workpieces be labelled?

The example shows that you can inscribe practically everywhere. Whether on spherical surfaces, on the collar, on inclined surfaces or on the face - zeus labelling technology meets your requirements.



## The right labelling system

We would be happy to determine the right labelling system for your application. Send us your enquiry with your specifications.

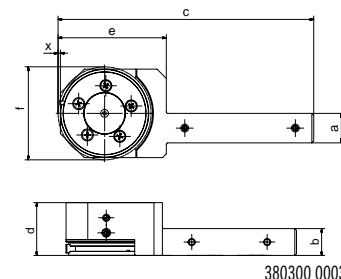
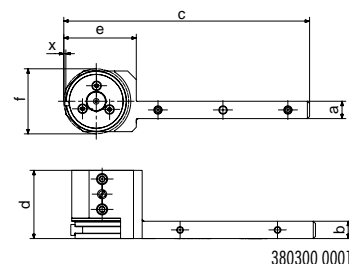
Don't hesitate to contact us in person.

We offer comprehensive advice and find the optimum solution for you!



## zeus Labelling tool 432

- The Zeus lettering system is versatile, as it is not governed by the workpiece diameter.
- Interchangeable segments allow flexible, fast and low-cost adjustment of the text for various applications.
- For materials up to a tensile strength of 1000 N/mm.
- Available only on request for materials with a greater tensile strength.
- Embossing depth of 0.15 mm in diameter.



### Labelling set 432

- Sets supplied in high-quality plastic case, without letters, numbers and special characters

#### • Lettering set 4312-08

- 1 x basic shank (full shank version) tool 432-08
- 1 x shank adapter 10x10 mm, 12x12 mm and 16x16 mm
- 1 x start and end segment

#### • Lettering set 4312-16

- 1 x basic shank (full shank version) tool 432-16R
- 1 x shank adapter 20x20 mm and 25x25 mm
- 1 x start and end segment

Designation	a mm	b mm	c mm	d mm	e mm	f mm	x mm	for Ø mm	Left-hand		Right-hand	
									art.no.	€	art.no.	€
Labelling set R/L 432-08 incl. start and end segment	8	8	113.5	31.5	33.5	30	1	30	380300 0001	829,-	380300 0002	829,-
Labelling set R/L 432-16 incl. start and end segment	16	16	138.5	31.5	58.5	50	1	50	380300 0003	1.039,-	380300 0004	1.039,-
									3126		3126	

### Lettering segment set for 432-08 R/L

#### • Properties

- Lettering segment independent of tool diameter
- Segments are individually exchangeable
- Full depth and sharpness of the script is achieved through an embossing process.

#### • Application

- Exact positioning of the lettering on the workpiece circumference
- Point height corresponds to the first embossed dot
- Individually configurable embossing position
- Lettering right up to the collar is possible
- Change the reading direction by rotating the T-shaped segments

#### • Individual letters and numbers are available on request.

Description	Typeface height mm	Dimensions	for Ø mm	for holder	art.no.	€
Lettering segment set A-Z	2	30 x 8 x 18 mm	30	432...	380305 3002	1.109,-
Lettering segment set 0-9	2	30 x 8 x 18 mm	30	432...	380305 3012	425,-
Lettering segment set A-Z	3	30 x 8 x 18 mm	30	432...	380305 3003	1.109,-
Lettering segment set 0-9	3	30 x 8 x 18 mm	30	432...	380305 3013	425,-
					3126	



### Lettering segment set for 432-16 R/L

#### • Properties

- Lettering segment independent of tool diameter
- Segments are individually exchangeable
- Full depth and sharpness of the script is achieved through an embossing process.

#### • Application

- Exact positioning of the lettering on the workpiece circumference
- Point height corresponds to the first embossed dot
- Individually configurable embossing position
- Lettering right up to the collar is possible
- Change the reading direction by rotating the T-shaped segments

#### • Individual letters and numbers are available on request.

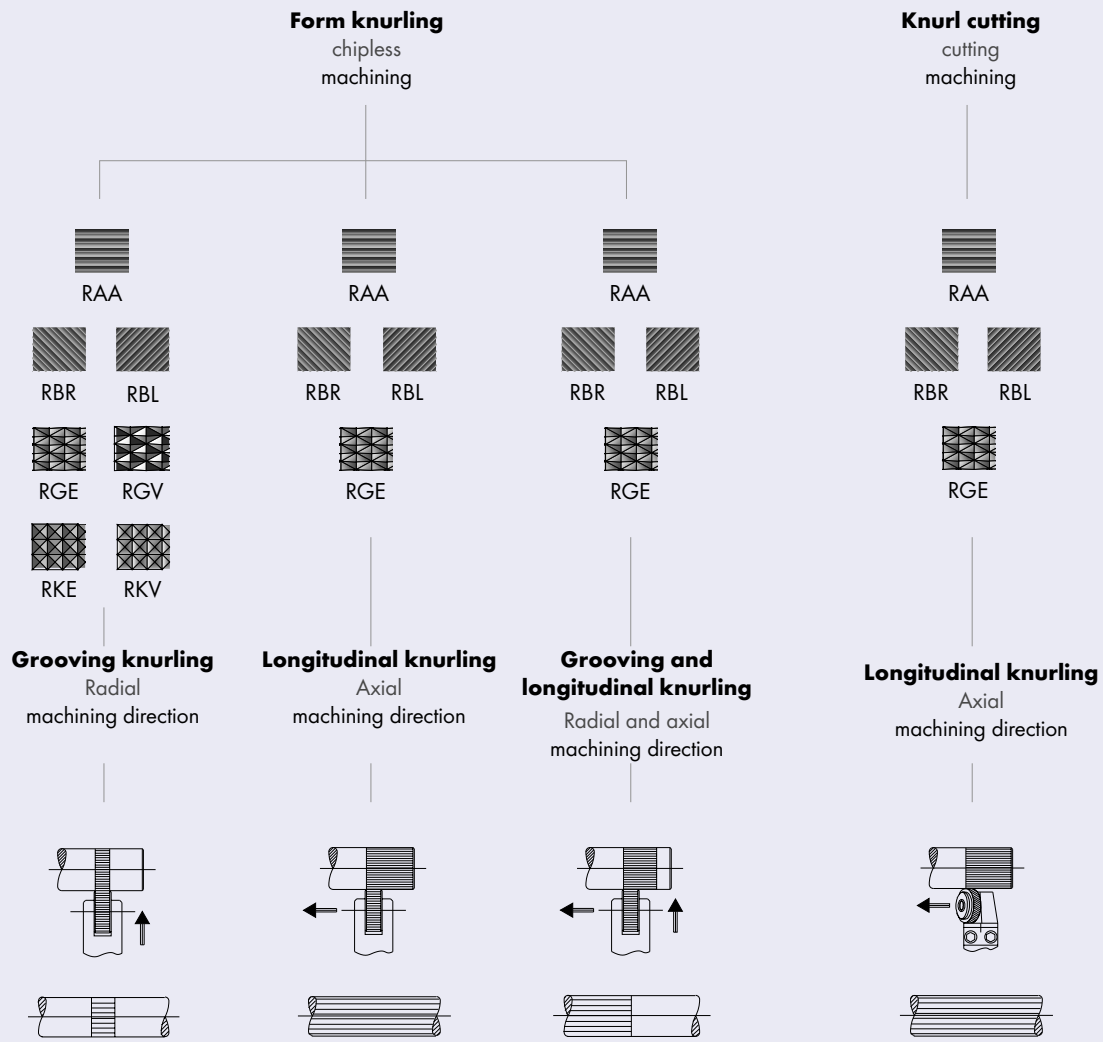
Description	Typeface height mm	Dimensions	for Ø mm	for holder	art.no.	€
Lettering segment set A-Z	2	50 x 8 x 38 mm	50	432...	380305 5002	1.109,-
Lettering segment set 0-9	2	50 x 8 x 38 mm	50	432...	380305 5012	425,-
Lettering segment set A-Z	3	50 x 8 x 38 mm	50	432...	380305 5003	1.109,-
Lettering segment set 0-9	3	50 x 8 x 38 mm	50	432...	380305 5013	425,-
					3126	



### Start and end segment

Description	Dimensions	for Ø mm	for holder	art.no.	€
Start segment Ø30 with 3 drive points	30 x 8 mm	30	432...	380306 0001	62,60
End segment Ø30 90° incl. grub screws	30 x 8 mm	30	432...	380306 0002	110,50
End segment Ø50 60° incl. grub screws	50 x 8 mm	50	432...	380306 0004	110,50
Start segment Ø50 with 3 drive points	50 x 8 mm	50	432...	380306 0003	62,60
				3126	





TOOL SERIES

**Form knurling**

**130/131/132**  
all profiles

**Form knurling**

**130/131/132**

- RAA
- RBL
- RBR

**141/142/161**

- RAA
- RGE
- RBR
- RBL

**192**

- RAA
- RGE 30°
- RGE 45°

**Form knurling**

**130/131/132**

- RAA
- RBL
- RBR

**141/142/161**

- RAA
- RGE
- RBR
- RBL

**Knurl cutting**

**231**

- RAA
- RBL
- RBR

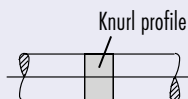
**241**

- RGE 30°
- RGE 45°

**241**

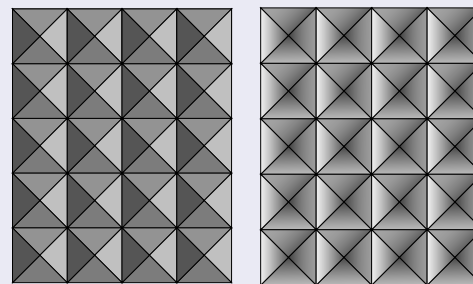
- RGE 30°
- RGE 45°

EXAMPLE:



EXPLANATION OF THE ARROWS:

- ↑ Knurl can only be produced in a radial direction (grooving knurling)
- ← Knurl can only be produced in an axial direction (longitudinal knurling)
- ↔ Knurl can be produced in an axial and a radial direction



Knurl profile (DIN 82)	Production process	
	Form knurling	Knurl cutting
<b>RAA knurl with axially parallel score marks</b> 		
<b>RBL left knurl</b> 		
<b>RBR right knurl</b> 		
<b>RGE left / right knurl, tips increased, 30°</b> 		
<b>RGV left / right knurl, tips deepened, 30°</b> 		
<b>RKE cross knurl, tips increased, 90°</b> 		
<b>RKV cross knurl, tips deepened, 90°</b> 		



## zeus ECO knurling tool for 1 knurling wheel



- Use: Form knurling (chipless forming), all types of knurl pattern, lettering and profiles
- Knurling wheels: all knurl forms can be used
- Machine type: conventional and automated lathes, centre height must be set
- Supplied without knurling wheel

Description	Shank width mm	Shank height mm	L mm	Working area mm	for knurling wheel mm	Type	Holder without wheel art.no.	€
Straight version	16	16	130.5	15 - 200	20 x 8 x 6	130	<b>380101 0001</b>	<b>23,80</b>
Straight version	8	8	99	3-20	15 x 4 x 4	130	380101 1508	<b>23,80</b>

3126



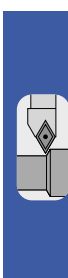
## zeus Knurling tool for 1 knurling wheel



- Application: Knurl forms (chipless forming), all types of knurling patterns, profiles and lettering
- Thumb wheels: all knurl forms can be used
- Machine type: Lathes and automatic lathes (conventional and CNC), point height integrated in the tool holder
- Special surface hardening for increased wear resistance
- Carbide runner pins for higher rotational speeds, faster machining, longer endurance
- **CLICK PIN system**
- Supplied without knurling wheel

Description	Shank width mm	Shank height mm	L mm	Working area mm	for knurling wheel mm	Type	Holder without wheel art.no.	€
Right-hand version	12	12	99	3 - 50	15 x 4 x 4	131	<b>380102 1012</b>	<b>111,50</b>
Right-hand version	10	10	99	3 - 50	15 x 4 x 4	131	380102 1510	<b>111,50</b>
Right-hand version	16	16	99	3 - 50	15 x 4 x 4	131	380102 1516	<b>111,50</b>
Universal, right-hand + left-hand	20	20	109.5	8 - 200	20 x 8 x 6	131	380102 0011	<b>159,-</b>
Universal, right-hand + left-hand	20	25	109.5	8 - 200	20 x 8 x 6	131	380102 2025	<b>159,-</b>

3126



# CLICK-PIN<sup>®</sup> system

for switching the knurling wheel  
quickly and safely



## zeus Spare parts for knurling tools



Runner pin



Runner pin with flat surface



Runner pin with radius notch



Pressure piece



Spare parts set with greased bush

Description	art.no.	€
Spare parts set: carbide bush, cover disc and right-hand countersunk screw, suitable for 3801502026 / 3801550525	<b>380110 9907</b>	<b>82,70</b>
Spare parts set: bush, cover disc and screw, suitable for 3801511212	380110 9906	<b>83,70</b>
Spring-loaded pressure piece M4 x 7 mm for Click Pin system, suitable for 3801020011 from 06/2017	380110 9909	<b>11,20</b>
Runner pin, 6 x 20 mm for Click Pin system, suitable for 3801020011 from 06/2017	380110 9908	<b>16,-</b>
Carbide runner pin, 4 x 12 mm with flat surface, suitable for 3801020103	380110 9902	<b>8,05</b>
Carbide runner pin, 6 x 20 mm with flat surface, suitable for 3801090005	380110 9904	<b>12,75</b>
HSS runner pin, 4 x 12 mm with flat surface, suitable for 3801091001	380110 9903	<b>2,45</b>
HSS runner pin, 6 x 18 mm, suitable for 3801010001	380110 9901	<b>1,23</b>
HSS runner pin, 6 x 20 mm with flat surface, suitable for 3801050001	380110 9905	<b>2,45</b>

3126



## ECO knurling tools, for 2 knurling wheels



- Use: Form knurling (chipless forming), workpiece knurl profile in accordance with DIN 82: RAA, RGE 30°
- Knurling wheels: **RAA** = 2x type AA; **RGE 30°** = 1x BL 30°, 1x BR 30°
- Machine type: Lathes and automated lathes (conventional and CNC), centre height integrated in the tool
- Supplied without knurling wheels

### With flexible centring

Description	Shank width mm	Shank height mm	L mm	Working area mm	for knurling wheel mm	Type	Holder w/o wheels art.no.	€
Straight version	20	20	130	10 - 110	20 x 8 x 6	141	<b>380105 0001</b>	<b>96,40</b>

3126



### Running pin with flat surface, secured by screw, quick-change knurling wheels

Description	Shank width mm	Shank height mm	L mm	Working area mm	for knurling wheel mm	Type	Holder w/o wheels art.no.	€
Right-hand	12	12	101	8 - 15	15 x 4 x 4	851	<b>380109 1001</b>	<b>84,20</b>
Right-hand	20	20	130	10 - 80	20 x 8 x 6	851	<b>380109 2020</b>	<b>86,20</b>

3126



## Knurling tool for 2 knurling wheels

NEW



- Use: Form knurling (chipless forming), workpiece knurl profile in accordance with DIN 82: RAA, RGE 30°
- Knurling wheels: **RAA** = 2x type AA; **RGE 30°** = 1x BL 30°, 1x BR 30°
- Machine type: Lathes and automated lathes (conventional and CNC), centre height integrated in the tool holder
- Modular design, knurling tool can be used universally as a right-hand and left-hand version, retooling simply involves turning the knurling head
- Special surface hardening for increased wear resistance
- Carbide runner pins for higher speeds, faster machining, longer service life
- With flexible centring
- Clearance angle correction by means of grub screws in the shank
- Supplied without knurling wheels

Description	Shank width mm	Shank height mm	L mm	Working area mm	for knurling wheel mm	Type	Holder w/o wheels art.no.	€
Straight version	16	16	119	6 - 60	15 x 4 x 4	141	<b>380103 1516</b>	<b>219,-</b>
Straight version	20	20	130	10 - 110	20 x 8 x 6	141	<b>380103 2020</b>	<b>256,-</b>
Straight version	20	25	130	10 - 110	20 x 8 x 6	141	<b>380103 2025</b>	<b>282,-</b>

3126



## Knurl cutting tool for 1 knurling wheel, 25 x 6 x 8 mm

NEW



- Use: Knurl cutting, workpiece knurl profile according to DIN 82: RAA
- Knurling wheels: RAA = 1 x BR 30° for right-hand use, RAA = 1 x BL 30° for left-hand use
- Machine type: conventional and CNC automated lathes, centre height integrated in the tool
- Modular design, tool can be used universally as a right-hand or left-hand version
- Quick retooling by simply removing and turning the knurling head, precise axis position after every reassembly thanks to 3-point support
- With position indicator for optimum initial positioning
- Fine adjustment of the knurling head via threaded spindle with scale
- Precise control for axially parallel knurling thanks to adjustable knurling head
- Clearance angle set using grub screws in the shank
- Special surface hardening for increased wear resistance
- Supplied without knurling wheel

Design	Shank width mm	Shank height mm	Total length mm	Working area mm	for knurling wheel mm	Type	Holder without wheel art.no.	€
Universal R/L	12	12	103.5	3 - 50	15 x 4 x 8	231	<b>380150 1212</b>	<b>475,-</b>
Universal R/L	16	16	103.5	3 - 50	15 x 4 x 8	231	<b>380150 1516</b>	<b>475,-</b>
Universal R/L	20	20	130.8	10 - 300	25 x 6 x 8	231	<b>380150 2520</b>	<b>485,-</b>
Universal R/L	25	25	130.8	10 - 300	25 x 6 x 8	231	<b>380150 2525</b>	<b>499,-</b>

3126



**Knurl cutting tool for 2 knurling wheels****NEW**

- Use: Knurl cutting, workpiece knurl profile according to DIN 82: RGE30°, RGE45°
- Knurling wheels: RGE30° = 2x type AA, RGE45° = 1x BL 15° and 1x BR 15°
- Machine type: Lathes and automated lathes, conventional and/or CNC
- Modular design: Tool can be used universally as a right-hand or left-hand version
- Fast retooling by simply removing and turning the knurling head,
- Flexible application: vertical height adjustment for use on shank sizes 20 and 25 mm
- Easy to set: setting scale and setting spindle for quickly adjusting the manufacturing diameter
- Fine adjustment of the centre height by means of cutter spindle height adjustment
- Stable construction: toothing between the tool holder and the cutter head
- Special surface hardening for increased wear resistance
- Vertical height adjustment for use on shank sizes 20 and 25 mm
- Supplied without knurling wheel

Design	Shank width mm	Shank height mm	Total length mm	Working area mm	for knurling wheel mm	Type	Holder w/o wheels art.no.	€
Universal R/L	12	12	116	3 - 50	15 x 4 x 8	241	<b>380155 1512</b>	<b>709,-</b>
Universal R/L	16	16	116	3 - 50	15 x 4 x 8	241	380155 1516	<b>709,-</b>
Universal R/L	20	20	134	10 - 250	25 x 6 x 8	241	380155 0525	<b>1.119,-</b>
Universal R/L	20	25	133.3	10 - 250	25 x 6 x 8	241	380155 2525	<b>1.119,-</b>

3126

**ECO knurling tool set****NEW**

- 2 holders with a total of 11 knurling wheels
- can be used universally as a right-hand and left-hand version
- conventional and CNC automatic lathes
- for knurl profiles RAA and RGE30°
- knurling wheels 20 x 8 x 6
  - AA type: 3 x pitch 0.8 and 2 x pitch 1.0
  - BL type: 2 x pitch 0.8 and one of each 1 x pitch 1.0 / 1.2
  - BR type: one of each 1 x pitch 0.8 / 1.2
- Supplied in a plastic case



Contents	art.no.	€
1 of each holder: 16 x 16 mm shank, (RW 830) shank 20 x 20 mm, (RW851) + knurling wheels 20 x 8 x 6 as per article description	<b>380157 0005</b>	<b>301,-</b>

3126

**Examples of knurling products****INFO**



## Precision knurling wheels

PM

DIN  
403

1098

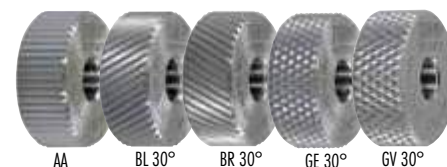
PM and PM-Tenifer

- Teeth precision-milled to the exact pitch
- Fully hardened knurl, hardness HRC 61+2
- Flat faces and bore are ground
- **Chamfering on both sides for form knurling**
- **Sharp-edged for knurl cutting**
- **Material: PM, PM-Tenifer with surface treatment** to enhance service life

## 15 x 4 x 4 (Ø x width x bore), with chamfer

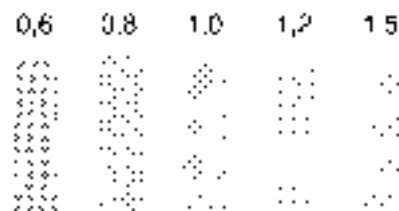
Type	Division mm	PM	
		art.no.	€
AA	0.6	<b>380130</b> 0106	<b>27,70</b>
AA	0.8	380130 0108	<b>27,70</b>
AA	1.0	380130 0110	<b>27,70</b>
AA	1.2	380130 0112	<b>27,70</b>
AA	1.5	380130 0115	<b>27,70</b>
BL 30°	0.6	380130 0206	<b>27,70</b>
BL 30°	0.8	380130 0208	<b>27,70</b>
BL 30°	1.0	380130 0210	<b>27,70</b>
BL 30°	1.2	380130 0212	<b>27,70</b>
BL 30°	1.5	380130 0215	<b>27,70</b>
BR 30°	0.6	380130 0306	<b>27,70</b>
BR 30°	0.8	380130 0308	<b>27,70</b>
BR 30°	1.0	380130 0310	<b>27,70</b>
BR 30°	1.2	380130 0312	<b>27,70</b>
BR 30°	1.5	380130 0315	<b>27,70</b>
GE 30°	0.6	380130 0406	<b>41,40</b>
GE 30°	0.8	380130 0408	<b>41,40</b>
GE 30°	1.0	380130 0410	<b>41,40</b>
GE 30°	1.2	380130 0412	<b>41,40</b>
GV 30°	0.8	380130 0508	<b>35,60</b>
GV 30°	1.0	380130 0510	<b>35,60</b>

3126



RAA

RGE



## 20 x 8 x 6 (Ø x width x bore), with chamfer

Type	Division mm	PM		PM-Tenifer	
		art.no.	€	art.no.	€
AA	0.6	<b>380132</b> 0106	<b>30,70</b>	<b>380133</b> 0106	<b>34,10</b>
AA	0.8	380132 0108	<b>30,70</b>	380133 0108	<b>34,10</b>
AA	1.0	380132 0110	<b>30,70</b>	380133 0110	<b>34,10</b>
AA	1.2	380132 0112	<b>30,70</b>	380133 0112	<b>34,10</b>
AA	1.5	380132 0115	<b>30,70</b>	380133 0115	<b>34,10</b>
BL 30°	0.6	380132 0206	<b>30,70</b>	380133 0206	<b>34,10</b>
BL 30°	0.8	380132 0208	<b>30,70</b>	380133 0208	<b>34,10</b>
BL 30°	1.0	380132 0210	<b>30,70</b>	380133 0210	<b>34,10</b>
BL 30°	1.2	380132 0212	<b>30,70</b>	380133 0212	<b>34,10</b>
BL 30°	1.5	380132 0215	<b>30,70</b>	380133 0215	<b>34,10</b>
BR 30°	0.6	380132 0306	<b>30,70</b>	380133 0306	<b>34,10</b>
BR 30°	0.8	380132 0308	<b>30,70</b>	380133 0308	<b>34,10</b>
BR 30°	1.0	380132 0310	<b>30,70</b>	380133 0310	<b>34,10</b>
BR 30°	1.2	380132 0312	<b>30,70</b>	380133 0312	<b>34,10</b>
BR 30°	1.5	380132 0315	<b>30,70</b>	380133 0315	<b>34,10</b>
GE 30°	0.6	380132 0406	<b>48,-</b>	380133 0406	<b>51,40</b>
GE 30°	0.8	380132 0408	<b>48,-</b>	380133 0408	<b>51,40</b>
GE 30°	1.0	380132 0410	<b>48,-</b>	380133 0410	<b>51,40</b>
GE 30°	1.2	380132 0412	<b>48,-</b>	380133 0412	<b>51,40</b>
GE 30°	1.5	380132 0415	<b>48,-</b>	380133 0415	<b>51,40</b>
GV 30°	0.8	380132 0508	<b>48,60</b>	380133 0508	<b>52,-</b>
GV 30°	1.0	380132 0510	<b>48,60</b>	380133 0510	<b>52,-</b>

3126

3126



**15 x 4 x 8 (Ø x width x bore), sharp-edged**

Type	Division mm	PM	
		art.no.	€
AA	0.6	<b>380190</b> 0106	<b>27,70</b>
AA	0.8	380190 0108	<b>27,70</b>
AA	1.0	380190 0110	<b>27,70</b>
AA	1.2	380190 0112	<b>27,70</b>
BL 15°	0.6	380190 0206	<b>27,70</b>
BL 15°	1.0	380190 0210	<b>27,70</b>
BL 30°	0.6	380190 0406	<b>27,70</b>
BL 30°	0.8	380190 0408	<b>27,70</b>
BL 30°	1.0	380190 0410	<b>27,70</b>
BL 30°	1.2	380190 0412	<b>27,70</b>
BR 15°	0.6	380190 0306	<b>27,70</b>
BR 15°	1.0	380190 0310	<b>27,70</b>
BR 30°	0.6	380190 0506	<b>27,70</b>
BR 30°	0.8	380190 0508	<b>27,70</b>
BR 30°	1.0	380190 0510	<b>27,70</b>
BR 30°	1.2	380190 0512	<b>27,70</b>

3126



AA BL 15° BR 15° BL 30° BR 30°

**25 x 6 x 8 (Ø x width x bore), sharp-edged**

Type	Division mm	PM		PM-Tenifer	
		art.no.	€	art.no.	€
AA	0.6	<b>380192</b> 0106	<b>37,90</b>	<b>380193</b> 0106	<b>41,30</b>
AA	0.8	380192 0108	<b>37,90</b>	380193 0108	<b>41,30</b>
AA	1.0	380192 0110	<b>37,90</b>	380193 0110	<b>41,30</b>
AA	1.2	380192 0112	<b>37,90</b>	380193 0112	<b>41,30</b>
AA	1.5	380192 0115	<b>37,90</b>	380193 0115	<b>41,30</b>
BL 15°	0.6	380192 0206	<b>37,90</b>	380193 0206	<b>41,30</b>
BL 15°	1.0	380192 0210	<b>37,90</b>	380193 0210	<b>41,30</b>
BL 15°	1.2	380192 0212	<b>37,90</b>	380193 0212	<b>41,30</b>
BL 30°	0.6	380192 0406	<b>37,90</b>	380193 0406	<b>41,30</b>
BL 30°	0.8	380192 0408	<b>37,90</b>	380193 0408	<b>41,30</b>
BL 30°	1.0	380192 0410	<b>37,90</b>	380193 0410	<b>41,30</b>
BL 30°	1.2	380192 0412	<b>37,90</b>	380193 0412	<b>41,30</b>
BL 30°	1.5	380192 0415	<b>37,90</b>	380193 0415	<b>41,30</b>
BR 15°	0.6	380192 0306	<b>37,90</b>	380193 0306	<b>41,30</b>
BR 15°	1.0	380192 0310	<b>37,90</b>	380193 0310	<b>41,30</b>
BR 15°	1.2	380192 0312	<b>37,90</b>	380193 0312	<b>41,30</b>
BR 30°	0.6	380192 0506	<b>37,90</b>	380193 0506	<b>41,30</b>
BR 30°	0.8	380192 0508	<b>37,90</b>	380193 0508	<b>41,30</b>
BR 30°	1.0	380192 0510	<b>37,90</b>	380193 0510	<b>41,30</b>
BR 30°	1.2	380192 0512	<b>37,90</b>	380193 0512	<b>41,30</b>
BR 30°	1.5	380192 0515	<b>37,90</b>	380193 0515	<b>41,30</b>

3126

3126



AA BL 15° BL 30° BR 15° BR 30°





RIGHT ACROSS **EUROPE.**

WE MANAGE THAT FOR YOU

**WITHIN  
24 HOURS:**

**24-HOUR DELIVERY  
THROUGHOUT EUROPE**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

# TURNING TOOLS

# TECHNICAL

CUTTING DATA

USAGE RECOMMENDATIONS

MACHINING NOTES

TYPE DESCRIPTIONS

ISO DESIGNATION CODES

PITCH ANGLE CALCULATIONS

SYSTEMS OVERVIEWS



$d2=256$



### 1 Insert form

Diagram showing 18 different insert shapes labeled A through W with their respective angles:

- A: 85°
- B: 82°
- C: 80°
- D: 55°
- E: 75°
- H: 60°
- K: 45°
- L: 90°
- M: 85°
- O: 80°
- P: 60°
- R: 90°
- S: 90°
- T: 60°
- V: 35°
- W: 80°

### 2 Clearance angle

Diagram showing clearance angles for various insert shapes:

- A: 3°
- B: 15°
- C: 17°
- D: 15°
- E: 20°
- F: 25°
- G: 30°
- N: 0°
- P: 11°
- O: Other clearance angle

### 3 Tolerances

	d	m	s
A	± 0.025	± 0.005	± 0.025
C	± 0.025	± 0.013	± 0.025
E	± 0.025	± 0.025	± 0.025
F	± 0.013	± 0.005	± 0.025
G	± 0.025	± 0.025	± 0.05-0.13
H	± 0.013	± 0.013	± 0.025
J <sup>1)</sup>	± 0.05-0.15 <sup>2)</sup>	± 0.005	± 0.025
K <sup>1)</sup>	± 0.05-0.15 <sup>2)</sup>	± 0.013	± 0.025
L <sup>1)</sup>	± 0.05-0.15 <sup>2)</sup>	± 0.013	± 0.025 <sup>1)</sup>
M	± 0.05-0.15 <sup>2)</sup>	± 0.08-0.20 <sup>2)</sup>	± 0.013
M	± 0.05-0.15 <sup>2)</sup>	± 0.08-0.20 <sup>2)</sup>	± 0.025
N	± 0.05-0.25 <sup>2)</sup>	± 0.13-0.38 <sup>2)</sup>	± 0.05-0.13

<sup>1)</sup> Inserts with ground face-edge cutters  
<sup>2)</sup> Each according to insert size (see ISO standard 1832)  
 The tolerances m and d are not dependent on the insert form.

### 6 Insert thickness

	s (mm)
01	1.59
T1	1.98
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

### 7 Corner rounding

	r (mm)
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
24	2.4

Tool cutting edge angle	
A	45°
D	60°
E	75°
F	85°
P	90°
Z	Other

Clearance angle on the face plate	
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
Z	Other

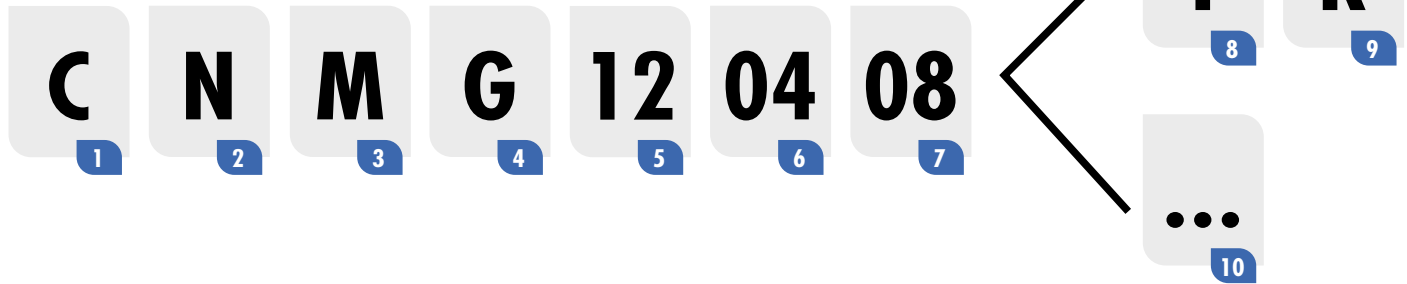
### 8 Cutting edge formation

- E: rounded
- F: sharp-edged
- T: chamfered
- S: chamfered and rounded

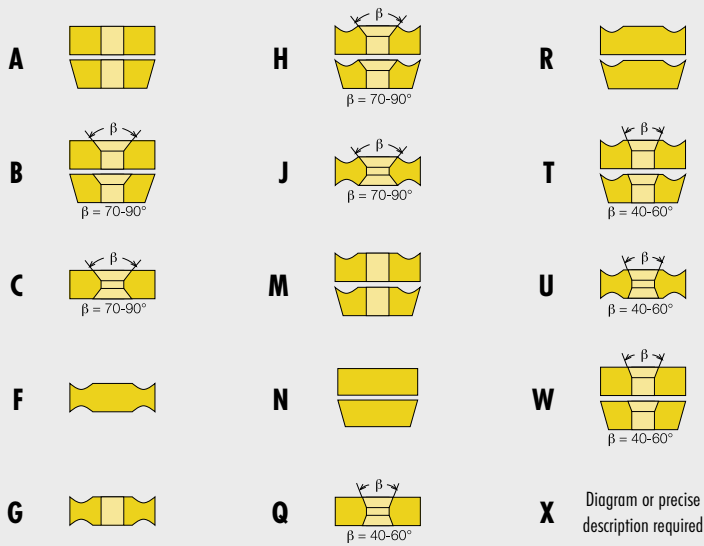
### 9 Cutting direction

- R: Right-hand cutting direction
- L: Left-hand cutting direction
- N: Normal cutting direction

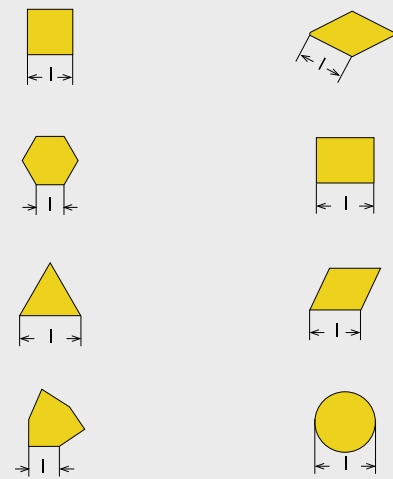
Example of indexable turning inserts



4 Cutting and fixing qualities



5 Cutting edge length



10 Manufacturer information

The ISO code comprises 9 symbols, whereby symbols 8 and/or 9 are used only where necessary. The manufacturer can affix further symbols to the ISO code with a hyphen e.g. to indicate the chip breaker form).

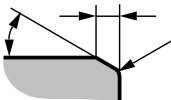
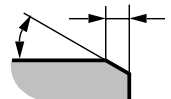




## 1 - 7 ISO designation system

The ISO designation system corresponds to the ISO designation system for indexable turning inserts according to ISO 1832.

## 8 Cutting edge

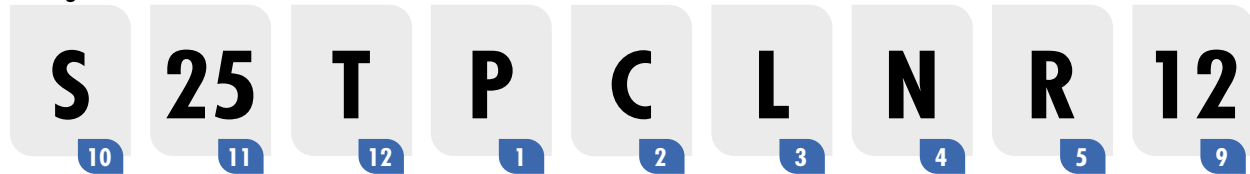
Symbol	Cutting edge design	Example		Shape
<b>S</b>	Chamfered and rounded cutting edge	CNGA 120412 <b>S02020</b>	0.20 mm x 20° chamfered and rounded cutting edge	
<b>T</b>	Chamfered cutting edge	CNGA 120404 <b>T02020</b>	0.20 mm x 20° chamfered cutting edge	

- Ceramic indexable cutting inserts are provided with a cutting edge chamfer.
- These cutting edge chamfers serve to introduce the applied cutting forces into the indexable cutting insert in the form of compressive forces.
- The chamfer width and chamfer angle are adapted to the cutting edge design depending on the application, e.g. for fine and finish turning of cast iron and steel materials => 0.05 mm x 20°, for finish and rough turning of cast iron materials and for medium machining of steel materials 0.20 mm x 20°
- Double chamfers are used for particularly high strain on the tool cutting edge.

Clamp mounting



Boring bars



### 1 Clamping

### 2 Insert form

- C** Rhombic 80°
- D** Rhombic 55°
- K** Parallelogram-shaped 55°
- R** Round
- S** Square
- T** Triangular
- V** Rhombic 35°
- W** Hexagonal 80°

### 3 Holder type

### 4 Clearance angle of the indexable insert

### 5 Cutting direction

- R** Right-hand cutting
- L** Left-hand cutting
- N** Right-hand and left-hand cutting

### 6 Shank height

- 12** = 12 mm
- 25** = 25 mm
- 40** = 40 mm
- etc.

### 7 Shank width

- 12** = 12 mm
- 25** = 25 mm
- 32** = 32 mm
- etc.

### 8 Clamp mounting length

L (mm)	L (mm)
<b>A</b> 32	<b>N</b> 160
<b>B</b> 40	<b>P</b> 170
<b>C</b> 50	<b>Q</b> 180
<b>D</b> 60	<b>R</b> 200
<b>E</b> 70	<b>S</b> 250
<b>F</b> 80	<b>T</b> 300
<b>G</b> 90	<b>U</b> 350
<b>H</b> 100	<b>V</b> 400
<b>J</b> 110	<b>W</b> 450
<b>K</b> 125	<b>Y</b> 500
<b>L</b> 140	<b>X</b> Special
<b>M</b> 150	

### 9 Cutting edges

- 09** = 9.52 mm
- 12** = 12.7 mm
- 25** = 25.4 mm
- etc.

### 10 Design

- S** Steel shank
- A** Cooling through the shank
- C** Solid carbide
- E** Solid carbide, cooling through the shank

### 11 Shank Ø

### 12 Boring bar length

L (mm)	L (mm)
<b>A</b> 32	<b>N</b> 160
<b>B</b> 40	<b>P</b> 170
<b>C</b> 50	<b>Q</b> 180
<b>D</b> 60	<b>R</b> 200
<b>E</b> 70	<b>S</b> 250
<b>F</b> 80	<b>T</b> 300
<b>G</b> 90	<b>U</b> 350
<b>H</b> 100	<b>V</b> 400
<b>J</b> 110	<b>W</b> 450
<b>K</b> 125	<b>Y</b> 500
<b>L</b> 140	<b>X</b> Special
<b>M</b> 150	

ISO  
**P**

In the ISO-P range, general structural steel and unalloyed steel have up to 110 HB (Brinell hardness) and a carbon content of up to 0,55%. There is also low-alloy steel up to 180 HB and high-alloy steel from 200 HB - 400 HB and materials with a hardness of up to max. 48 HRC (Rockwell hardness).

The new turning grades with multilayer CVD layers are particularly suitable for cutting ISO-P materials.

Quality	ISO	Hardness	Coating	Toughness / Wear resistance	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
<b>PHG 115</b>	HC10-P25	HV 1580	CVD-Al <sub>2</sub> O <sub>3</sub> +TiN	<b>Toughness</b>	○	◐	⊕
				1 2 3 4 5 6 7 8 9 10			
<b>PHG 125</b>	HC-P20-P35	HV 1520	CVD-Al <sub>2</sub> O <sub>3</sub> +TiN	<b>Toughness</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>PH 5115</b>	HC-P10-P25 HC-M10-M25	HV 1580	CVD-Al <sub>2</sub> O <sub>3</sub>	<b>Toughness</b>	○	●	○
				1 2 3 4 5 6 7 8 9 10			
<b>PH 5125</b>	HC-P20-P35 HC-M15-M30	HV 1520	CVD-Al <sub>2</sub> O <sub>3</sub>	<b>Toughness</b>	○	●	○
				1 2 3 4 5 6 7 8 9 10			
<b>PH 5115</b>	HC-P10-P25 HC-M10-M25	HV 1580	CVD-Al <sub>2</sub> O <sub>3</sub>	<b>Wear resistance</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>PH 5125</b>	HC-P20-P35 HC-M15-M30	HV 1520	CVD-Al <sub>2</sub> O <sub>3</sub>	<b>Wear resistance</b>	○	●	○
				1 2 3 4 5 6 7 8 9 10			

# ISO M


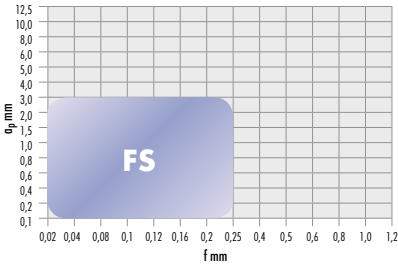







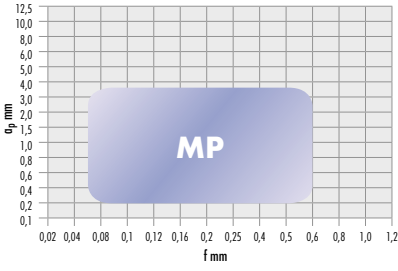







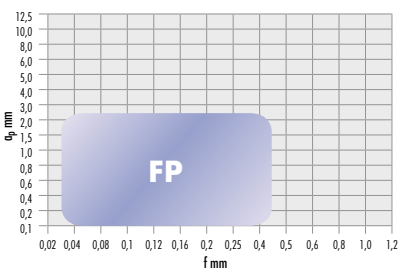







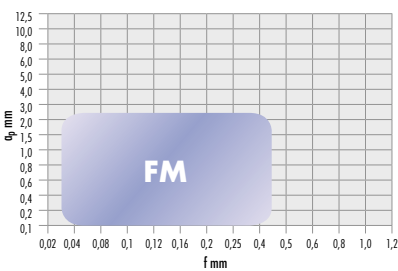







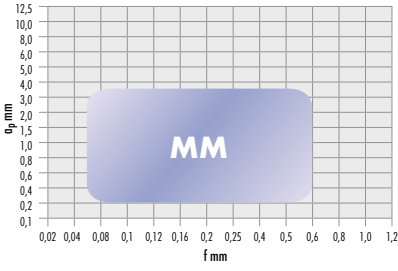






Indexable cutting inserts in the ISO-M area are mainly used in machining ferritic and martensitic stainless steel and austenitic stainless, usually acid-resistant steel (Ni content of over 20%). So-called duplex steel has a two-phase structure and consists of ferrite and austenite. Higher-alloyed duplex materials are also called super-duplex or hyper-duplex.

Quality	ISO	Hardness	Coating	Toughness / Wear resistance	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
<b>PH 7910</b>	HC-P05-P10 HC-M05-M10 HC-S05-S15	HV 1730	PVD, AlTiN-7	<b>Toughness</b>	○	◐	⊕
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>PH 7920</b>	HC-P10-P35 HC-M10-M25 HC-S10-S30	HV 1585	PVD, AlTiN-7	<b>Toughness</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>PH 5740</b>	HC-P25-P45 HC-M25-M45 HC-S20-S40	HV 1385	CVD-Al <sub>2</sub> O <sub>3</sub>	<b>Toughness</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>PHS 215</b>	M10-M25	HV 1580	CVD-Al <sub>2</sub> O <sub>3</sub> +TiC	<b>Toughness</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>PHS 225</b>	M15-M30	HV 1520	CVD-Al <sub>2</sub> O <sub>3</sub> +TiC	<b>Toughness</b>	●	●	○
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	●	○
				1 2 3 4 5 6 7 8 9 10			


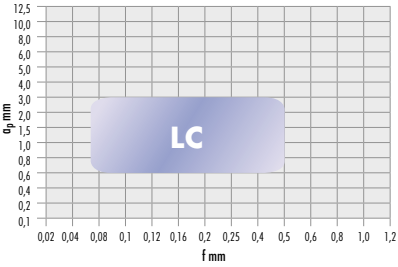




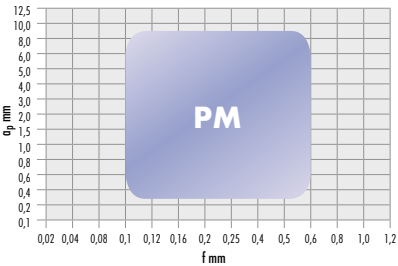




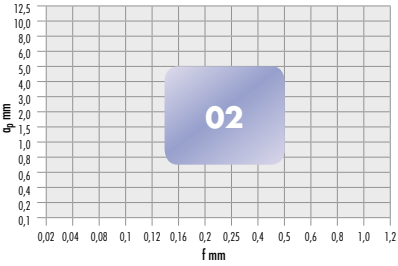




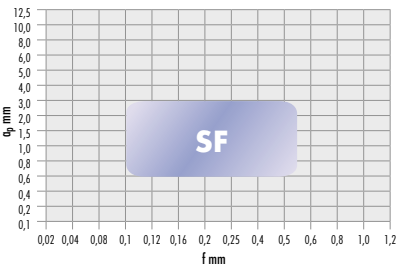



# ISO K

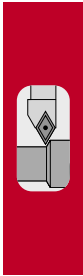
Indexable cutting inserts for the ISO-K area are mainly used for cast iron that can be forged (GG) and spheroidal graphite iron (GGG), as well as for cast iron with vermicular graphite and bainitic cast iron with spheroidal graphite iron.

Quality	ISO	Hardness	Coating	Toughness / Wear resistance	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
<b>PH 5320</b>	HC-P01-P15 HC-K05-K15	HV 1675	CVD-Al <sub>2</sub> O <sub>3</sub> +TiN	<b>Toughness</b>	○	◐	⊕
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	○	●	○
				1 2 3 4 5 6 7 8 9 10			

Chip breaker FS	$a_p$	$f$	ISO P positive chip breaker		
	0,1 - 3,0 mm	0,02 - 0,25 mm/U	ISO M positive chip breaker		
					
		Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
					
Chip breaker MP	$a_p$	$f$	ISO P positive chip breaker		
	0,2 - 3,6 mm	0,06 - 0,6 mm/U	ISO M positive chip breaker		
					
		Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
					
Chip breaker FP	$a_p$	$f$	ISO P positive chip breaker		
	0,1 - 2,4 mm	0,03 - 0,45 mm/U	ISO M positive chip breaker		
					
		Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
					
Chip breaker FM	$a_p$	$f$	ISO M positive chip breaker		
	0,1 - 2,4 mm	0,03 - 0,45 mm/U	ISO P positive chip breaker		
					
		Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
					
Chip breaker MM	$a_p$	$f$	ISO M positive chip breaker		
	0,2 - 3,6 mm	0,06 - 0,6 mm/U	ISO P positive chip breaker		
					
		Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
					



Chip breaker LC	$a_p$ 0,6 - 3,0 mm	$f$ 0,07 - 0,5 mm/U	ISO P negative chip breaker		
					
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut
			●	○	○
Chip breaker PM	$a_p$ 0,3 - 9,0 mm	$f$ 0,1 - 0,6 mm/U	ISO P negative chip breaker		
					
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut
			●	●	○
Chip breaker 02	$a_p$ 0,7 - 5,0 mm	$f$ 0,14 - 0,50 mm/U	ISO P negative chip breaker		
					
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut
			○	●	○
Chip breaker SF	$a_p$ 0,6 - 3,0 mm	$f$ 0,10 - 0,55 mm/U	ISO M negative chip breaker		
					
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut
			●	○	○



ISO  
P

In the ISO-P range, general structural steel and unalloyed steel have up to 110 HB (Brinell hardness) and a carbon content of up to 0.55%. There is also low-alloy steel up to 180 HB and high-alloy steel from 200 HB - 400 HB and materials with a hardness of up to max. 48 HRC (Rockwell hardness).

The new turning grades with multilayer CVD layers are particularly suitable for cutting ISO-P materials.

Sort designation	ISO	Hardness	Coating	Toughness / Wear resistance	Continuous cut	Slightly interrupted cut	Significantly interrupted cut																				
<b>HC 7610</b>	HC-P10 HC-K20	HV 1550	CVD-TiCN + Al <sub>2</sub> O <sub>3</sub> (+ TiCN)	<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	●	●	—
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		
<b>HC 7620</b>	HC-P20 HC-K30	HV 1500	CVD-TiCN + Al <sub>2</sub> O <sub>3</sub> (+ TiCN)	<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	●	●	—
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		
<b>HC 7630</b>	HC-P30 HC-K40	HV 1320	CVD-TiCN + Al <sub>2</sub> O <sub>3</sub> (+ TiCN)	<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	—	●	●
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		
<b>ACP15T</b>	HC-P15 HC-M10 HC-K25	HV 1550	CVD, Ti(Cn)+Al2O3 18,5 µm	<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	●	○	—
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		
<b>ACP25T</b>	HC-P25 HC-K30	HV 1470	CVD-TiCN + Al <sub>2</sub> O <sub>3</sub> (+ TiCN)	<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	●	●	—
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		
<b>ACP35T</b>	HC-P35 HC-M30 HC-K35	HV 1460	CVD, Ti(Cn)+Al2O3 13 µm	<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	○	●	●
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		
<b>ACU20T</b>	HC-P20 HC-M20 HC-K30	HV 1450	CVD, Ti(Cn)+Al2O3 13 µm	<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	●	○	—
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		
<b>ACU40T</b>	HC-P40 HC-M35	HV 1300	CVD, Ti(Cn)+Al2O3 13,0 µm	<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	●	○	○
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		
<b>ATU10T</b>	HT-P15 HT-M10 HT-K10	HV 1620		<b>Toughness</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table> <b>Wear resistance</b> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	●	—	—
1	2	3	4	5	6	7	8	9	10																		
1	2	3	4	5	6	7	8	9	10																		

# ISO M

Indexable cutting inserts in the ISO-M area are mainly used in machining ferritic and martensitic stainless steel and austenitic stainless, usually acid-resistant steel (Ni content of over 20%). So-called duplex steel has a two-phase structure and consists of ferrite and austenite. Higher-alloyed duplex materials are also called super-duplex or hyper-duplex.

Sort designation	ISO	Hardness	Coating	Toughness / Wear resistance	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
<b>HC 7220</b>	HC-M20 HC-S20	HV 1520	PVD-TiAlN + Al <sub>2</sub> O <sub>3</sub> (+ ZrCN)	<b>Toughness</b>	○	◐	⊕
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>HC 7510</b>	HC-M10 HC-P15	HV 1500	CVD-TiAlN + Al <sub>2</sub> O <sub>3</sub> (+ ZrCN)	<b>Toughness</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>HC 7520</b>	HC-M20 HC-P25	HV 1450	CVD-TiAlN + Al <sub>2</sub> O <sub>3</sub> (+ ZrCN)	<b>Toughness</b>	●	●	○
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	●	○
				1 2 3 4 5 6 7 8 9 10			
<b>HC 7530</b>	HC-M30 HC-P30	HV 1350	CVD-TiAlN + Al <sub>2</sub> O <sub>3</sub> (+ ZrCN)	<b>Toughness</b>	—	●	●
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	—	●	●
				1 2 3 4 5 6 7 8 9 10			
<b>HC 7810</b>	HC-M10 HC-S10	HV 1820	PVD-TiAlN + Al <sub>2</sub> O <sub>3</sub> (+ ZrCN)	<b>Toughness</b>	●	●	—
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	●	—
				1 2 3 4 5 6 7 8 9 10			
<b>HC 7820</b>	HC-M20 HC-S20	HV 1520	PVD-TiAlN + Al <sub>2</sub> O <sub>3</sub> (+ ZrCN)	<b>Toughness</b>	●	●	●
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	●	●
				1 2 3 4 5 6 7 8 9 10			
<b>ACM20T</b>	HC-M20 HC-P30	HV 1470	CVD-TiCN + Al <sub>2</sub> O <sub>3</sub> (+ TiCN)	<b>Toughness</b>	●	●	—
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	●	—
				1 2 3 4 5 6 7 8 9 10			
<b>APM20T</b>	HC-M20 HC-K20	HV 1560	PVD, TiAlN, 2 - 5 µm	<b>Toughness</b>	●	—	—
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	—	—
				1 2 3 4 5 6 7 8 9 10			
<b>APM25T</b>	HC-P35 HC-M25	HV 1460	PVD, TiN / TiAlN, 6 µm	<b>Toughness</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	●	○	—
				1 2 3 4 5 6 7 8 9 10			
<b>APM35T</b>	HC-P35 HC-M35	HV 1330	PVD, TiN / TiAlN, 6 µm	<b>Toughness</b>	○	●	●
				1 2 3 4 5 6 7 8 9 10			
				<b>Wear resistance</b>	○	●	●
				1 2 3 4 5 6 7 8 9 10			



# ISO K

Indexable cutting inserts for the ISO-K area are mainly used for cast iron that can be forged (GG) and spheroidal graphite iron (GGG), as well as for cast iron with vermicular graphite and bainitic cast iron with spheroidal graphite iron.

Sort designation	ISO	Hardness	Coating	Toughness / Wear resistance	Continuous cut	Slightly interrupted cut	Significantly interrupted cut																																								
<b>ACK10T</b>	HC-K10 HC-P05	HV 1810	CVD-TiCN + Al <sub>2</sub> O <sub>3</sub>	<table border="1"> <tr><td colspan="10"><b>Toughness</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td colspan="10"><b>Wear resistance</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	<b>Toughness</b>										1	2	3	4	5	6	7	8	9	10	<b>Wear resistance</b>										1	2	3	4	5	6	7	8	9	10			
<b>Toughness</b>																																															
1	2	3	4	5	6	7	8	9	10																																						
<b>Wear resistance</b>																																															
1	2	3	4	5	6	7	8	9	10																																						
<b>ACK20T</b>	HC-P10 HC-K20	HV 1630	CVD, i(C,N)+Al <sub>2</sub> O <sub>3</sub> , 15,5 µm	<table border="1"> <tr><td colspan="10"><b>Toughness</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td colspan="10"><b>Wear resistance</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	<b>Toughness</b>										1	2	3	4	5	6	7	8	9	10	<b>Wear resistance</b>										1	2	3	4	5	6	7	8	9	10			
<b>Toughness</b>																																															
1	2	3	4	5	6	7	8	9	10																																						
<b>Wear resistance</b>																																															
1	2	3	4	5	6	7	8	9	10																																						

# ISO N

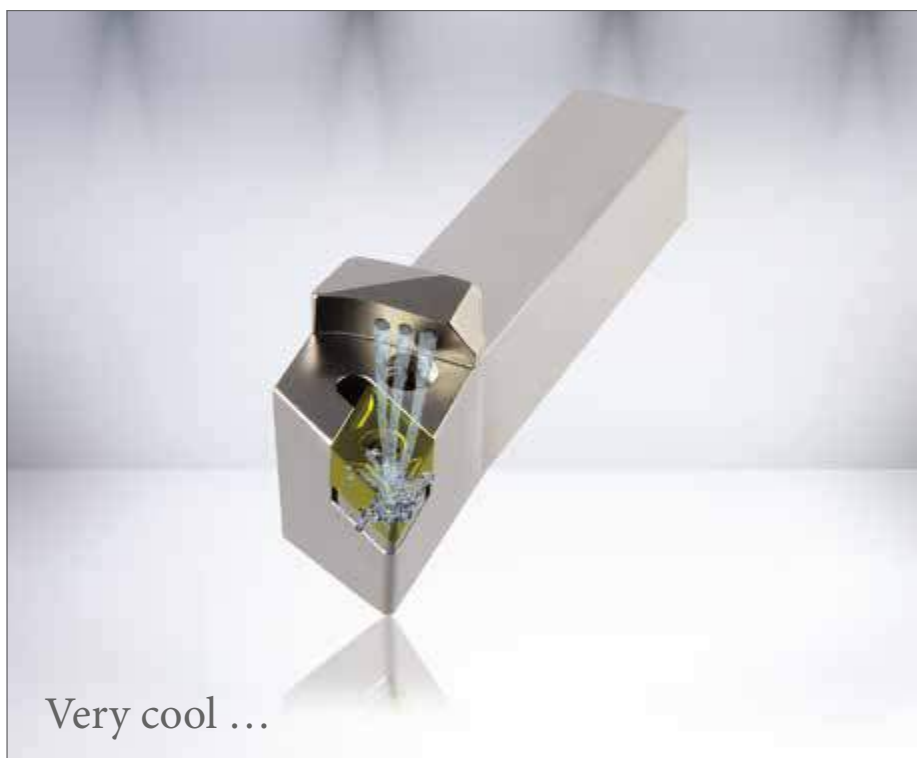
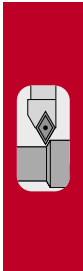
Indexable cutting inserts for the ISO-N area are mainly used in machining aluminium and aluminium alloys (cast and forgeable alloys) with an Si content <13%. Non-metallic materials such as thermosets and fibre-reinforced plastics can also be machined with this turning type.

Sort designation	ISO	Hardness	Coating	Toughness / Wear resistance	Continuous cut	Slightly interrupted cut	Significantly interrupted cut																																								
<b>HC 6310</b>	HC-N10	HV 1750	PVD-TiCN	<table border="1"> <tr><td colspan="10"><b>Toughness</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td colspan="10"><b>Wear resistance</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	<b>Toughness</b>										1	2	3	4	5	6	7	8	9	10	<b>Wear resistance</b>										1	2	3	4	5	6	7	8	9	10			
<b>Toughness</b>																																															
1	2	3	4	5	6	7	8	9	10																																						
<b>Wear resistance</b>																																															
1	2	3	4	5	6	7	8	9	10																																						
<b>AWN15T</b>	HW-K15	HV 1630		<table border="1"> <tr><td colspan="10"><b>Toughness</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td colspan="10"><b>Wear resistance</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	<b>Toughness</b>										1	2	3	4	5	6	7	8	9	10	<b>Wear resistance</b>										1	2	3	4	5	6	7	8	9	10			
<b>Toughness</b>																																															
1	2	3	4	5	6	7	8	9	10																																						
<b>Wear resistance</b>																																															
1	2	3	4	5	6	7	8	9	10																																						
<b>APN15T</b>	HW-K15	HV 1630	PVD, TiN/ TiAlN, 6 µm	<table border="1"> <tr><td colspan="10"><b>Toughness</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td colspan="10"><b>Wear resistance</b></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> </table>	<b>Toughness</b>										1	2	3	4	5	6	7	8	9	10	<b>Wear resistance</b>										1	2	3	4	5	6	7	8	9	10			
<b>Toughness</b>																																															
1	2	3	4	5	6	7	8	9	10																																						
<b>Wear resistance</b>																																															
1	2	3	4	5	6	7	8	9	10																																						

ISO  
**S**

Indexable cutting inserts for the ISO-S range are mainly used in machining highly heat-resistant alloys based on nickel-iron and cobalt. Titanium in its pure form or in alpha and beta alloys complete this ISO-S area. These materials which are extremely difficult to machine require a machining strategy adapted to the component which also depends on the machine.

Sort designation	ISO	Hardness	Coating	Toughness / Wear resistance	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
<b>APS10T</b>	HCM15 HC-S15	HV 1820	PVD (Ti, Al) N, 4 µm	<b>Toughness</b> 1 2 3 4 5 6 7 8 9 10	●	○	—
				<b>Wear resistance</b> 1 2 3 4 5 6 7 8 9 10			
<b>APS15T</b>	HCM15 HC-S15	HV 1820	PVD TiN + (Ti, Al) N + TiN, 4 µm	<b>Toughness</b> 1 2 3 4 5 6 7 8 9 10	●	○	—
				<b>Wear resistance</b> 1 2 3 4 5 6 7 8 9 10			
<b>APS40T</b>	HCM40 HC-S30	HV 1330	CVD TiN-TiB2 Multilayer	<b>Toughness</b> 1 2 3 4 5 6 7 8 9 10	○	●	●
				<b>Wear resistance</b> 1 2 3 4 5 6 7 8 9 10			



... with internal cooling.

Very cool ...

**ATORN**<sup>®</sup>  
Performance demands quality

# ATORN® Overview of positive chip breakers

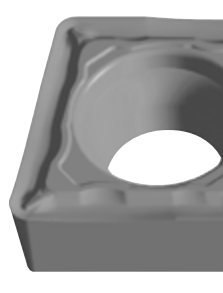
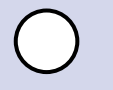


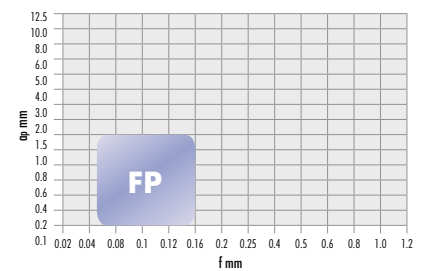


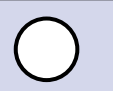


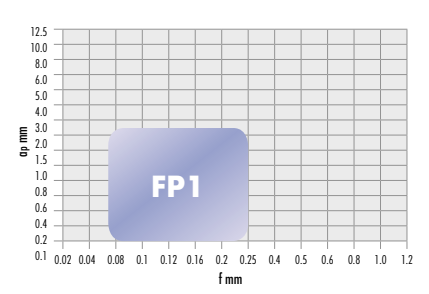

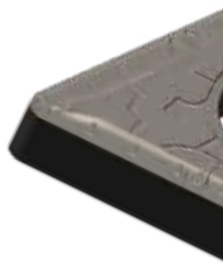
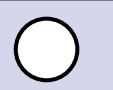


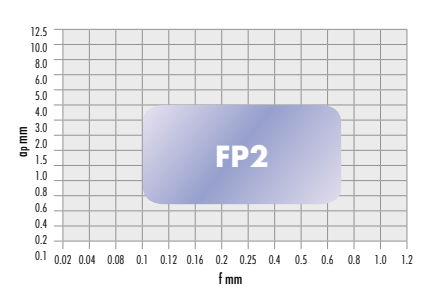

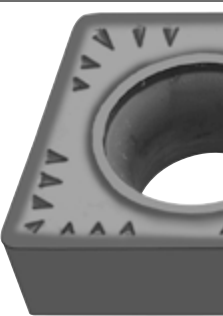
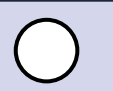


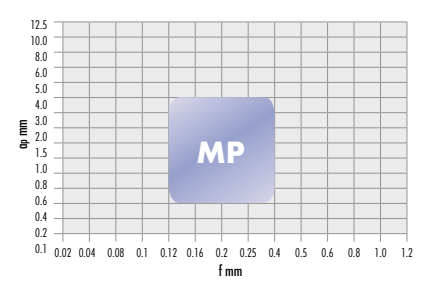

INFO





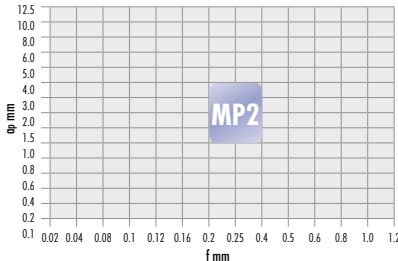



## The new chip breakers from the range for positive indexable cutting inserts (5° and 7°)





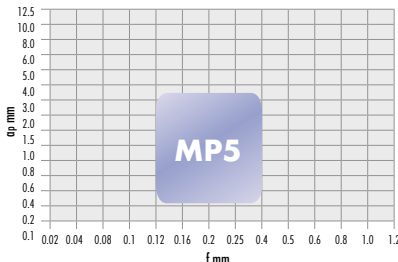



The newly calculated chip breakers for individual use have been adapted to users' needs. The guarantee of optimised chip breaking properties in daily use was the priority here.


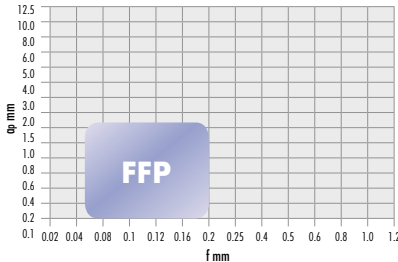




Adapted cutting edge preparation and enhanced surface treatment make the geometries even more efficient and more soft cutting. This is evident both in daily use and in series production as a result of an extended service life and lower machine loads. The latest insights in the development and modern cutting strategies of the individual ISO classes P, M, K, S and N were applied in the development of the chip breaker.


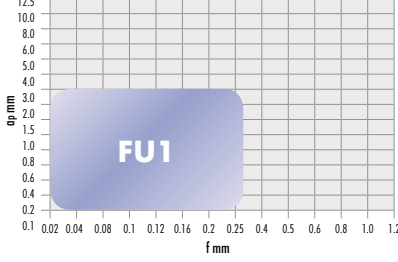




The benefits to the customer in terms of effectiveness, process reliability and material removal rate are the result. Elegant solutions are available for fine and ultra-fine finishing, medium machining and light roughing for positive geometries. The new TURN provides the best possible chip control even with small cutting depths and feeds, very good chip breaking properties even with exotic materials with a significantly reduced tendency to form burrs, and the best possible surface qualities.





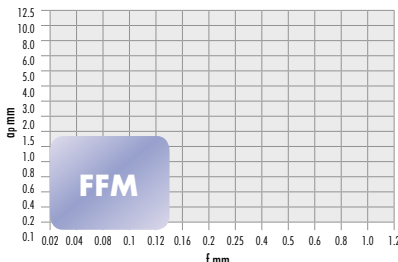

Chip breaker FP		ap	f	ISO P chip breaker, positive		
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>		0.1 - 1.5 mm	0.05 - 0.16 mm/rev			
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
			●	○	—	
Chip breaker FP1		ap	f	ISO P chip breaker, positive		
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker for best possible chip control</li> <li>• Soft chipping</li> </ul>		0.1 - 2.5 mm	0.07 - 0.25 mm/rev			
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
			●	○	—	
Chip breaker FP2		ap	f	ISO P chip breaker, positive/negative		
<ul style="list-style-type: none"> <li>• Maximum surface quality</li> <li>• Double feed possible with the same Ra</li> <li>• Soft cutting</li> <li>• Also for non-rusting materials</li> </ul>		0.5 - 4.0 mm	0.1 - 0.7 mm/rev			
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
			●	●	—	
Chip breaker MP		ap	f	ISO P chip breaker, positive		
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>		0.4 - 4.0 mm	0.12-0.4 mm/rev			
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
			●	●	○	

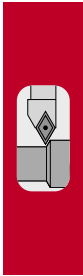
<b>Chip breaker MP2</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, positive</b>		
		1.0 - 4.0 mm	0.2 - 0.4 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						
				●	●	—

<b>Chip breaker MP5</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, positive</b>		
		0.25-3.5 mm	0.12-0.4 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						
				●	○	—





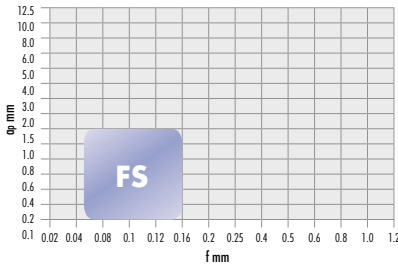



<b>Chip breaker FFP, CERMET version</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, positive</b>		
		0.1 - 1.65 mm	0.05 - 0.2 mm/rev	<b>ISO M chip breaker, positive</b>		
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• For best surface qualities</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
					—	—





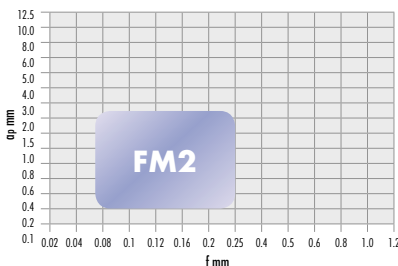



<b>Chip breaker FU1</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, positive</b>		
		0.1 - 3.0 mm	0.02 - 0.3 mm/rev	<b>ISO M chip breaker, positive</b>		
<ul style="list-style-type: none"> <li>• Optimised chip breaker for best possible chip control</li> <li>• Universal application</li> <li>• Long service life</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
					○	—





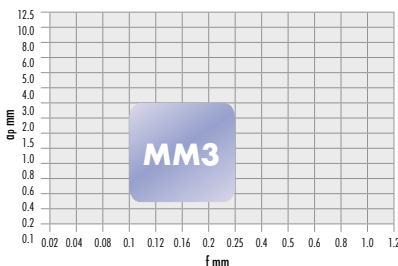



<b>Chip breaker FFM, version for stainless steel</b>		<b>ap</b>	<b>f</b>	<b>ISO M chip breaker, positive</b>		
		0.05 - 1.35 mm	0.02 - 0.14 mm/rev			
<ul style="list-style-type: none"> <li>• Special chip breaker for chrome-nickel steel and titanium machining</li> <li>• "Sharp" chip breaker</li> <li>• Soft chipping</li> <li>• Extremely good chip control</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
					—	—
				●	—	—





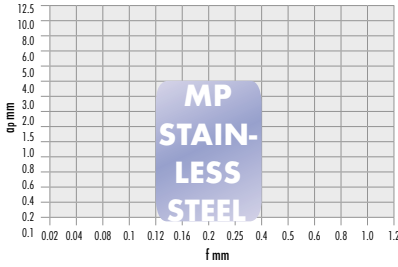









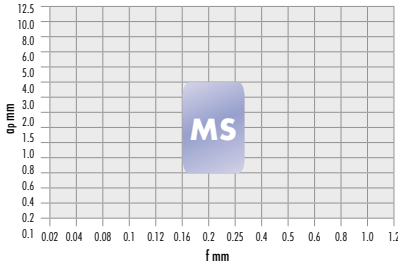









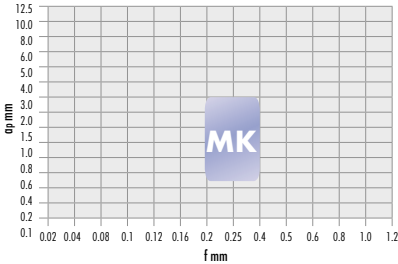



Chip breaker FS		ap	f	ISO M chip breaker, positive		
		0.1 - 1.5 mm	0.05 - 0.16 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Soft chipping</li> <li>• Universal application</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						





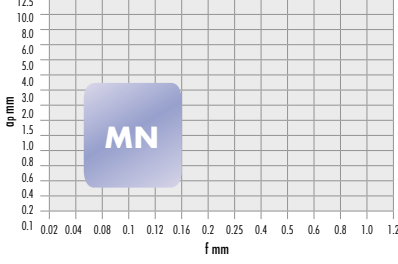



Chip breaker FM2		ap	f	ISO M chip breaker, positive		
		0.2 - 2.5 mm	0.07 - 0.25 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker for best possible chip control in stainless steel</li> <li>• Soft chipping</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						





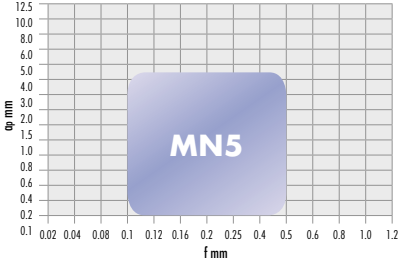



Chip breaker MM3		ap	f	ISO M chip breaker, positive		
		0.3 - 3.0 mm	0.1 - 0.25 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

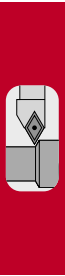
Chip breaker MP stainless steel		ap	f	ISO M chip breaker, positive		
		0.4 - 4.0 mm	0.12-0.4 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application in stainless steel</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

Chip breaker MS		ap	f	ISO M chip breaker, positive		
		0.6 - 4.0 mm	0.16 - 0.3 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application in stainless steel</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

Chip breaker MK		ap	f	ISO K chip breaker, positive		
		0.5 - 3.0 mm	0.2 - 0.4 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

Chip breaker MN		ap	f	ISO N chip breaker, positive		
		0.3 - 3.5 mm	0.05 - 0.16 mm/rev			
<ul style="list-style-type: none"> <li>• Chip breaker for aluminium machining</li> <li>• Also suitable for plastics and non-ferrous metals</li> <li>• High rake angle</li> <li>• Also suitable for austenitic quenched steel up to a chip depth of 0.4 mm</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

Chip breaker MN5		ap	f	ISO N chip breaker, positive		
		0.1 - 4.5 mm	0.1 - 0.5 mm/rev			
<ul style="list-style-type: none"> <li>• Chip breaker for aluminium machining</li> <li>• Also suitable for plastics and non-ferrous metals</li> <li>• High rake angle</li> <li>• Also suitable for austenitic quenched steel up to a chip depth of 0.4 mm</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						



# ATORN® Overview of negative chip breakers





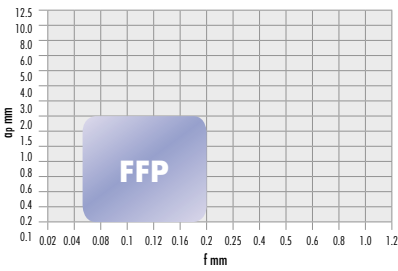



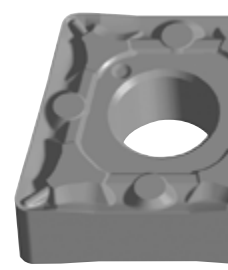



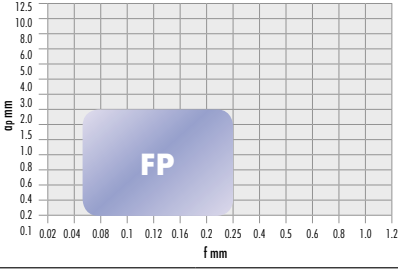



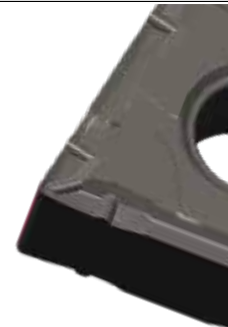



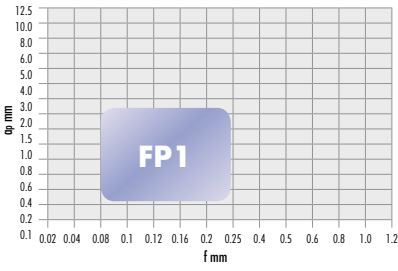



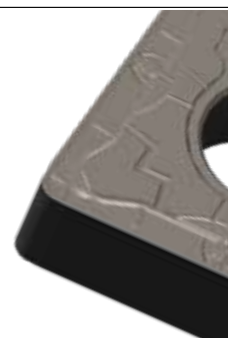



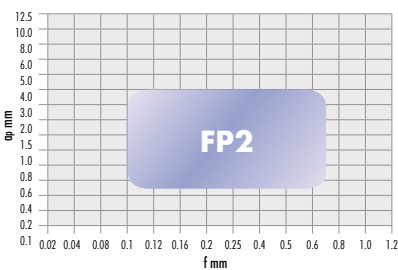



INFO





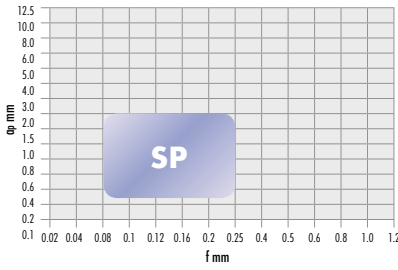






## The new chip breakers from the range for negative indexable cutting inserts (0°)




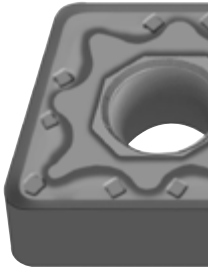
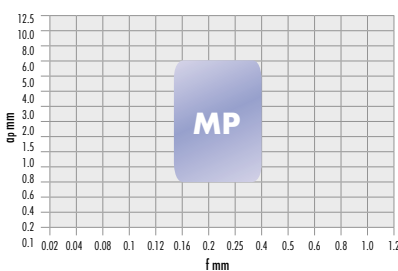






The newly calculated chip breakers for individual use have been adapted to users' needs. The guarantee of optimised chip breaking properties in daily use was the priority here.





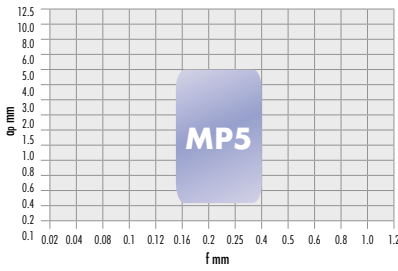






Adapted cutting edge preparation and enhanced surface treatment make the geometries even more efficient and more soft cutting. This is evident both in daily use and in series production as a result of an extended service life and lower machine loads. The latest insights in the development and modern cutting strategies of the individual ISO classes P, M, K, S and N were applied in the development of the chip breaker.





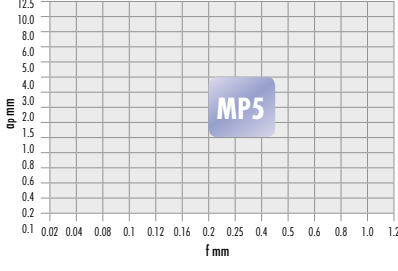






The benefits to the customer in terms of effectiveness, process reliability and material removal rate are the result. Elegant solutions are available for fine and ultra-fine finishing, medium machining and light roughing for negative geometries. The new TURN provides the best possible chip control even with small cutting depths and feeds, very good chip breaking properties even with exotic materials with a significantly reduced tendency to form burrs, and the best possible surface qualities.





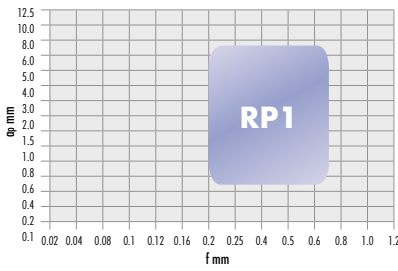






Chip breaker FFP, CERMET version		ap	f	ISO P chip breaker, negative			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• For best surface qualities</li> </ul>		0.1 - 2.0 mm	0.05 - 0.2 mm/rev				
			Continuous cut	Slightly interrupted cut	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
							
Chip breaker FP		ap	f	ISO P chip breaker, negative			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>		0.1 - 2.0 mm	0.05 - 0.25 mm/rev				
			Continuous cut	Slightly interrupted cut	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
							
Chip breaker FP1		ap	f	ISO P chip breaker, negative			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker for best possible chip control</li> <li>• Soft chipping</li> </ul>		0.25 - 2.4 mm	0.08 - 0.24 mm/rev				
			Continuous cut	Slightly interrupted cut	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
							
Chip breaker FP2		ap	f	ISO P chip breaker, positive/negative			
<ul style="list-style-type: none"> <li>• Maximum surface quality</li> <li>• Double feed possible with the same Ra</li> <li>• Soft cutting</li> <li>• Also for non-rusting materials</li> </ul>		0.5 - 4.0 mm	0.1 - 0.7 mm/rev				
			Continuous cut	Slightly interrupted cut	Continuous cut	Slightly interrupted cut	Significantly interrupted cut
							

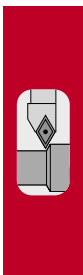
Chip breaker SP		ap	f	ISO P chip breaker, negative		
		0.3 - 2.0 mm	0.08 - 0.25 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Soft chipping</li> <li>• Universal application</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


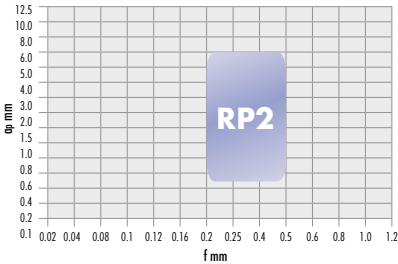






Chip breaker MP		ap	f	ISO P chip breaker, negative		
		0.6 - 6.0 mm	0.15-0.4 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


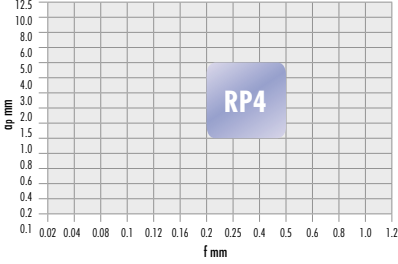






Chip breaker MP5		ap	f	ISO P chip breaker, negative		
		0.25-5 mm	0.15-0.4 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


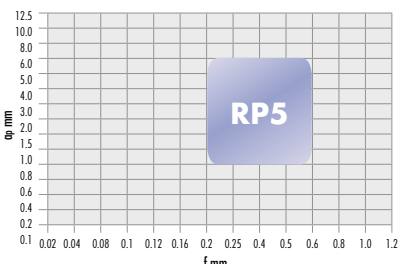






Chip breaker MP5-HP		ap	f	ISO P chip breaker, negative		
		1.0 - 4.0 mm	0.2 - 0.45 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

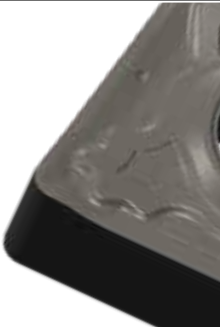
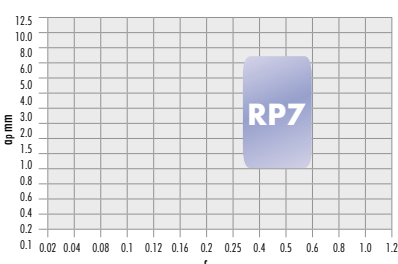






Chip breaker RP1		ap	f	ISO P chip breaker, negative		
		0.5 - 7.5 mm	0.2 - 0.7 mm/rev			
<ul style="list-style-type: none"> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Improved cutting edge stability, prevents notching effect and notch impact</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


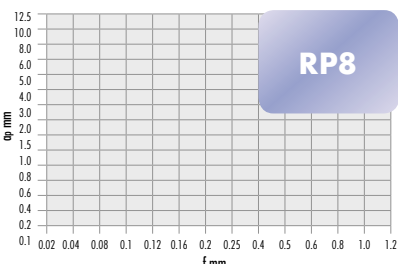









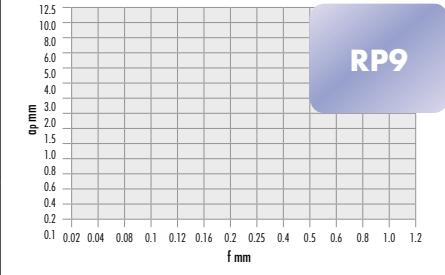






<b>Chip breaker RP2</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		0.5 - 6 mm	0.2 - 0.5 mm/rev			
<ul style="list-style-type: none"> <li>Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>Improved cutting edge stability, prevents notching effect and notch impact</li> <li>Stabilised contact surfaces</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


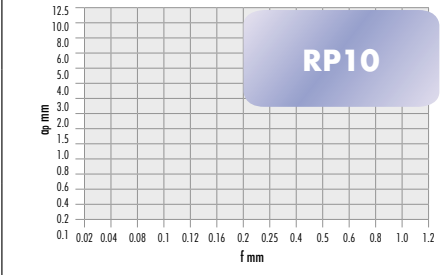






<b>Chip breaker RP4</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		1.0 - 5.0 mm	0.2 - 0.5 mm/rev			
<ul style="list-style-type: none"> <li>Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>Improved cutting edge stability, prevents notching effect and notch impact</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


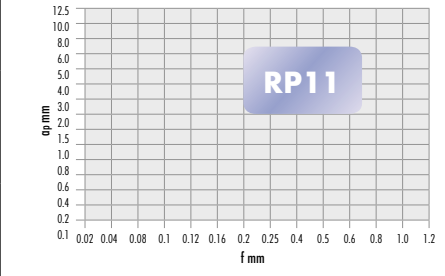






<b>Chip breaker RP5</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		0.8 - 6.0 mm	0.2 - 0.6 mm/rev			
<ul style="list-style-type: none"> <li>for medium to coarse machining</li> <li>Chip breaker for difficult cuts</li> <li>For universal applications</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


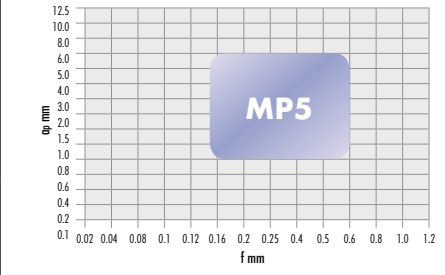






<b>Chip breaker RP7</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		0.8 - 7.0 mm	0.3 - 0.6 mm/rev			
<ul style="list-style-type: none"> <li>One-sided chip breaker</li> <li>Maximum machining reliability</li> <li>Chip breaker for difficult cuts</li> <li>Increased cutting force, temperature and vibration tendency</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


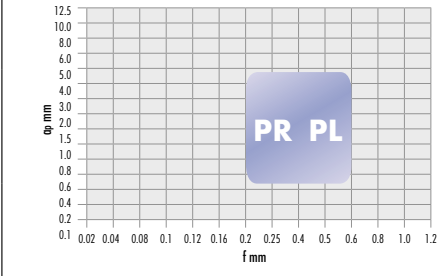






<b>Chip breaker RP8</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		2.5 - 13 mm	0.4 - 1.3 mm/rev			
<ul style="list-style-type: none"> <li>One-sided chip breaker</li> <li>Maximum machining reliability</li> <li>Chip breaker for difficult cuts</li> <li>Increased cutting force, temperature and vibration tendency</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

<b>Chip breaker RP9</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		2.0 - 13 mm	0.5 - 1.5 mm/rev			
<ul style="list-style-type: none"> <li>• One-sided chip breaker</li> <li>• Maximum machining reliability</li> <li>• Chip breaker for difficult cuts</li> <li>• Increased cutting force, temperature and vibration tendency</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

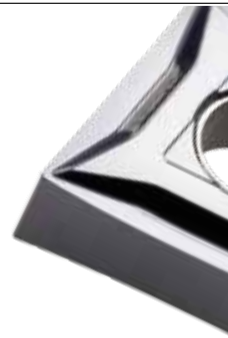
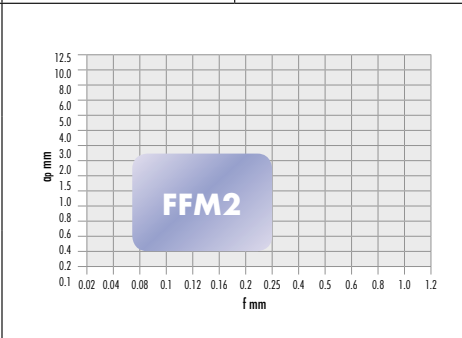



<b>Chip breaker RP10</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		2.5 - 12 mm	0.2 - 1.3 mm/rev			
<ul style="list-style-type: none"> <li>• One-sided chip breaker</li> <li>• Maximum machining reliability</li> <li>• Chip breaker for difficult cuts</li> <li>• Reduced cutting force, temperature and vibration tendency</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


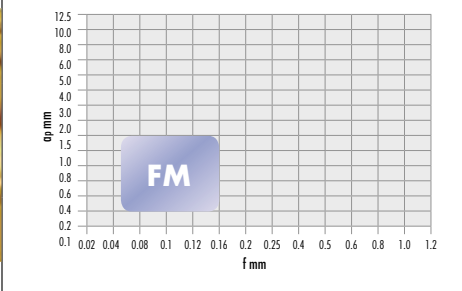



<b>Chip breaker RP11</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		2.0 - 7.0 mm	0.2 - 0.7 mm/rev			
<ul style="list-style-type: none"> <li>• One-sided chip breaker</li> <li>• Maximum machining reliability</li> <li>• Increased cutting force, temperature and vibration tendency</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


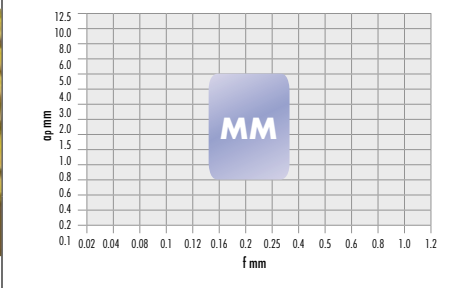



<b>Chip breaker MP5</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		0.8 - 6 mm	0.15 - 0.6 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


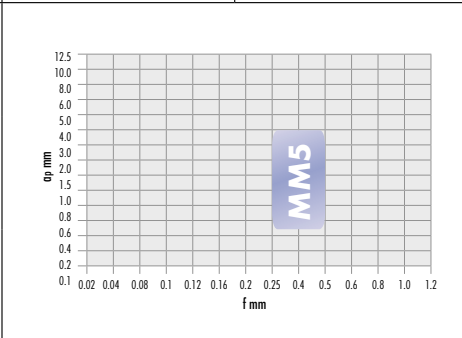



<b>Chip breaker PR and PL</b>		<b>ap</b>	<b>f</b>	<b>ISO P chip breaker, negative</b>		
		0.5 - 4.8 mm	0.2 - 0.6 mm/rev	<b>ISO M chip breaker, negative</b>		
<ul style="list-style-type: none"> <li>• Soft chipping</li> <li>• "Sharp" cutting edge</li> <li>• Universal application</li> <li>• Established chip level</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						


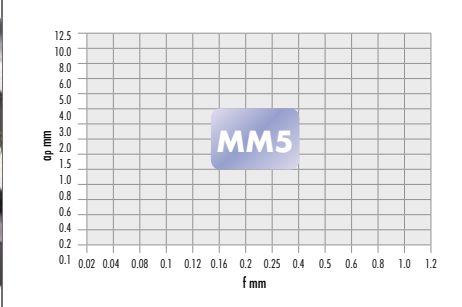





<b>Chip breaker FFM2</b>		<b>ap</b> 0.2 - 2.5 mm	<b>f</b> 0.07 - 0.25 mm/rev	<b>ISO M chip breaker, negative</b>		
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• For best surface qualities</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
				●	—	—


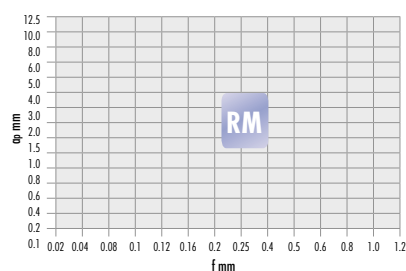






<b>Chip breaker FM</b>		<b>ap</b> 0.3 - 9.0 mm	<b>f</b> 0.1 - 0.6 mm/rev	<b>ISO M chip breaker, negative</b>		
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• For best surface quality</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
				●	○	—


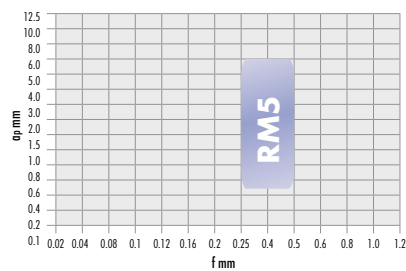





<b>Chip breaker MM</b>		<b>ap</b> 0.6 - 5.0 mm	<b>f</b> 0.15 - 0.35 mm/rev	<b>ISO M chip breaker, negative</b>		
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Low cutting forces</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
				●	●	○


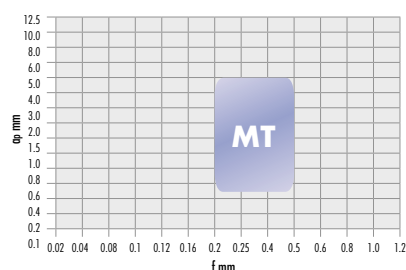






<b>Chip breaker MM5</b>		<b>ap</b> 0.5 - 4.0 mm	<b>f</b> 0.25 - 0.5 mm/rev	<b>ISO M chip breaker, negative</b>		
<ul style="list-style-type: none"> <li>• Specially developed for low cutting forces</li> <li>• Optimised chip breaker to prevent burr formation</li> <li>• For best surface qualities</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
				●	●	—


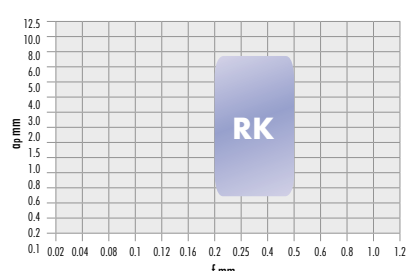






<b>Chip breaker MM5-HP</b>		<b>ap</b> 1.0 - 4.0 mm	<b>f</b> 0.15-0.4 mm/rev	<b>ISO M chip breaker, negative</b>		
<ul style="list-style-type: none"> <li>• Specially developed for low cutting forces</li> <li>• Optimised chip breaker to prevent burr formation</li> <li>• For best surface qualities</li> </ul>						
				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
				●	○	—


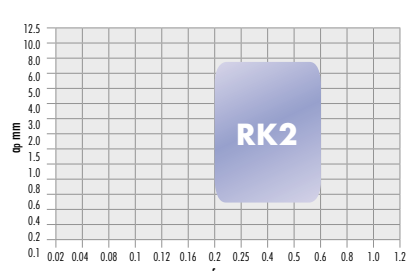








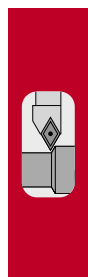
<b>Chip breaker RM</b>		<b>ap</b>	<b>f</b>	<b>ISO M chip breaker, negative</b>		
		1.2 - 4.0 mm	0.22 - 0.4 mm/rev			
<ul style="list-style-type: none"> <li>• for medium to coarse machining</li> <li>• Chip breaker for difficult cuts</li> </ul>						
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
						





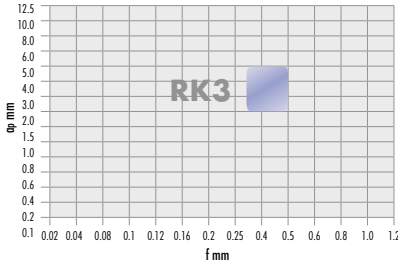



<b>Chip breaker RM5</b>		<b>ap</b>	<b>f</b>	<b>ISO M chip breaker, negative</b>		
		0.5 - 6.0 mm	0.25 - 0.5 mm/rev			
<ul style="list-style-type: none"> <li>• Specially developed for low cutting forces</li> <li>• Optimised chip breaker to prevent burr formation</li> <li>• For best surface qualities</li> <li>• For light to medium roughing</li> </ul>						
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
					-	





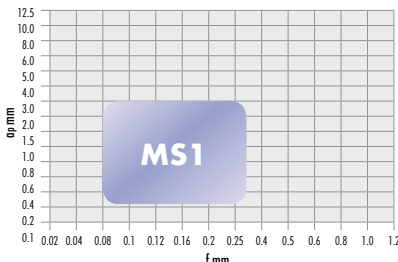



<b>Chip breaker MK</b>		<b>ap</b>	<b>f</b>	<b>ISO K chip breaker, negative</b>		
		0.5 - 5.0 mm	0.2 - 0.5 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>						
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
						





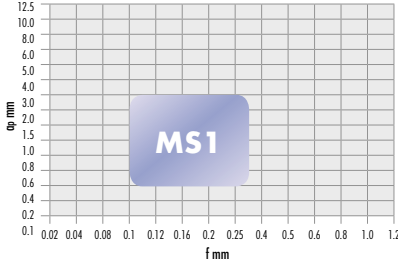



<b>Chip breaker RK</b>		<b>ap</b>	<b>f</b>	<b>ISO K chip breaker, negative</b>		
		0.5 - 7.5 mm	0.2 - 0.5 mm/rev			
<ul style="list-style-type: none"> <li>• Prevents crack formation and is temperature-resistant</li> <li>• Universal application</li> </ul>						
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
						





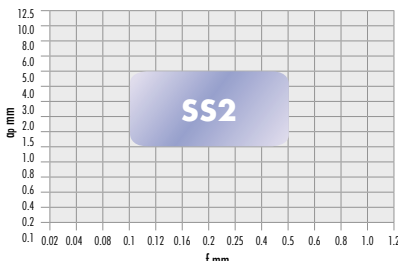



<b>Chip breaker RK2</b>		<b>ap</b>	<b>f</b>	<b>ISO K chip breaker, negative</b>		
		0.5 - 7.5 mm	0.2 - 0.6 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Light to medium roughing work</li> </ul>						
			Continuous cut	Slightly interrupted cut	Significantly interrupted cut	
						



Chip breaker RK3		ap	f	ISO K chip breaker, negative		
		2.0 - 5.0 mm	0.3 - 0.5 mm/rev			
<ul style="list-style-type: none"> <li>• Long service life</li> <li>• Optimised chip breaker prevents crack formation and is temperature-resistant</li> <li>• Light to medium roughing work</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

Chip breaker MS1		ap	f	ISO S chip breaker, negative		
		0.25 - 3.0 mm	0.08 - 0.3 mm/rev			
<ul style="list-style-type: none"> <li>• Especially for chrome-nickel steel</li> <li>• Soft chipping</li> <li>• "Sharp" cutting edge</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

Chip breaker MS1-HP		ap	f	ISO S chip breaker, negative		
		0.4 - 3.0 mm	0.1 - 0.3 mm/rev			
<ul style="list-style-type: none"> <li>• Especially for chrome-nickel steel</li> <li>• Soft chipping</li> <li>• Sharp cutting edge</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

Chip breaker SS2		ap	f	ISO S chip breaker, negative		
		1.0 - 5.0 mm	0.1 - 0.5 mm/rev			
<ul style="list-style-type: none"> <li>• Especially for chrome-nickel steel</li> <li>• Soft chipping</li> <li>• "Sharp" cutting edge</li> <li>• for medium to coarse machining</li> </ul>				Continuous cut	Slightly interrupted cut	Significantly interrupted cut
						

## ATORN® Technical information ISO indexable cutting inserts

### Choice of carbide quality

ISO	Carbide quality	ISO range	Material	Recommended application area
P	HC7610	P01-P20 K15-K25	Steel, grey cast iron and spheroidal graphite iron	Ultra wear-resistant type for small to medium chip cross sections, high cutting speeds under good conditions
	HC7620	P10-P30 K25-K35	Steel, grey cast iron and spheroidal graphite iron	Wear-resistant type for medium to large chip cross sections, medium to high cutting speeds under good to average conditions
	HC7630 HC7640	P20-P40 P25-P50	Steel	Very tough type for medium to large chip cross sections, medium cutting speeds under average to poor conditions, interrupted cutting
	M	HC7510	M01-M20 P15-P25	Stainless, non-austenitic steel and steel
HC7520		M10-M30 S15-S25	Stainless, non-austenitic steel and materials that are difficult to machine	Wear-resistant type for medium to large chip cross sections, medium to high cutting speeds under good to average conditions.
HC7530		M20-M40 S25-S35	Stainless, austenitic, superaustenitic and duplex steel, as well as materials that are difficult to machine	Very tough type for medium to large chip cross sections, medium cutting speeds under average and poor conditions
K	HC6410	K05-K15 H25-H35	Grey cast iron and spheroidal graphite iron	Wear-resistant type for medium to large chip cross sections, medium to high cutting speeds under good to average conditions
N	HC6310	N05-N15 M00-M0	Aluminium alloys, copper and copper alloys as well as non-metallic materials and stainless austenitic steel	Wear-resistant type for small to medium chip cross sections, high cutting speeds under good conditions
	HW6310	N05-N15	Aluminium alloys, copper and copper alloys as well as non-metallic materials	Wear-resistant type for small to medium chip cross sections, high cutting speeds under good conditions
S	HC7220	M10-M30 S10-S30	Stainless, non-austenitic steel and materials that are difficult to machine	Wear-resistant type for medium to large chip cross sections, medium to high cutting speeds under good to average conditions

### Choice of geometry

ISO	Material	Machining	Clamp depth mm	Feed mm/rev	Recommended geometry Negative indexable cutting insert	Recommended geometry Positive indexable cutting insert
P	Steel ISO P1 - P13*	Finishing	0.5 - 2	0.1 - 0.3	FP	FP / SP
		Medium machining	1.5 - 5	0.2 - 0.5	MP	FP / SP
		Roughing	5 - 15	0.5-1.5	RP	
M	Stainless steel ISO M14*	Finishing	0.5 - 2	0.1 - 0.3	FM	SM
		Medium machining	1.5 - 5	0.2 - 0.5	MM	MP / SM
		Roughing	5 - 15	0.5-1.5	RM	
K	Cast iron ISO K15 - N20*	Finishing	0.5 - 2	0.1 - 0.3	MP / MT	MP / MT
		Medium machining	1.5 - 5	0.2 - 0.5	RP / MT	MP / MT
		Roughing	5 - 15	0.5-1.5	RP	
N	Non-ferrous metals ISO N21 - N30*	Finishing	0.5 - 2	0.1 - 0.3		MN
		Medium machining	1.5 - 5	0.2 - 0.5		MN
		Roughing	5 - 15	0.5-1.5		
S	Materials that are difficult to machine ISO S31 - S37*	Finishing	0.5 - 2	0.1 - 0.3	FM	SM
		Medium machining	1.5 - 5	0.2 - 0.5	MM	MP / SM
		Roughing	5 - 15	0.5-1.5	RM	
* Machining groups according to VDI Guideline 3323						
Other influences	Interrupted cutting				RP	MP
	Vibration tendency				FP / FM	FP / SP / SM
	Robust machine				FP / FM	FP / SP / SM
	Copying tasks				FP / MP / FM / MM	FP / MP / SP

## palbit Cutting data recommendations CBN

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	f mm/U
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	50-300	0,05 - 0,3
H	Hardened materials up to 64 HRC		T00Cr6	1.2067	70-180	0,05 - 0,3

## palbit Cutting data recommendations PKD

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	f mm/U
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	800 - 3000	0,05 - 0,3
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	800 - 3000	0,05 - 0,3
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	700 - 1500	0,05 - 0,3
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	700 - 1500	0,05 - 0,3
	Fibre-reinforced plastics		CFK, GFK		300 - 2000	0,05 - 0,3
	Graphite		C8000		300 - 2000	0,05 - 0,3

## Vibration-dampened boring bars

### Selecting the right indexable cutting insert

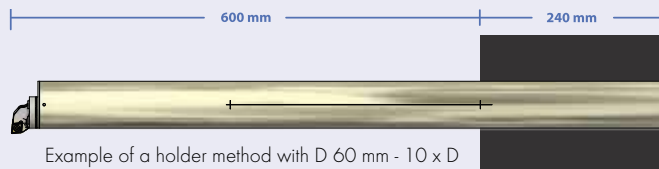
Selecting the right insert can have a major positive impact when machining with vibration-dampened boring bars. The indexable cutting insert can improve machining stability by minimising cutting forces.

- Where possible, always use the shortest tool length.
- To reduce radial forces to a minimum, ensure the entry angle is as close to 90° as possible.

- To reduce the total cutting force, select the smallest possible indexable cutting insert angle.
- To reduce the cutting forces, select the smallest possible corner radius.
- The machining depth ( $a_p$ ) should be greater than the corner radius of the indexable cutting insert.
- If possible, use an indexable cutting insert with a positive geometry to reduce the cutting pressure.

### Clamping the boring bar Overhang and clamping length

Vibration-dampened boring bars have a defined overhang and a defined clamping length. For a 60 mm boring bar with an overhang length of 10 x D, the total length of 840 mm incl. holding fixtures is divided as shown here. If the boring bar reaches beyond the specified overhang length, dampener operation is no longer fully guaranteed. A clamping length that is too short will produce the same result. It is important for the function of the boring bar that the specified parameters are observed.



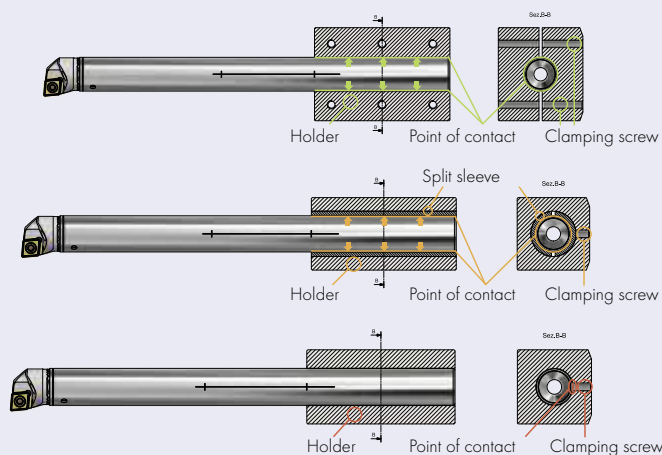
### Clamping of vibration-dampened boring bars

The clamping length of vibration-dampened boring bars should be no less than 4 x D.

Many clamping systems offer the option of slotted boring bar holders for full wrap-around clamping. Unfortunately, these systems often lack the necessary clamping length or a suitable diameter. In such cases, slotted clamping sleeves are used. These reduce to the required diameter and generally increase the clamping length.

Another option is to clamp using a split bushing in a boring bar holder. In this case, the boring bar is clamped over the bushing and the bushing completely encircles the boring bar. The three clamping screws on the boring bar holder clamp the full bushing, thus achieving good rigidity.

Where possible, do not use a boring bar holder without a bushing. If the boring bar is locked using only one screw there is only one point of contact, resulting in very poor rigidity. In addition, the screw can damage the surface of the boring bar and this makes positioning more difficult.



### Minimum and maximum overhang

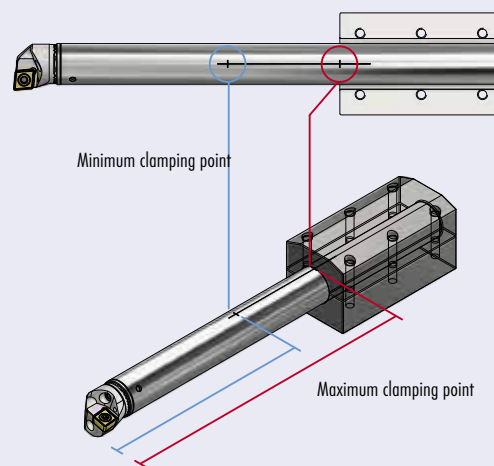
Vibration-dampened boring bars have two markings at 90° angles to the central axis. These mark the minimum and maximum overhang.

5 x D		
Ø mm	Min.	Max.
20	40	100
25	45	125
32	52	160
40	72	200
50	82	250
60	92	300

8 x D		
Ø mm	Min.	Max.
20	105	160
25	120	250
32	142	256
40	180	320
50	215	400
60	247	480

10 x D		
Ø mm	Min.	Max.
20	120	200
25	140	250
32	165	320
40	200	400
50	245	500
60	280	600

12 x D		
Ø mm	Min.	Max.
20	135	240
25	159	300
32	188	384
40	215	480
50	270	600
60	325	720



14 x D		
Ø mm	Min.	Max.
20	152	280
25	281	350
32	216	488

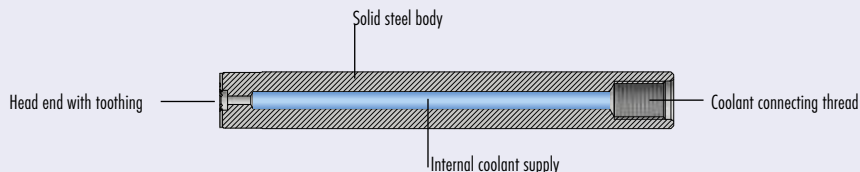
# Vibration-dampened boring bars

INFO

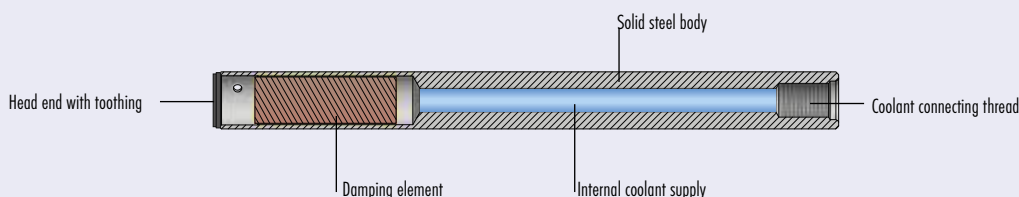
## Design of boring bars

Design types of conventional boring bars and boring bars with vibration-dampening elements

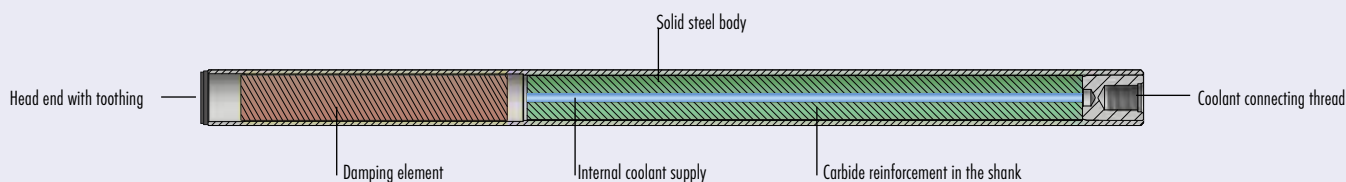
### Conventional steel boring bars with internal coolant feed



### Vibration-dampened boring bars with internal coolant feed



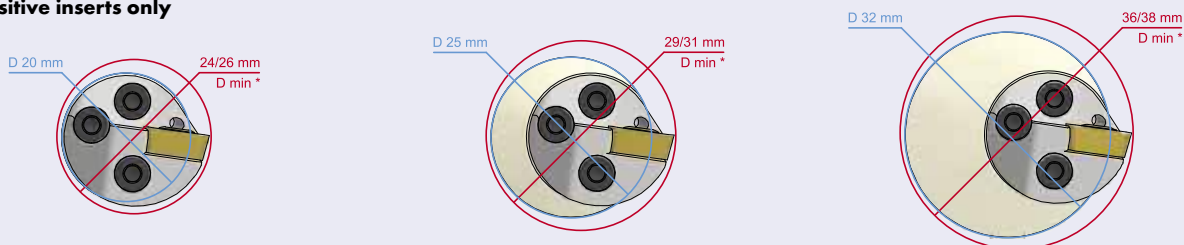
### Vibration-dampened boring bars with carbide-reinforced shank and internal coolant feed



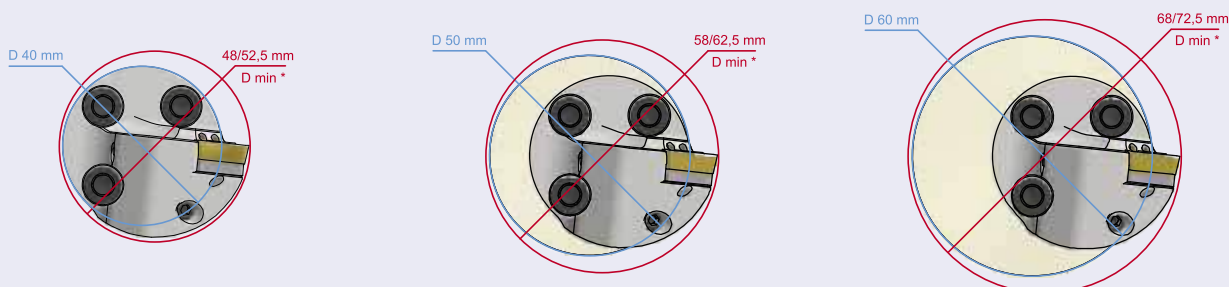
## Available space in the bore

The different boring bar diameters result in different spatial conditions in the machine or in the component. In order to ensure an optimum result, it is important to take into account the resulting chip volume and the available space in the bore and, where necessary, reconsider the geometry of the selected insert or version. Poor results are often due to insufficient space in the bore.

### QC20: positive inserts only



### DM40: positive and negative inserts



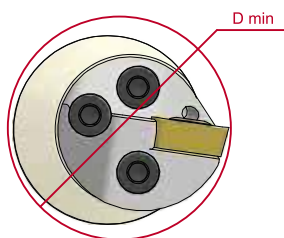
\* The minimum diameter depends on the holding fixtures.

## Vibration-dampened boring bars

INFO

### Minimum diameter of the existing bore hole

The minimum diameter is dependent on the choice of boring bar in conjunction with the boring head used.



### System QC-20

	D min / mm		
	Boring bars - Ø 20	Boring bars - Ø 25	Boring bars - Ø 32
A20-SCLC-R/L 09	24	29	36
A20-SDNC-R/L 11	26	31	38
A20-SDQC-R/L 07	24	29	36
A20-SDQC-R/L 11	26	31	38
A20-SDUC-R/L 07	24	29	36
A20-SDUC-R/L 11	26	31	38
A20-SDXC-R/L 11	26	31	38
A20-SIR/L-16	26	31	38
A20-STUC-R/L 11	24	29	36
A20-STUC-R/L 11 small	22	27	39
A20-STUC-R/L 16	26	31	38
A20-SVUC-R/L 11	26	31	38

### System DM-40

	D min / mm		
	Boring bars - Ø 40	Boring bars - Ø 50	Boring bars - Ø 60
A40-DLCN-R/L 12	48	58	68
A40-DLCN-R/L 16	48	58	68
A40-DLCN-R/L 19	48	58	68
A40-DDQN-R/L 15	48	58	68
A40-DDUN-R/L 15	48	58	68
A40-DIR/L-16	48	58	68
A40-DIR/L-16U	48	58	68
A40-DIR/L-22	48	58	68
A40-DIR/L-22U	48	58	68
A40-DTUN-R/L 16	42	52	62
A40-DTUN-R/L 16 small	42	52	62
A40-DTUN-R/L 22	48	58	68
A40-DVUN-R/L 16	48	58	68
A40-DWLN-R/L 08	48	58	68
A40-SCLC-R/L 12	49	59	69
A40-SDQC-R/L 11	48	58	68
A40-SDUC-R/L 11	49	59	69
A40-SDUC-R/L 15	48	58	68
A40-STUC-R/L 16	49	59	69
A40-STUC-R/L 16 small	49	59	69
A40-SVUC-R/L 11	49	59	69
A40-SVUC-R/L 16	49	59	69

## Designations and formulae (turning)

INFO

<b>D<sub>c</sub></b>	Cutting diameter	mm
<b>a<sub>e</sub></b>	Radial cutting width	mm
<b>a<sub>p</sub></b>	Axial cutting depth	mm
<b>f</b>	Feed per revolution	mm/rev
<b>f<sub>z</sub></b>	Feed per tooth	mm/rev

<b>V<sub>c</sub></b>	Cutting speed	m/min.
<b>Q</b>	Material removal rate	cm <sup>3</sup> /min.
<b>V<sub>f</sub></b>	Feed rate	m/min.
<b>z<sub>n</sub></b>	Number of cutting corners in the tool	
<b>n</b>	Rotational speed	rpm

<b>Cutting speed</b>	$V_c = \frac{\pi \times D_c \times n}{1000} = \text{m/min.}$
<b>Feed</b>	$V_f = f_z \times n \times z_n = \text{mm/min.}$
<b>Feed per revolution</b>	$f_n = \frac{V_f}{n} = \text{mm/U}$

<b>Rotational speed</b>	$n = \frac{V_c \times 1000}{\pi \times D_c} = \text{U/min.}$
<b>Material removal rate</b>	$Q = \frac{a_p \times a_e \times V_f}{1000} = \text{cm}^3/\text{min.}$

## ATORN® Technical information

### Improved chip control

- Replace worn cutting inserts
- Select more suitable chip control form
- Use neutral cutting insert
- Check perpendicular setting of the cutter holder
- Supply ample coolant
- Increase feed
- Temporarily suspend feed upon contact with the workpiece to allow the chips to pass into the chip guide.

### Eliminating rattling

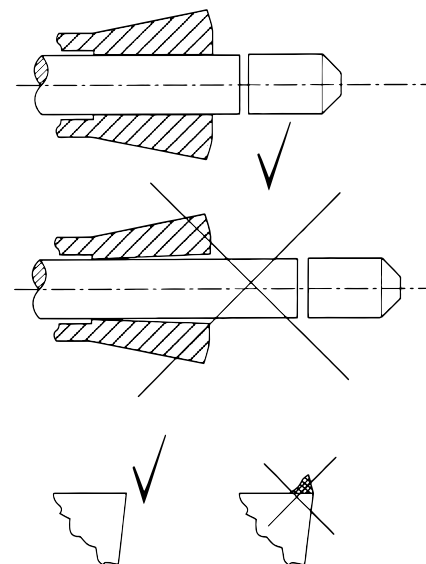
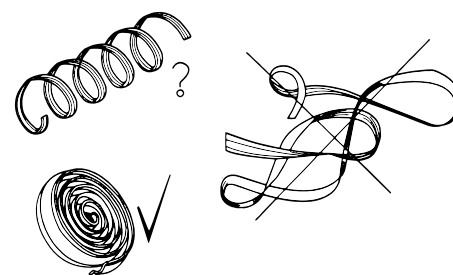
- Part-off as closely as possible to the chuck, minimise cutter holder overhang
- Check clamping and tool structure
- Change rotational speed
- Increase feed
- Block support in conventional lathes

### Prevention of bevel breakages

- Select suitable carbide type and cutting insert geometry
- Use cutting insert with larger corner radii
- Prevent rattle
- Avoid feed jerk at the end of the cutting procedure, possibly using a solid jerk limiter
- The fluid in the lathe hydraulic system must be 100% free of air bubbles
- Reduce the formation of built-up edges (to identify built-up edges as a reason for nicks, interrupt cutting and check cutting edge)

### Prevention or reduction of built-up edges

- Select suitable carbide type and cutting insert geometry
- Increase cutting speed
- Ensure sufficient cooling, recommendation: oil-based coolant



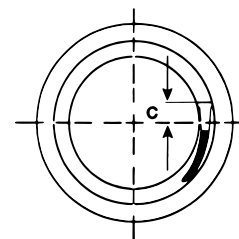
## Axial grooving and hollow drilling

### Application

Right cutting inserts should only be used in right-hand tools; left cutting inserts should only be used in left-hand tools. The cutting speed for axial grooving should be just 80% of the cutting speed for parting-off. The feed rate should be reduced to 50%.

Use plenty of coolant, aim coolant spray directly on the kerf.

- For compact holders and for the clamping shank / cutter holder combination, the dimension C described in the adjacent illustration must be integrated into the tool.



### Expanding the groove (ramping)

- First make groove in the largest-possible diameter range of the workpiece
- Immediately continue with the overlapping grooving. Thus the smallest machining diameter is dictated by the cutting insert design (see illustration). The maximum diameter is unlimited.
- A cutting insert width of  $0.9 \times W$  is recommended for overlapping cuts.
- A clamp depth of no more than  $0.1 \times$  cutting insert width is recommended for the face finish-turning of the ramping.

### Cutting out

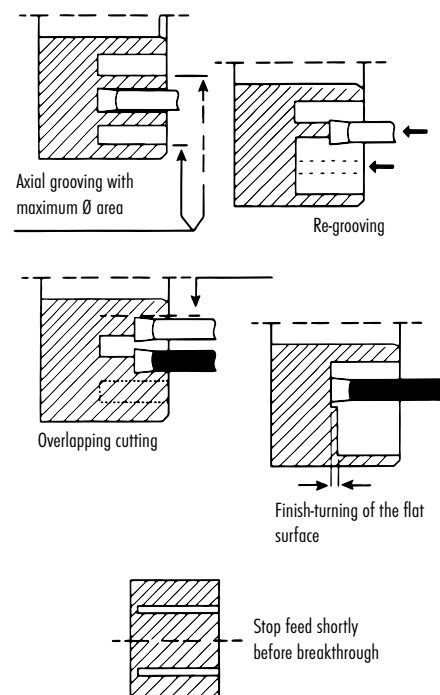
- To prevent tool damage caused by a loose core, stop feed briefly before breakthrough and penetrate the core with a plastic hammer.

### Precautionary measures

Carrier tools may not grate on the workpiece.

We recommend the following precautionary measures:

- Please observe the machining diameter of the tools. Grooves should only be made within this area.
- Align tool holder precisely with feed axis.
- For initial grooving with a new structure, stop feed at 1.5 mm punching depth and inspect. If there is friction, check tool height setting.
- Do not use worn or chipped cutting inserts





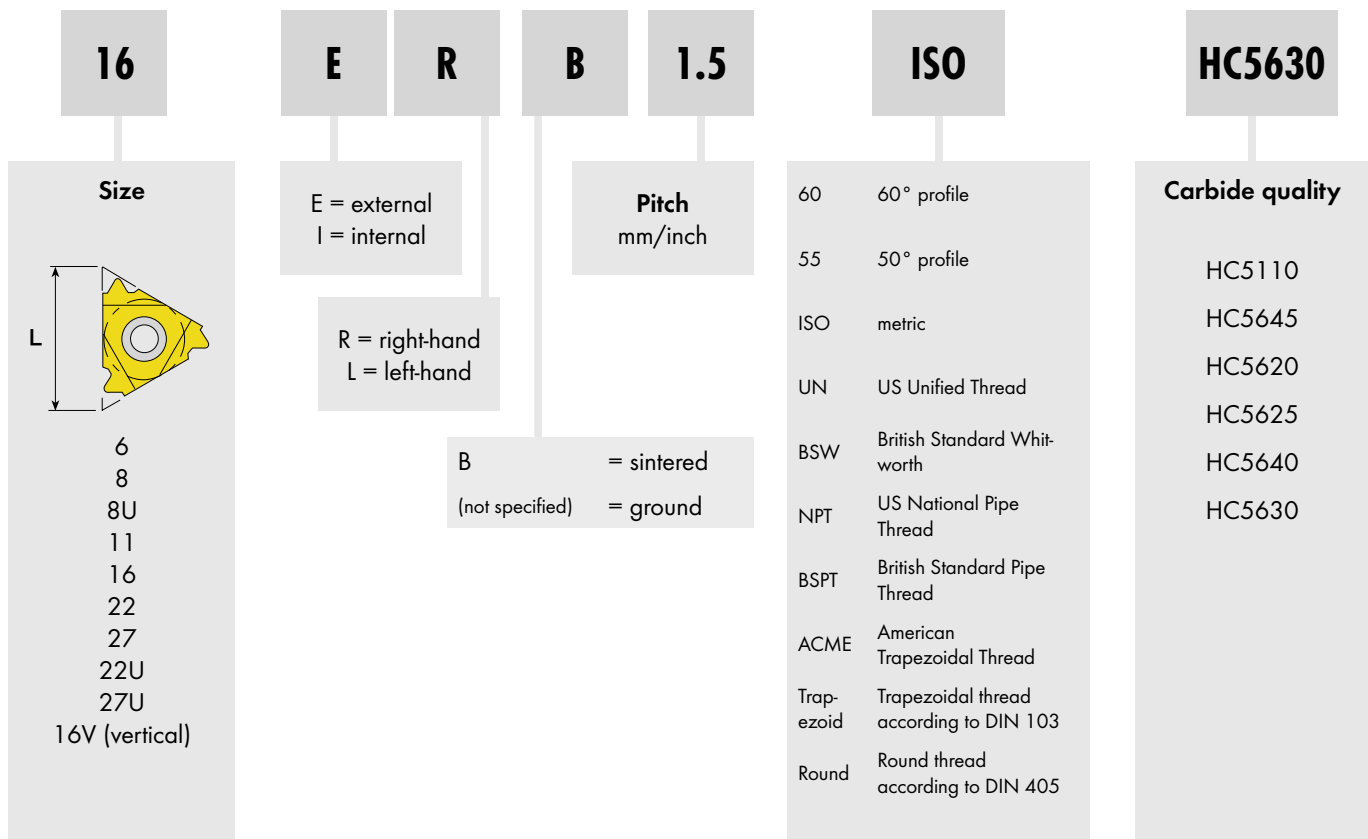
## ATORN® Indexable inserts for grooving system DED

- Please adjust these guideline values according to clamping operation and machine set-up!

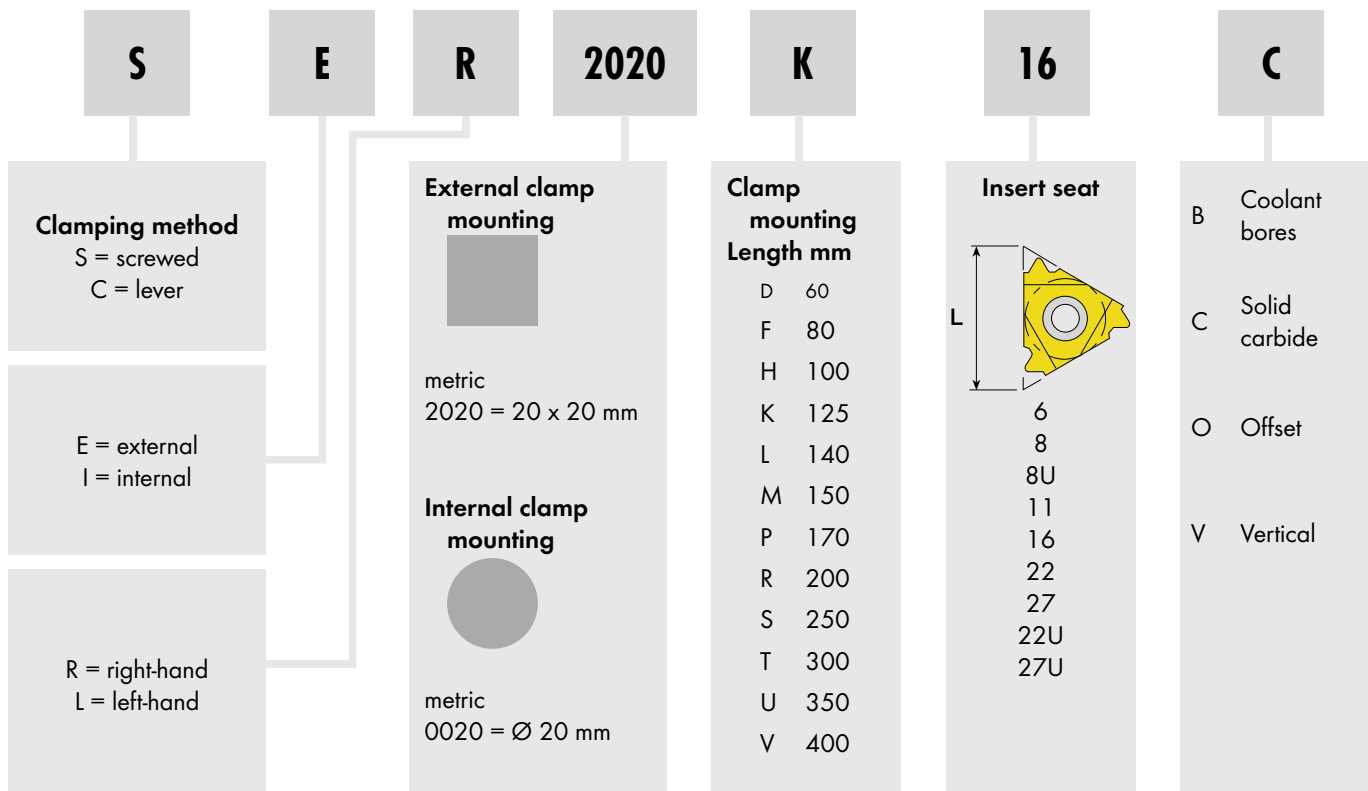
ISO	Materials group	Strength N/mm <sup>2</sup> or HB	Cutting speed Vc m/min	Feed rates f mm/rev	Cooling
P	General structural steel	≤ 500	180	0.05 - 0.10	Emulsion
		500 - 800	160	0.5 - 0.10	Emulsion
	Machining steel	≤ 800	210	0.05 - 0.12	Emulsion
		800 - 1000	180	0.05 - 0.12	Emulsion
	Case-hardened steel, unalloyed	≤ 800	250	0.05 - 0.10	Emulsion
		800 - 1000	180	0.05 - 0.10	Emulsion
	Case-hardened steel, alloyed	1000 - 1200	140	0.05 - 0.10	Emulsion
		800 - 1000	180	0.05 - 0.10	Emulsion
	Nitriding steel	1000 - 1200	140	0.05 - 0.10	Emulsion
		≤ 800	210	0.05 - 0.10	Emulsion
	Tempering steel, unalloyed	800 - 1000	180	0.05 - 0.10	Emulsion
		800 - 1000	160	0.05 - 0.07	Emulsion
	Tempering steel, alloyed	1000 - 1200	120	0.05 - 0.07	Emulsion
	Cold-work tool steel		140	0.05 - 0.10	Emulsion
	Hot-work tool steel		120	0.05 - 0.10	Emulsion
	High-speed steel	650 - 1000	80	0.05 - 0.07	Emulsion
	Spring steel	≤ 350 HB	60	0.05 - 0.07	Emulsion
M	Steel and cast steel, stainless steel sulphurised	≤ 850	160	0.03 - 0.08	Emulsion
	Stainless steel, ferritic	≤ 850	120	0.03 - 0.08	Emulsion
	Stainless steel, martensitic	≤ 850	140	0.03 - 0.08	Emulsion
	Stainless steel, austenitic	≤ 850	120	0.03 - 0.08	Emulsion
K	Grey cast iron	≤ 240 HB	110	0.05 - 0.10	Emulsion
		≤ 300 HB	95	0.05 - 0.10	Emulsion
	Spheroidal graphite cast iron	≤ 240 HB	100	0.05 - 0.10	Emulsion
		≤ 300 HB	65	0.05 - 0.10	Emulsion
	Whiteheart malleable cast iron	≤ 240 HB	110	0.05 - 0.10	Emulsion
		≤ 300 HB	60	0.05 - 0.10	Emulsion
Blackheart malleable cast iron	≤ 240 HB	110	0.05 - 0.10	Emulsion	
	≤ 300 HB	60	0.05 - 0.10	Emulsion	
N	Pure copper	≤ 400	180	0.05 - 0.12	Petroleum
	Brass short-chipping	≤ 600	180	0.05 - 0.12	Petroleum
		≤ 600	160	0.05 - 0.12	Petroleum
		≤ 600	180	0.05 - 0.12	Petroleum
	Bronze short-chipping	≤ 600	160	0.05 - 0.12	Petroleum
		≤ 850	160	0.05 - 0.12	Petroleum
	Bronze long-chipping	800 - 1000	140	0.05 - 0.12	Petroleum
	Red brass		160	0.05 - 0.12	Petroleum
	Magnesium alloys	≤ 850	250	0.05 - 0.12	Emulsion
	Pure aluminium	≤ 400	800	0.05 - 0.12	Emulsion
Wrought aluminium alloys	≤ 450	600	0.05 - 0.12	Emulsion	
Cast aluminium alloys < 12 Si	≤ 600	500	0.05 - 0.12	Emulsion	
	≤ 600	600	0.05 - 0.12	Emulsion	
Thermoplastics		120	0.05 - 0.12	Emulsion	
Thermosets		180	0.05 - 0.12	Emulsion	
Glass/carbon-fibre reinforced		80	0.05 - 0.12	Emulsion	
S	Ultra heat-resistant steels	≤ 1200	50	0.03 - 0.08	Emulsion
	Special alloys	≤ 850	40	0.03 - 0.08	Emulsion
	Pure titanium	≤ 850	50	0.03 - 0.08	Emulsion
	Titanium alloys	≤ 850-1200	30	0.03 - 0.08	Emulsion

**ATORN® Designation code for threading inserts and tool holders**

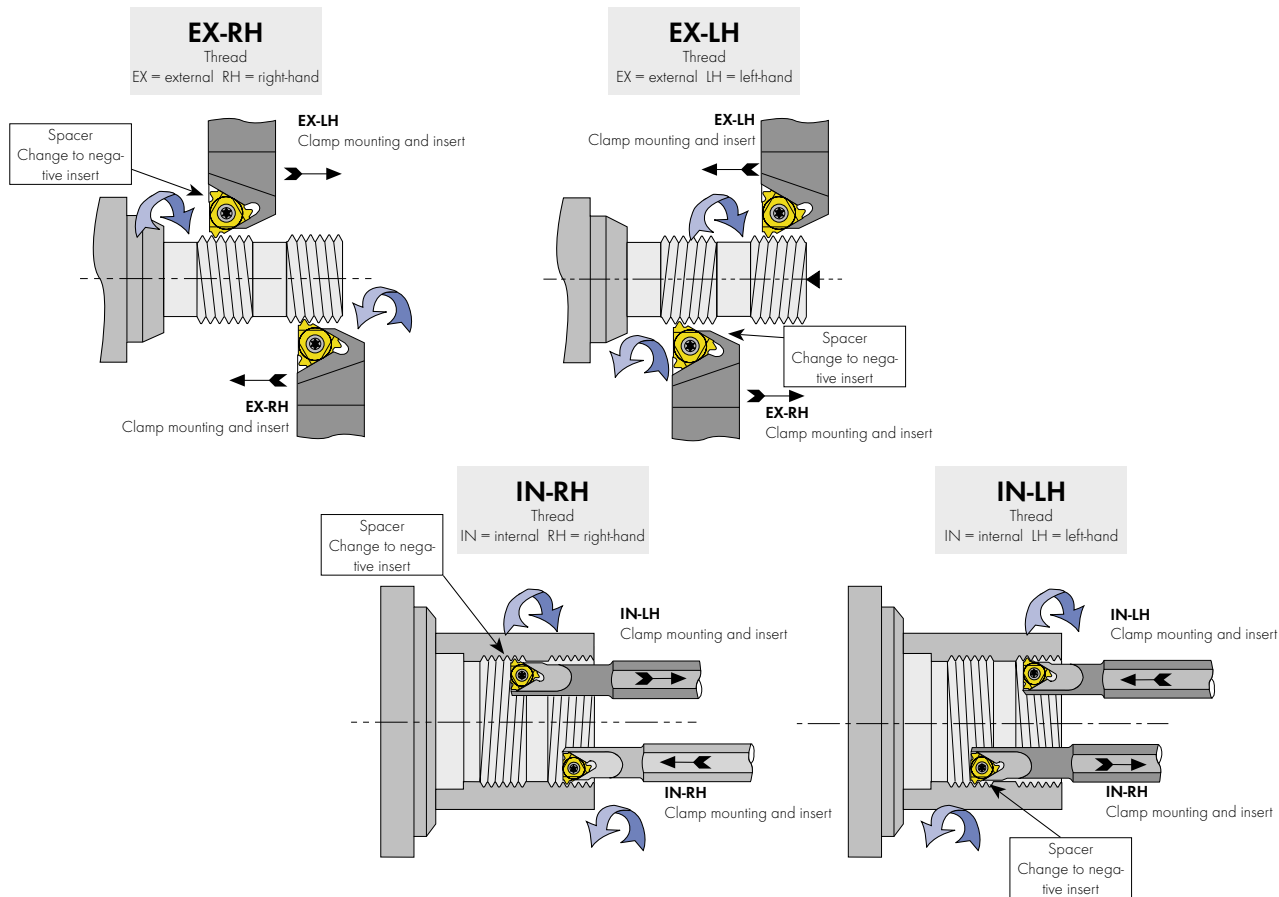
**Threading inserts**



**Clamp mounting**



# ATORN® Thread cutter holder applications



## Carbide qualities and cutting speed recommendations (m/min.)

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	HC5625	HC5615	HC5630	HC5640	HC5620	HC5110
					PVD TiN	PVD TiN	PVD TiN	PVD TiN	PVD TiN	
Cutting speed Vc m/min										
P	Machining steel	Up to 700	9 SMn 28	1.0715	80 - 160	90 - 160	100 - 180	20 - 100	110 - 210	
	Unalloyed structural steel	Up to 700	St-52	1.0052	80 - 160	90 - 160	100 - 180	20 - 100	110 - 210	
	Structural steel	700 - 950	Ck45	1.1191	80 - 160	90 - 160	100 - 180	20 - 100	110 - 210	
	Tempering steel	500 - 950	42 CrMo4	1.7225	80-120	80 - 150	90 - 160	30 - 80	90 - 140	
	Cast steel	Up to 950	GS 40	1.0416	80 - 140	100 - 140	120 - 160	40 - 80	110 - 210	
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80-120	80 - 150	90 - 160	30 - 80	90 - 140	
	Tempering steel	950 - 1300	43CrMo4	1.3563	50 - 100	80-120	90 - 120	40 - 90	70 - 90	
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	50 - 100	80-120	90 - 120	40 - 90	70 - 90	
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	50 - 100	80-120	90 - 120	40 - 90	70 - 90	
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	60 - 90	70 - 120	90 - 130	30 - 90	100 - 160	
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	60 - 90	70 - 120	90 - 130	30 - 90	100 - 140	
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	30 - 60	30 - 70	30 - 90	20 - 40	60 - 100	
K	Grey cast iron	Up to 260 HB	GG 25	0.6025		80 - 130	80 - 150	30 - 90	140 - 150	
	Alloyed grey cast iron	Up to 310 HB	GG-LNiCr 35 2	0.6678		60 - 100	80-120	20 - 50	100 - 120	
	Ductile iron	Up to 280 HB	GGG 60	0.7060		80 - 130	80 - 150	30 - 90	140 - 150	
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155		80 - 130	80 - 150	30 - 90	140 - 150	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535		300 - 600		20 - 200	700 - 1000	
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581		300 - 600		20 - 200	700 - 1000	
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016		300 - 600		20 - 200	700 - 1000	
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730		300 - 600		20 - 200	700 - 1000	
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250		300 - 600		20 - 200	700 - 1000	
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381		300 - 600		20 - 200	700 - 1000	
	Thermoplastic		PVC			300 - 600		20 - 200	700 - 1000	
	Thermoset		Melamine			300 - 600		20 - 200	700 - 1000	
	Fibre-reinforced plastics		CFRP, GFRP			300 - 600		20 - 200	700 - 1000	
	Graphite		C8000			300 - 600		20 - 200	700 - 1000	
Composite materials		Honeycomb			300 - 600		20 - 200	700 - 1000		
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174			25 - 40		15 - 40	15 - 40
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718			25 - 60		30 - 65	30 - 70
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718			25 - 60		30 - 65	30 - 70
H	Hardened materials up to 55 Hrc		X40Cr14	1.2083			20 - 40		30 - 40	20 - 50

## Choice of number of cuts

- The number of cuts should be increased for the mini or ultra-mini system, as well as for hard materials.

Pitch	mm	0.5	1.0	1.5	2.0	2.5	3.0	4.0	6.0
	TPI	48	24	16	12	10	8	6	4
Number of cuts		3 - 6	4 - 9	5 - 11	6 - 13	7 - 15	8 - 17	10 - 20	11 - 22

# Pitch angle calculation and selection of spacers

Formula for calculating the pitch angle  $\beta$

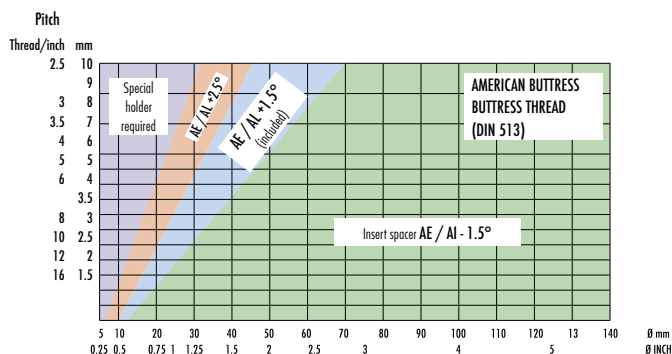
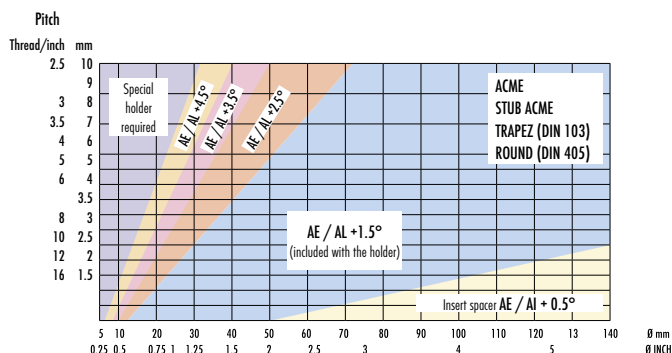
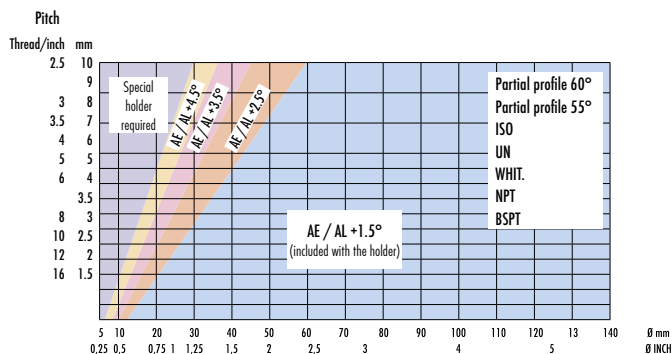
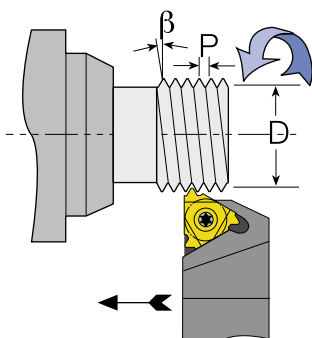
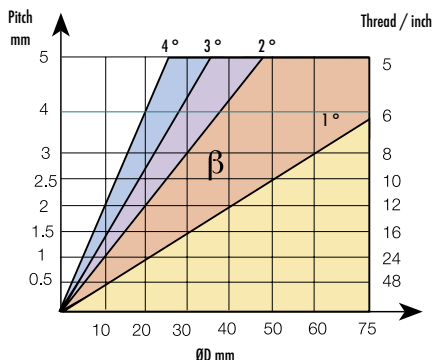
$$\tan \beta = P (\text{pitch}) / \pi \times \varnothing D$$

simplified:  $\beta = 20 \times P / \varnothing D$

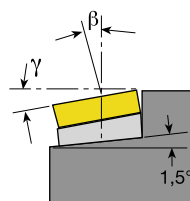
Example:

$$\varnothing D = 30 \text{ mm}, P = 1.5 \text{ mm}$$

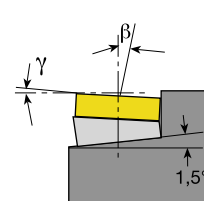
$$\beta = 20 \times 1.5 / 30 = 1$$



For most applications it is not necessary to change the spacer. However if a change is necessary, please select:  
**AE spacers for EX-RH and IN-LH clamp mounting and**  
**AI spacers for IN-RH and EX-LH clamp mounting**



Positive pitch angle



Negative pitch angle

## Spacers, positive pitch angle

For turning right-hand thread with right clamp mounting or left-hand thread with left clamp mounting

## Spacers, negative pitch angle

For turning right-hand thread with left clamp mounting or left-hand thread with right clamp mounting

## Important:

The dimension H remains constant for each spacer combination.

L IC	Pitch angle	4.5 °	3.5 °	2.5 °	1.5 °	0.5 °	-0.5 °	-1.5 °
	Clamp mounting				Standard			
16 (3/8)	EX RH/IN LH	AE16 +4.5	AE16 +3.5	AE16 +2.5	AE16	AE16 +0.5	AE16 -0.5	AE16 -1.5
	EX LH/IN RH	AL16 +4.5	AL16 +3.5	AL16 +2.5	AL16	AL16 +0.5	AL16 -0.5	AL16 -1.5
22 (1/2)	EX RH/IN LH	AE22 +4.5	AE22 +3.5	AE22 +2.5	AE22	AE22 +0.5	AE22 -0.5	AE22 -1.5
	EX LH/IN RH	AL22 +4.5	AL22 +3.5	AL22 +2.5	AL22	AL22 +0.5	AL22 -0.5	AL22 -1.5
27 (5/8)	EX RH/IN LH	AE27 +4.5	AE27 +3.5	AE27 +2.5	AE27	AE27 +0.5	AE27 -0.5	AE27 -1.5
	EX LH/IN RH	AL27 +4.5	AL27 +3.5	AL27 +2.5	AL27	AL27 +0.5	AL27 -0.5	AL27 -1.5
22U (1/2)	EX RH/IN LH	AE22U +4.5	AE22U +3.5	AE22U +2.5	AE22U	AE22U +0.5	AE22U -0.5	AE22U -1.5
	EX LH/IN RH	AL22U +4.5	AL22U +3.5	AL22U +2.5	AL22U	AL22U +0.5	AL22U -0.5	AL22U -1.5
27 U (5/8)	EX RH/IN LH	AE27U +4.5	AE27U +3.5	AE27U +2.5	AE27U	AE27U +0.5	AE27U -0.5	AE27U -1.5
	EX LH/IN RH	AL27U +4.5	AL27U +3.5	AL27U +2.5	AL27U	AL27U +0.5	AL27U -0.5	AL27U -1.5

## Comparison tables for thread cutting tools

### ISO threading inserts of varying brands

Example: 16 mm, 1.5 ISO

	Threading insert <b>EX RH</b>	Threading insert <b>EX LH</b>	Threading insert <b>IN RH</b>	Threading insert <b>IN LH</b>
<b>ATORN</b>	16 ER 1.5 ISO	16 EL 1.5 ISO	16 IR 1.5 ISO	16 IL 1.5 ISO
<b>SECO-SNAPTAP</b>	16 ER 1.5 ISO	16 EL 1.5 ISO	16 NR 1.5 ISO	16 NL 1.5 ISO
<b>KENNAMETAL</b>	LT 16 ER	LT 16 EL	LT 16 NR	LT 16 NL
<b>SANDVIK*</b>	R166.0G-16MM01-150	L166.0G-16MM01-150	R166.0L-16MM01-150	L166.0L-16MM01-150
<b>ISCAR</b>	16 ER 1.5 ISO	16 EL 1.5 ISO	16 IR 1.5 ISO	16 IL 1.5 ISO
<b>VARGUS</b>	3 ER 1.5 ISO	3 EL 1.5 ISO	3 IR 1.5 ISO	3 IL 1.5 ISO

\* these inserts cannot be used with ATORN or CPT holders

### Clamp mounting (with screw) of varying brands

Example: Holder B = H = 25 mm, for insert 16 mm

	Clamp mounting <b>EX RH</b>	Clamp mounting <b>EX LH</b>	Clamp mounting <b>IN RH</b>	Clamp mounting <b>IN LH</b>
<b>ATORN</b>	SER 2525 M 16	SEL 2525 M 16	SIR 0025 R 16	SIL 0025 R 16
<b>SECO-SNAPTAP</b>	SER 2525 M 16	SEL 2525 M 16	SNR 0025 R 16	SNL 0025 R 16
<b>KENNAMETAL</b>	LSSR 2525 M 16	LSSR 2525 M 16	S 25 R LSER - 16	S 25 R LSEL - 16
<b>SANDVIK*</b>	R 166.0 F G 2525 - 16	L 166.0 F G 2525 - 16	R 166.0 KF 25 - 16	L 166.0 KF 225 - 16
<b>ISCAR</b>	SER 2525 M 16	SEL 2525 M 16	SIR 0025 R 16	SIL 0025 R 16
<b>VARGUS</b>	AL 25 - 3	AL 25-3 LH	AVR 25D - 3	AVR 25D - 3 LH

\* these holders are not suitable for ATORN or CPT

### Carbide quality designations of varying brands

ISO CODE	ATORN	CPT	SECO-SNAPTAP	KENNAMETAL	SANDVIK	ISCAR	VARGUS
<b>P 15 - P 30</b>	HC 5625	P 25 C	CP30	KC 710	GC 225	IC 250	VSX
<b>P 10 - P 25</b> <b>K 10 - K 20</b>	HC 5615	MXC	CP50	KC 730	GC 1020	IC 220	VKX
<b>P 25 - P 40</b> <b>K 25 - K 40</b>	HC 5640	BXC	CP20	-	GC 1020	IC 228	-
<b>P 15 - P 30</b> <b>K 20 - K 30</b> <b>S 10 - S 20</b> <b>M 10 - M 20</b>	HC 5630	BMA	CP500	KC 5025	GC4125	IC 908	VTX
<b>M 10 - M 20</b> <b>K 05 - K 20</b> <b>N 10 - N 20</b> <b>S 10 - S 20</b>	HC 5620	BMZ/BLU	-	-	-	-	VM7
<b>H 01 - H 20</b>	HC 5110	HBA	-	-	-	-	-

## ATORN® Pitch angle and correction inserts

### Standard thread

D Ø	P	P <	U-insert
2	0.4	3.64	3.5
2.2	0.45	3.73	3.5
2.5	0.45	3.28	3.5
3	0.5	3.04	3.5
3.5	0.6	3.12	3.5
4	0.7	3.19	3.5
4.5	0.75	3.04	3.5
5	0.8	2.92	2.5
6	1	3.04	3.5
8	1.25	2.85	2.5
10	1.5	2.73	2.5
12	1.75	2.66	2.5
14	2	2.6	2.5
16	2	2.28	2.5
18	2.5	2.53	2.5
20	2.5	2.28	2.5
22	2.5	2.07	2.5
24	3	2.28	2.5
27	3	2.03	2.5
30	3.5	2.13	2.5
33	3.5	1.93	AE/Al
36	4	2.03	2.5
39	4	1.87	AE/Al
42	4.5	1.95	AE/Al
45	4.5	1.82	AE/Al
48	5	1.9	AE/Al
52	5	1.75	AE/Al
56	5.5	1.79	AE/Al
60	5.5	1.67	AE/Al
64	6	1.71	AE/Al
68	6	1.61	AE/Al

### Trapezoidal thread DIN 103 T.2

D Ø	P	P <	U-insert
8	1.5	3.42	3.5
9	2	4.05	4.5
10	2	3.64	3.5
11	2	3.31	3.5
12	3	4.55	4.5
14	3	3.9	3.5
16	4	4.55	4.5
18	4	4.05	4.5
20	4	3.64	3.5
22	5	4.14	4.5
24	5	3.79	3.5
28	5	3.25	3.5
30	6	3.64	3.5
36	6	3.04	3.5
38	6	2.88	2.5
40	7	3.19	3.5
42	7	3.04	2.5
44	7	2.9	3.5
46	7	2.77	2.5
48	8	3.04	3.5
50	8	2.92	2.5
54	8	2.7	2.5
55	9	2.98	2.5
60	9	2.73	2.5
65	10	2.8	2.5
80	10	2.28	2.5
85	12	2.57	2.5
105	12	2.08	2.5
110	12	1.99	AE/Al
115	14	2.22	2.5
125	14	2.04	2.5
130	14	1.96	AE/Al
145	14	1.76	AE/Al
150	16	1.94	AE/Al
175	16	1.67	AE/Al
180	18	1.82	AE/Al

### Fine thread DIN 13 Bl.1

D Ø	P	P <	U-insert
3.5	0.5	2.6	2.5
4.5	0.5	2.03	2.5
> 5	0.5	1.82	AE/Al
< 9	0.5	1.01	AE/Al
> 10	0.5	0.91	0.5
< 90	0.5	0.1	0.5

### Fine thread DIN 13 Bl.4

D Ø	P	P <	U insert
5	0.75	2.73	+2.5
6	0.75	2.28	+2.5
> 7	0.75	1.95	AE/Al
< 13	0.75	1.05	AE/Al
> 14	0.75	0.98	+0.5
< 110	0.75	0.12	+0.5

### Fine thread DIN 13 Bl.5

D Ø	P	P <	U insert
7.5	1	2.43	+2.5
9	1	2.03	+2.5
> 9.5	1	1.92	AE/Al
< 18	1	1.01	AE/Al
> 19	1	0.96	+0.5
< 200	1	0.09	+0.5
10	1.25	2.28	+2.5
12	1.25	1.9	AE/Al

### Fine thread DIN 13 Bl.6

D Ø	P	P <	U insert
12	1.5	2.28	+2.5
13	1.5	2.10	+2.5
> 14	1.5	1.95	AE/Al
< 27	1.5	1.01	AE/Al
> 28	1.5	0.98	+0.5
< 300	1.5	0.09	+0.5

### Whitworth thread DIN 11

D Ø	D Ø inch	Gg./inch	P	P <	U insert
6.35	1/4	20	1.27	3.64	+3.5
7.938	5/16	18	1.411	3.24	+3.5
9.525	3/8	16	1.588	3.04	+3.5
11.113	7/16	14	1.814	2.97	+2.5
12.7	1/2	12	2.117	3.04	+3.5
15.876	5/8	11	2.309	2.65	+2.5
19.051	3/4	10	2.54	2.43	+2.5
22.226	7/8	9	2.822	2.31	+2.5
25.401	1	8	3.175	2.28	+2.5
28.576	1 1/8	7	3.629	2.31	+2.5
31.751	1 1/4	7	3.629	2.08	+2.5
34.926	1 3/8	6	4.233	2.21	+2.5
38.101	1 1/2	6	4.233	2.03	+2.5
41.277	1 5/8	5	5.08	2.24	+2.5
44.452	1 3/4	5	5.08	2.08	+2.5
47.627	1 7/8	4.5	5.645	2.16	+2.5
50.802	2	4.5	5.645	2.03	+2.5

### Whitworth pipe thread DIN 2999 DIN 228 ISO 7/1

D Ø	D Ø inch	Gg./inch	P	P <	U insert
9.728	R 1/8	28	0.907	1.7	AE/Al
13.157	R 1/4	19	1.337	1.85	AE/Al
16.662	R 3/8	19	1.337	1.46	AE/Al
20.955	R 1/2	14	1.814	1.58	AE/Al
26.441	R 3/4	14	1.814	1.25	AE/Al
33.249	R 1	11	2.309	1.27	AE/Al
41.91	R 1 1/4	11	2.309	1	AE/Al
47.803	R 1 1/2	11	2.309	0.88	+0.5
59.614	R 2	11	2.309	0.71	+0.5
75.184	R 2 1/2	11	2.309	0.56	+0.5
87.884	R 3	11	2.309	0.48	+0.5
100.33	R 3 1/2	11	2.309	0.42	+0.5
113.03	R 4	11	2.309	0.37	+0.5
138.43	R 5	11	2.309	0.3	+0.5
163.83	R 6	11	2.309	0.26	+0.5

### Fine thread DIN 13 Bl.7

D Ø	P	P <	U insert
17	+3.5	2.14	+2.5
18	2	2.03	+2.5
> 19	2	1.92	AE/Al
< 36	2	1.01	AE/Al
> 38	2	0.96	+0.5
< 300	2	0.12	+0.5

### Fine thread DIN 13 Bl.8

D Ø	P	P <	U insert
> 28	3	1.95	AE/Al
< 52	3	1.05	AE/Al
> 55	3	0.99	+0.5
< 300	3	0.18	+0.5

### Fine thread DIN 13 Bl.9

D Ø	P	P <	U insert
> 42	4	1.74	AE/Al
< 72	4	1.01	AE/Al
> 75	4	0.97	+0.5
< 300	4	0.24	+0.5

### Fine thread DIN 13 Bl.10

D Ø	P	P <	U insert
> 70	6	1.56	AE/Al
< 105	6	1.04	AE/Al
110	6	0.99	+0.5

### Fine thread DIN 13 Bl.11

D Ø	P	P <	U insert
130	8	1.12	AE/Al
140	8	1.04	AE/Al
> 150	8	0.97	+0.5
< 1000	8	0.15	+0.5

## UNC thread ASA B1.1

D Ø	D Ø inch	Gg./inch	P	P <	U insert
1.854	No. 1	64	0.397	3.9	+3.5
2.184	No. 2	56	0.454	3.78	+3.5
2.515	No. 3	48	0.529	3.83	+3.5
2.845	No. 4	40	0.635	4.06	+4.5
3.175	No. 5	40	0.635	3.64	+3.5
3.505	No. 6	32	0.794	4.12	+4.5
4.166	No. 8	32	0.794	3.47	+3.5
4.826	No. 10	24	1.058	3.99	+3.5
5.486	No. 12	24	1.058	3.51	+3.5
6.35	1/4	20	1.27	3.64	+3.5
7.938	5/16	18	1.411	3.24	+3.5
9.525	3/8	16	1.588	3.04	+3.5
11.112	7/16	14	1.814	2.98	+2.5
12.7	1/2	13	1.954	2.8	+2.5
14.288	9/16	12	2.117	2.7	+2.5
15.875	5/8	11	2.309	2.65	+2.5
19.05	3/4	10	2.54	2.43	+2.5
22.225	7/8	9	2.822	2.31	+2.5
25.4	1	8	3.175	2.28	+2.5
28.575	1 1/8	7	3.629	2.31	+2.5
31.75	1 1/4	7	3.629	2.08	+2.5
34.925	1 3/8	6	4.233	2.21	+2.5
38.1	1 1/2	6	4.233	2.03	+2.5
44.45	1 3/4	5	5.08	2.08	+2.5
50.8	2	4.5	5.644	2.03	+2.5
57.15	2 1/4	4.5	5.644	1.8	AE/Al
63.5	2 1/2	4	6.35	1.82	AE/Al
69.85	2 3/4	4	6.35	1.66	AE/Al
76.2	3	4	6.35	1.52	AE/Al
82.55	3 1/4	4	6.35	1.4	AE/Al
88.9	3 1/2	4	6.35	1.3	AE/Al
95.25	3 3/4	4	6.35	1.22	AE/Al
101.6	4	4	6.35	1.14	AE/Al

## UNF thread ASA B1.1

D Ø	D Ø inch	Gg./inch	P	P <	U insert
1.524	No. 0	80	0.318	3.79	+3.5
1.854	No. 1	72	0.353	3.47	+3.5
2.184	No. 2	64	0.397	3.31	+3.5
2.515	No. 3	56	0.454	3.29	+3.5
2.845	No. 4	48	0.529	3.39	+3.5
3.175	No. 5	44	0.577	3.31	+3.5
3.505	No. 6	40	0.635	3.3	+3.5
4.166	No. 8	36	0.706	3.09	+3.5
4.826	No. 10	32	0.794	3	+2.5
5.486	No. 12	28	0.907	3.01	+3.5
6.35	1/4	28	0.907	2.6	+2.5
7.938	5/16	24	1.058	2.43	+2.5
9.525	3/8	24	1.058	2.03	+2.5
11.112	7/16	20	1.27	2.08	+2.5
12.7	1/2	20	1.27	1.82	AE/Al
14.288	9/16	18	1.411	1.8	AE/Al
15.875	5/8	18	1.411	1.62	AE/Al
19.05	3/4	16	1.588	1.52	AE/Al
22.225	7/8	14	1.814	1.49	AE/Al
25.4	1	12	2.117	1.52	AE/Al
28.575	1 1/8	12	2.117	1.35	AE/Al
31.75	1 1/4	12	2.117	1.22	AE/Al
34.925	1 3/8	12	2.117	1.11	AE/Al
38.1	1 1/2	12	2.117	1.01	AE/Al

## PG DIN 40430

PG	D Ø	Gg./inch	P	P <	U insert
7	12.7	20	1.27	2	AE/Al
9	15.2	18	1.41	1.85	AE/Al
11	18.6	18	1.41	1.51	AE/Al
13.5	20.4	18	1.41	1.38	AE/Al
16	22.5	18	1.41	1.25	AE/Al
21	28.3	16	1.588	1.12	AE/Al
29	37	16	1.588	0.85	+0.5
36	47	16	1.588	0.67	+0.5
42	54	16	1.588	0.58	+0.5
48	59.3	16	1.588	0.53	+0.5



Ground sharp ...

... optimal chip control.

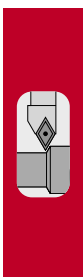
**ATORN**<sup>®</sup>  
Performance demands quality



## ATORN® Recess turning and thread cutting with MINI-CUT

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev
P	Unalloyed structural steel	9 S 20	1.0711	120 - 200	
		ST 37	1.0037		
		ST 50	1.0050		
	Low-alloy steel	ST 70	1.0070	80 - 190	
		16 MnCr 5	1.7131		
	High-alloy steel	25 CrMo 4	1.7218	80 - 160	
90 MnCrV 8		1.2842			
42 CrMoV		1.7225			
M	Stainless steel, martensitic	X 40 CrMoS 17	1.2344	80 - 160	
		X 6 CrA 13	1.4002		
		X 6 CrTi 17	1.4510		
	Stainless steel austenitic	X 12 CrMoS 17	1.4104	80 - 140	
		20 CrNi 17 2	1.4057		
		X 5 CrNi 18 10	1.4301		
K	Grey cast iron	X 6 CrNiMoTi 17 12 2	1.4571	60 - 180	
		GG 20	0.6020		
	Grey cast iron with spheroidal graphite	GG 40	0.6040	60 - 180	
		GGG 40	0.7040		
	Malleable cast iron	GGG 70	0.7070	60 - 180	
		GTW 35	0.8035		
N	Aluminium 0.5 10% Si	GTS 55	0.8155	60 - 180	
		MS 58	2.0402		
	Copper	G-MgAl9Zn 1	3.5912	100 - 800	
S	Ultra heat-resistant alloys	TiAl6Sn 2	3.7174	30 - 80	
	Titanium alloys	NiCr12Al6MoNb	2.4670	30 - 80	



Grooving from 2 mm ...

... with internal cooling.

**ATORN®**  
Performance demands quality

## Cutting inserts mini-børe

- Please adjust these guideline values according to clamping operation and machine set-up!

### Internal thread turning, cutting material HC 8615 TiN

ISO	Materials group	Strength N/mm <sup>2</sup>	Cutting speed Vc m/min	Number of cuts				
				Pitch 0.5 mm = 48 thread/inch	Pitch 0.75 mm = 32 thread/inch	Pitch 1 mm = 24 thread/inch	Pitch 1.25 mm = 20 thread/inch	Pitch 1.5 mm = 16 thread/inch
P	Steel material	400 - 550	160	6	8	10	12	15
		500 - 700	140	6	8	10	12	15
		700 - 850	120	7	9	12	14	17
		850 - 1150	90	7	9	12	14	17
		> 1150	70	8	10	12	15	18
M	Stainless steel		90	8	10	12	15	18
K	Grey cast iron		100	7	9	12	14	17
N	Aluminium		300	6	8	10	12	15

### Internal recess turning

ISO	Materials group	Strength N/mm <sup>2</sup>	Cutting speed Vc m/min			
			K10F Feed f = 0.01-0.025 mm/rev	CN45F Feed f = 0.01-0.025 mm/rev	AL41F Feed f = 0.01-0.025 mm/rev	X2CA Feed f = 0.02-0.06 mm/rev
P	Carbon steels C = 0.4-0.8%	600 - 1000	30 - 100	40 - 180	80 - 200	
	Cast steel	500 - 900	30 - 110	40 - 180	70 - 180	
	Alloyed steels	500 - 1400	30 - 90	40 - 140	70 - 160	
M	Stainless steel CR = 12-18%	150-250 HB	30 - 90	40 - 140	80 - 160	
	Stainless steel austenitic	600 - 1200	30 - 90	40 - 140	80 - 160	
K	Grey cast iron	250-300 HB	30 - 100	40 - 140	30 - 180	
	Spheroidal graphite iron, ferritic	140-180 HB	30 - 100	40 - 140	30 - 180	
	Spheroidal graphite iron, pearlitic	230-280 HB	30 - 100	40 - 140	30 - 180	
	Malleable cast iron	160-240 HB	30 - 100	40 - 140	30 - 180	
N	Aluminium, Al-Si alloys	50-140 HB	90 - 200		80 - 700	
	Copper, brass, bronze		90 - 200		80 - 700	
	Plastics		90 - 200		80 - 700	
H	Hardened steel	46 - 66HRc				70 - 100

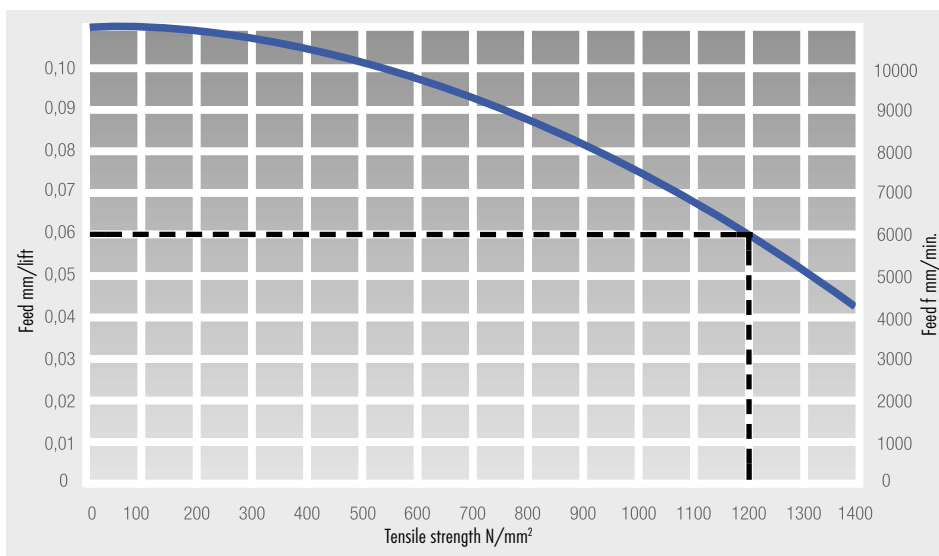
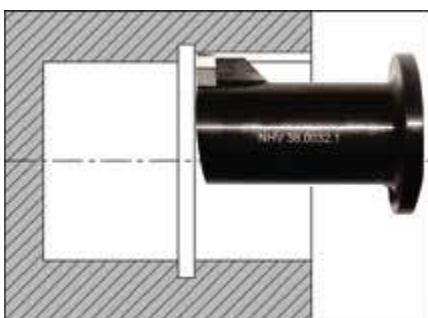
## ATORN® Cutting inserts for keyway slotting

- Observe the undercut at the end of the cleared slot to allow free discharge of the tool.
- The cutting edge should not touch the base of the slot while the tool is retracting.
- Adjustment of the tool is not permitted. Therefore carefully check the diameter of the workpiece before you proceed.
- If you use oil or an emulsion, the chips are flushed away from the workpiece; this also helps to produce a perfect surface.
- If the tool is aligned upwards, the chips automatically fall downwards away from the cutting edge.
- Avoid interrupted cutting.

### Guide values for slotting

Example:

- Tempering steel e.g. 42CrMo4 with 1200 N/mm<sup>2</sup>
- Feed per lift 0.05-0.06 mm
  - Feed f = 5500 mm/min



## Cutting inserts DT

- Please adjust these guideline values according to clamping operation and machine set-up!
- **Feed values (f) are dependent on the coolant pressure:**
  - Coolant pressure 10-30 bar:** select lower third of the feed values
  - Coolant pressure 30-70 bar:** select upper half of the feed values
- the feed values (f) are also dependent on the material

ISO	Materials group	Strength N/mm <sup>2</sup>	Cutting speed Vc m/min	
				<b>AL41F</b>
P	Carbon steels C = 0.4-0.8%	600 - 1000		80 - 200
	Cast steel	500 - 900		70 - 180
	Alloyed steels	500 - 1400		70 - 140
M	Stainless steel CR = 12-18%	150 - 250 HB		80 - 160
	Stainless steel austenitic	600 - 1200		20 - 65
K	Grey cast iron	250 - 300 HB		30 - 180
	Spheroidal graphite iron, ferritic	140 - 180 HB		30 - 180
	Spheroidal graphite iron, pearlitic	230 - 280 HB		30 - 180
	Malleable cast iron	160 - 240 HB		20 - 90
N	Aluminium, Al-Si alloys	50 - 140 HB		80 - 600
	Copper, brass, bronze			80 - 200

### Drilling

		Feed f mm/U	
R/L DT,3-	10	0,0025 - 0,0125	
	13	0,0025 - 0,010	
R/L DT,4-	15	0,005 - 0,030	
	20	0,005 - 0,015	
R/L DT,5-	15	0,005 - 0,040	
	25	0,005 - 0,020	
R/L DT,6-	15	0,005 - 0,030	
	30	0,005 - 0,020	
R/L DT,7-	20	0,005 - 0,035	
	35	0,005 - 0,025	
R/L DT,8-	25	0,005 - 0,040	
	40	0,005 - 0,030	

### Turning

		Span depth ap in mm								
		0,2	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0
		Feed f mm/U								
R/L DT,3-	10	0,02 - 0,07	0,02 - 0,07	0,02 - 0,05	0,005 - 0,01					
	13	0,02 - 0,05	0,02 - 0,05	0,005 - 0,03	0,005 - 0,01					
R/L DT,4-	15	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,03 - 0,07	0,01 - 0,05				
	20	0,04 - 0,1	0,04 - 0,1	0,03 - 0,08	0,01 - 0,05	0,005 - 0,025				
R/L DT,5-	15	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,03 - 0,08	0,02 - 0,06	0,01 - 0,04			
	25	0,04 - 0,1	0,04 - 0,1	0,03 - 0,09	0,02 - 0,06	0,01 - 0,04	0,005 - 0,025			
R/L DT,6-	15	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,03 - 0,08	0,02 - 0,06	0,01 - 0,04		
	30	0,04 - 0,1	0,04 - 0,1	0,03 - 0,09	0,02 - 0,06	0,01 - 0,04	0,01 - 0,03	0,005 - 0,03		
R/L DT,7-	20	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,03 - 0,08	0,02 - 0,06	0,01 - 0,04	
	35	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,03 - 0,08	0,02 - 0,06	0,01 - 0,04	0,01 - 0,03	0,01 - 0,02	
R/L DT,8-	25	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,03 - 0,08	0,02 - 0,06	0,01 - 0,04
	40	0,04 - 0,1	0,04 - 0,1	0,04 - 0,1	0,04 - 0,095	0,03 - 0,8	0,02 - 0,06	0,01 - 0,04	0,01 - 0,03	0,01 - 0,02

## Material burrs in form knurling – chip-free forming

- Empirical values for enlarging the workpiece diameter
- Deviations are possible depending on material.
- Please adjust these guideline values according to clamping operation and machine set-up!

### Knurl profile according to DIN 82: RAA (knurl profile on the workpiece)

Knurling wheels according to DIN 403:

AA (knurl profile on the knurling wheel)



ISO	Materials group	Workpiece Ø mm	Enlargement of the workpiece Ø in mm												
			Division 0.3	Division 0.4	Division 0.5	Division 0.6	Division 0.7	Division 0.8	Division 0.9	Division 1.0	Division 1.2	Division 1.5	Division 1.6	Division 1.8	Division 2.0
P	Machining steel	5	0.08	0.14	0.18	0.22	0.27	0.29	0.33	0.35	0.50	-	-	-	-
		15	0.08	0.14	0.18	0.23	0.30	0.40	0.41	0.44	0.50	0.6	0.65	0.67	0.7
		25	0.08	0.15	0.23	0.24	0.28	0.35	0.38	0.44	0.53	0.62	0.7	0.7	0.98
M	Stainless steel	5	0.1	0.15	0.2	0.25	0.28	0.30	0.35	0.42	0.41	-	-	-	-
		15	0.1	0.15	0.19	0.25	0.30	0.34	0.40	0.45	0.51	0.6	-	-	-
		25	0.1	0.14	0.2	0.26	0.31	0.33	0.38	0.43	0.50	0.62	-	-	-
N	Brass	5	0.08	0.12	0.18	0.20	0.21	0.22	0.23	0.25	0.28	-	-	-	-
		15	0.1	0.14	0.2	0.26	0.28	0.29	0.31	0.35	0.41	0.44	0.48	0.5	0.55
		25	0.1	0.15	0.2	0.25	0.28	0.30	0.32	0.36	0.43	0.46	0.50	0.53	0.53
N	Aluminium	5	0.09	0.15	0.19	0.23	0.28	0.30	0.34	0.41	0.40	-	-	-	-
		15	0.1	0.15	0.19	0.26	0.29	0.33	0.39	0.45	0.51	0.57	0.65	-	-
		25	0.09	0.15	0.19	0.26	0.29	0.32	0.37	0.45	0.52	0.59	0.65	0.78	0.75

### Knurl profile according to DIN 82: RBL 30°/RBR 30° (knurl profile on the workpiece)

Knurling wheels according to DIN 403:

BR 30°/BL 30° (knurl profile on the knurling wheel)



ISO	Materials group	Workpiece Ø mm	Enlargement of the workpiece Ø in mm												
			Division 0.3	Division 0.4	Division 0.5	Division 0.6	Division 0.7	Division 0.8	Division 0.9	Division 1.0	Division 1.2	Division 1.5	Division 1.6	Division 1.8	Division 2.0
P	Machining steel	5	0.11	0.15	0.20	0.24	0.28	0.34	0.38	0.45	0.55	-	-	-	-
		15	0.11	0.15	0.22	0.26	0.30	0.35	0.42	0.45	0.52	0.67	0.73	0.75	0.85
		25	0.11	0.14	0.23	0.25	0.28	0.36	0.42	0.45	0.56	0.7	0.72	0.78	0.9
M	Stainless steel	5	0.09	0.14	0.19	0.25	0.31	0.34	0.39	0.45	0.52	-	-	-	-
		15	0.12	0.20	0.23	0.31	0.35	0.40	0.45	0.51	0.62	0.66	0.73	0.85	0.97
		25	0.12	0.18	0.24	0.27	0.37	0.39	0.43	0.49	0.59	0.8	0.84	0.93	0.96
N	Brass	5	0.10	0.14	0.20	0.23	0.24	0.28	0.30	0.33	0.37	-	-	-	-
		15	0.10	0.15	0.21	0.23	0.24	0.31	0.36	0.41	0.47	0.53	0.53	0.65	0.63
		25	0.11	0.15	0.22	0.22	0.25	0.30	0.35	0.40	0.45	0.55	0.55	0.62	0.68
N	Aluminium	5	0.12	0.14	0.21	0.24	0.29	0.34	0.39	0.41	0.51	-	-	-	-
		15	0.12	0.18	0.23	0.26	0.36	0.40	0.43	0.50	0.56	0.56	0.56	0.74	0.75
		25	0.12	0.16	0.25	0.28	0.37	0.39	0.46	0.50	0.58	0.77	0.77	0.84	0.96

### Knurl profile according to DIN 82: RGE 30° (knurl profile on the workpiece)

Knurling wheels according to DIN 403:

BR 30° + BL 30° (knurl profile on the knurling wheel)



ISO	Materials group	Workpiece Ø mm	Enlargement of the workpiece Ø in mm												
			Division 0.3	Division 0.4	Division 0.5	Division 0.6	Division 0.7	Division 0.8	Division 0.9	Division 1.0	Division 1.2	Division 1.5	Division 1.6	Division 1.8	Division 2.0
P	Machining steel	5	"0.12"	"0.16"	"0.20"	"0.25"	"0.33"	"0.41"	"0.45"	"0.55"	"0.65"	-	-	-	-
		15	0.13	0.22	0.30	0.32	0.35	0.41	0.43	0.52	0.62	0.67	0.81	0.86	0.95
		25	0.12"	0.18"	0.28"	0.32"	0.35"	0.38"	0.43"	0.55"	0.67"	0.77	0.87	0.98	0.98
M	Stainless steel	5	"0.11"	"0.20"	"0.25"	"0.30"	"0.36"	"0.39"	"0.41"	"0.55"	"0.55"	-	-	-	-
		15	0.10	0.14	0.21	0.24	0.29	0.34	0.40	0.43	0.53	0.66	0.72	0.70	0.88
		25	0.11"	0.13"	0.20"	0.25"	0.28"	0.32"	0.41"	0.44"	0.52"	0.67	0.7	0.71	0.83
N	Brass	5	"0.12"	"0.13"	"0.16"	"0.20"	"0.24"	"0.28"	"0.30"	"0.32"	"0.38"	-	-	-	-
		15	0.12	0.16	0.18	0.24	0.28	0.30	0.37	0.39	0.40	0.48	0.52	0.55	0.63
		25	0.12"	0.17"	0.22"	0.23"	0.27"	0.30"	0.34"	0.38"	0.41"	0.48	0.5	0.63	0.63
N	Aluminium	5	"0.10"	"0.15"	"0.21"	"0.25"	"0.33"	"0.36"	"0.41"	"0.50"	"0.57"	-	-	-	-
		15	0.11	0.14	0.20	0.25	0.28	0.33	0.39	0.43	0.54	0.67	0.71	0.76	0.89
		25	0.11"	0.15"	0.22"	0.25"	0.29"	0.34"	0.40"	0.44"	0.53"	0.68	0.69	0.71	0.88

## Knurling tools

- Ensure good cooling / lubrication to prevent chips rolling in and to increase the service life of the knurl
- Please adjust these guideline values according to clamping operation and machine set-up!

### Knurling – metal cutting machining

ISO	Materials group	Workpiece Ø mm	Knurling wheel Ø mm	Vc m/min	f mm/rev				
					Radial	Axial			
						Division 0.3 - 0.5	Division 0.5 - 1.0	Division 1.0 - 1.5	Division 1.5 - 2.0
P	Machining steel	< 10	10 / 15	40 - 70	0.04 - 0.08	0.14	0.09	0.06	0.05
		10 - 40	15 / 25	50 - 90	0.05 - 0.1	0.2	0.13	0.1	0.07
		40 - 100	25 / 32 / 42	65 - 110	0.05 - 0.1	0.25	0.18	0.12	0.08
		100-250	25 / 32 / 42	65 - 100	0.05 - 0.1	0.3	0.2	0.13	0.09
		> 250	32 / 42	80-100	0.05 - 0.1	0.32	0.21	0.14	0.1
M	Stainless steel	< 10	10 / 15	22 - 40	0.04 - 0.08	0.12	0.08	0.05	0.04
		10 - 40	15 / 25	30 - 50	0.05 - 0.1	0.17	0.11	0.09	0.06
		40 - 100	25 / 32 / 42	35 - 60	0.05 - 0.1	0.21	0.15	0.1	0.07
		100-250	25 / 32 / 42	35 - 60	0.05 - 0.1	0.26	0.17	0.11	0.08
		> 250	32 / 42	45 - 55	0.05 - 0.1	0.27	0.18	0.12	0.09
N	Brass	< 10	10 / 15	55 - 100	0.04 - 0.08	0.15	0.09	0.06	0.05
		10 - 40	15 / 25	70 - 125	0.05 - 0.1	0.21	0.14	0.11	0.07
		40 - 100	25 / 32 / 42	90 - 155	0.05 - 0.1	0.26	0.19	0.13	0.08
		100-250	25 / 32 / 42	90 - 155	0.05 - 0.1	0.32	0.21	0.14	0.09
		> 250	32 / 42	115 - 140	0.05 - 0.1	0.34	0.22	0.15	0.11
N	Aluminium	< 10	10 / 15	70 - 120	0.04 - 0.08	0.18	0.11	0.08	0.06
		10 - 40	15 / 25	80 - 150	0.05 - 0.1	0.25	0.16	0.13	0.09
		40 - 100	25 / 32 / 42	110 - 160	0.05 - 0.1	0.31	0.23	0.15	0.1
		100-250	25 / 32 / 42	110 - 160	0.05 - 0.1	0.38	0.25	0.16	0.11
		> 250	32 / 42	130 - 150	0.05 - 0.1	0.4	0.26	0.18	0.13

### Form knurling – chip-free machining

ISO	Materials group	Workpiece Ø mm	Knurling wheel Ø mm	Vc m/min	f mm/rev				
					Radial	Axial			
						Division 0.3 - 0.5	Division 0.5 - 1.0	Division 1.0 - 1.5	Division 1.5 - 2.0
P	Machining steel	< 10	10 / 15	20 - 50	0.04 - 0.08	0.20	0.13	0.08	0.07
		10 - 40	15 / 20	25 - 55	0.05 - 0.1	0.28	0.18	0.14	0.10
		40 - 100	20 / 25	30 - 60	0.05 - 0.1	0.35	0.25	0.17	0.11
		100-250	20 / 25	30 - 60	0.05 - 0.1	0.42	0.28	0.18	0.13
		> 250	25	30 - 60	0.05 - 0.1	0.45	0.29	0.20	0.14
M	Stainless steel	< 10	10 / 15	15 - 40	0.04 - 0.08	0.14	0.09	0.06	0.05
		10 - 40	15 / 20	20 - 50	0.05 - 0.1	0.20	0.13	0.10	0.07
		40 - 100	20 / 25	25 - 50	0.05 - 0.1	0.25	0.18	0.12	0.08
		100-250	20 / 25	25 - 50	0.05 - 0.1	0.29	0.20	0.13	0.09
		> 250	25	25 - 50	0.05 - 0.1	0.31	0.21	0.14	0.10
N	Brass	< 10	10 / 15	30 - 75	0.04 - 0.08	0.22	0.14	0.09	0.08
		10 - 40	15 / 20	40 - 85	0.05 - 0.1	0.31	0.20	0.15	0.11
		40 - 100	20 / 25	45 - 90	0.05 - 0.1	0.39	0.28	0.18	0.12
		100-250	20 / 25	45 - 90	0.05 - 0.1	0.46	0.31	0.20	0.14
		> 250	25	45 - 90	0.05 - 0.1	0.49	0.32	0.22	0.15
N	Aluminium	< 10	10 / 15	25 - 60	0.04 - 0.08	0.12	0.08	0.05	0.04
		10 - 40	15 / 20	30 - 65	0.05 - 0.1	0.17	0.11	0.08	0.06
		40 - 100	20 / 25	35 - 70	0.05 - 0.1	0.21	0.15	0.10	0.07
		100-250	20 / 25	35 - 70	0.05 - 0.1	0.25	0.17	0.11	0.08
		> 250	25	35 - 70	0.05 - 0.1	0.27	0.18	0.12	0.08

**palbit**  **Grooving and parting-off system MINI**

- Please adjust these guideline values according to clamping operation and machine set-up!

**External machining:** **right-hand** inserts and **right-hand** holders and/or **left-hand** inserts and **left-hand** holders

- Permanent cooling across the entire cutting surface is recommended.
- Particularly appropriate for automatic feed; manual feed can reduce the service life..
- The feed should be reduced by 10-15 % when using inserts with 7° clearance angle.

**Cutting speeds for quality PH 7920**

ISO	Materials group	Strength/ Hardness N/mm <sup>2</sup>	Material example chemical	Material number	Cutting speed Vc m/min	Feed f mm	
						GS / GR	P00 / P07
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 200	0,02 - 014	0,02 - 0,14
	Unalloyed structural steel	Up to 700	St-52	1.0052			
	Structural steel	700 - 950	Ck45	1.1191			
	Tempering steel	500 - 950	42 CrMo4	1.7225			
	Cast steel	Up to 950	GS 40	1.0416			
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131			
	Tempering steel	950 - 1300	43CrMo4	1.3563			
	Nitriding steel	950 - 1300	31CrMoV9	1.8519			
M	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	60 - 180	0,02 - 014	0,02 - 0,14
	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006			
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301			
K	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	60 - 150	0,02 - 014	0,02 - 0,14
	Grey cast iron	Up to 260 HB	GG 25	0.6025			
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678			
	Ductile iron	Up to 280 HB	GGG 60	0.7060			
S	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	20 - 50	0,02 - 014	0,02 - 0,14
	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174			
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718			
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718			

## Over 200,000 tools available online!

**Advantages:**

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com

YOUR DRILL  
**GIVES UP.**  
WHAT DO YOU DO? YOU REACH  
**FOR A NEW ONE**

AND SIMPLY CARRY ON:

**SARA® GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**



A BRAND OF SARTORIUS WERKZEUGE







# Clamping equipment

Turning technology		
	Centres	1105
	Live centres	1106
	Manual chucks <b>NEW</b>	1110
	Power chuck BR <b>NEW</b>	1120
	Dead-length collets	1123
	Power-operated Collet chucks	1125
	Clamping heads	1127
	Powered tools <b>NEW</b>	1128
	High-speed spindle	1134
	Bar gripper	1136
	VDI tool holders	1137
	VDI tool holder type E2S <b>NEW</b>	1140
	Hydraulic clamping system HYDRO-FIX	1140
	Reducing bushes for boring bar holder <b>NEW</b>	1141
	HSKT turning tool holder <b>NEW</b>	1147
	Quick-change tool holder	1155
Tool holders		
<b>INFO</b>	Range overview Tool holders	1162
	Assembly aids	1164
	Stands for tool holders	1165
	Pull studs	1168
	Coolant transfer pipe	1170
	Drill chucks	1171
	Drill chuck holders	1173
	Short drill chucks	1175
	Precision chucks	1178
	GER collets, 2 µm	1180
	Power chuck UltraGrip® <b>NEW</b>	1182
	Power chuck UltraJet® <b>NEW</b>	1183
	Hydraulic expansion chucks	1186
	Tool holders with planar support	1191
	Collet chucks	1194
	ER collets	1198
	Hydraulic expansion clamping unit ECOGRIP ER	1204
	Milling cutter holders DIN 6359 with coolant bores <b>NEW</b>	1207
	Shell-type milling cutter arbours	1211
	Shell-type milling cutter arbours, vibration-dampened <b>NEW</b>	1213












	Tool holders for screw-in milling cutters		1223
	Shrink-fit technology with pyrometer coil	<b>NEW</b>	1226

## Threads

	Thread cutting machine		1237
	Thread cutting quick-change chucks		1238
	Threading tap collet chucks		1241
	ER synchro insert STA		1242









## Vices

	Precision vices		1243
	Parallel vices		1245
	Workpiece stops		1247
	Covers for boreholes and screw heads with hex	<b>NEW</b>	1248
	Clamping jaws		1248
	Parallel underlays sets		1250
	Precision machine vices		1251
	NC high-pressure machine vice MH-S		1256
	Centring vices		1260
	5-axis combination spanner AZS	<b>NEW</b>	1262
	Multiple slide rail sets 120 mm		1268




## Clamping devices for automation

	3-place clamping pyramid	<b>NEW</b>	1272
	Centring clamp RS-Z	<b>NEW</b>	1273
	3-way clamping tower RS-T	<b>NEW</b>	1274

## Clamping devices

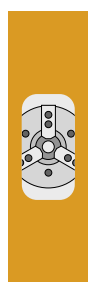
	Vacuum clamping technology		1275
	Zero-point clamping system		1278
	Eccentric clamps		1283
	Clamps, power clamps		1290
	Screw jacks		1295
	Hexagon nuts Screws for T-slots		1298
	Precision T-nuts		1302
	Toggle clamps		1307

## Magnetic clamping technology

	Small magnets		1311
	Permanent magnetic clamping plates		1316
	Permanent lifting magnets		1317

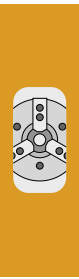
## Hoists

	Lifting straps, lever hoists		1318
--	------------------------------	--	------



ANYONE CAN DO  
**STANDARD.**  
WE HELP YOU FIND  
**INDIVIDUAL**  
SOLUTIONS.

**THAT'S POWER TO PRODUCE**



**TOMBSTONES**  
with T-slot or hole matrix



**STANDARD AND LONG-STROKE  
HYDRAULIC CYLINDER**  
for CNC lathes



**HYDRAULIC AND  
PNEUMATIC CLAMPS**  
for automation



**CHUCKS**  
with box jaws



**CLAMPING FORCE  
MEASURING INSTRUMENTS**  
for checking the pull-in forces of  
clamping systems in machining  
spindles



**POWERED TOOLS**  
for special applications



**ROUND TABLES**  
for an additional fourth  
and fifth axis

## ROHM Fixed centre (centring point)

DIN 806

- **Morse taper, DIN 228**

- 60° point angle
- Ground surfaces

- **Versions:**

Full centre made from WS steel, fully ground  
 Full centre with carbide insert  
 Half centre made from WS steel, fully ground  
 Half centre with carbide insert

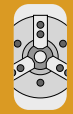
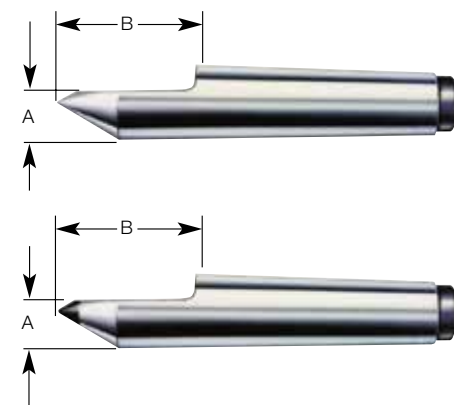
### Full centre

Shank	Ø mm	L mm	D mm	Weight kg	WS steel		Carbide	
					art.no.	€	art.no.	€
MT 1	12.2	80	-	0.06	401001 0001	35,-		
MT 2	18	100	-	0.15	401001 0002	35,-		
MT 2	18	100	7	0.155			401005 0002	88,10
MT3	24.1	125	-	0.34	401001 0003	46,80		
MT3	24.1	125	11	0.36			401005 0003	118,-
MT 4	31.6	160	-	0.79	401001 0004	64,50		
MT 4	31.6	160	14	0.77			401005 0004	164,-
MT 5	44.7	200	-	1.92	401001 0005	118,-		
MT 5	44.7	200	18	1.95			401005 0005	295,-
					4187		4187	



### Half centre

Shank	Ø mm	L mm	A mm	B mm	WS steel		Carbide	
					art.no.	€	art.no.	€
MT 2	18	100	11	30	401010 0002	52,60	401015 0002	131,50
MT3	24.1	125	15	38	401010 0003	70,40	401015 0003	176,-
MT 4	31.6	160	21	50	401010 0004	97,80	401015 0004	248,-
MT 5	44.7	200	29.4	63	401010 0005	176,-	401015 0005	445,-
					4187		4187	



## Tailstock for dividing attachments and rotary tables

- **With sleeve MT3**

- Ultra-precise design
- No height adjustment
- For mounting MT3 centring points (not supplied)



### Tailstock with slot size 18 H7

A mm	B mm	C mm	E mm	F mm	G mm	H mm	I mm	J mm	N mm	f mm	g mm	h mm	r mm	Weight kg	art.no.	€
135	Ø14	55	125	215	332	25	25	109	120	40	69	44	80	21	458053 0135	709,-
160	Ø18	55	140	230	356	30	30	129	130	45	70	52	95	23	458053 0160	819,-
210	Ø18	55	140	230	356	30	30	129	146	45	70	52	95	29.4	458053 0210	869,-

4166



## Live lathe centres, spring-loaded

- Replaceable centre inserts, straight shank
- Spring-loaded version for axial longitudinal displacement when machining
- Fully hardened and ground
- Maintenance-free permanent lubrication
- Shaft sealing ring prevents the ingress of dirt and coolant

### Spring stroke 2.4 mm

- Ejecting drift for replacing inserts
- Supplied without insert

Shank Ø mm	D mm	d mm	d1 mm	d2 mm	L mm	l1 mm	l2 mm	max. speed r/min	Workpiece weight max. kg	True running accuracy mm	art.no.	€
3/4"	40	18	19.05	12	90	4	38	4000	200	max. 0.01	<b>401525 0001</b>	<b>275,-</b>
19	40	18	19	12	90	4	38	4000	200	max. 0.01	401525 0002	275,-
20	40	18	20	12	90	4	38	4000	200	max. 0.01	401525 0003	275,-

4110

### Spring stroke 3.0 mm

- Inserts are replaced by twisting in opposite directions using two open-end spanners on the flats of the axis and insert (AF size 17)

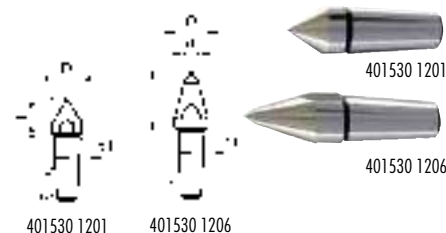
Shank Ø mm	D mm	d mm	d1 mm	d2 mm	L mm	l1 mm	l2 mm	Rotational speed max. r/min	Workpiece weight max. kg	True running accuracy mm	art.no.	€
1"	44	20	25.4	12	118	10	51	3000	300	max. 0.01	<b>401525 0004</b>	<b>280,-</b>
20	44	20	20	12	118	10	51	3000	300	max. 0.01	401525 0005	280,-
25	44	20	25	12	118	10	51	3000	300	max. 0.01	401525 0006	280,-

4110

### Replaceable inserts

Description	D mm	d mm	d1 mm	L mm	art.no.	€
Pointed centre	14	-	12	20	<b>401530 1201</b>	<b>18,05</b>
Copying centre	14	4	12	32	401530 1206	21,60

4110



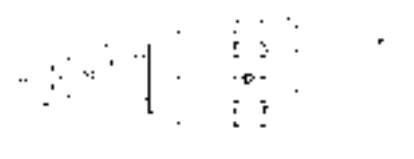
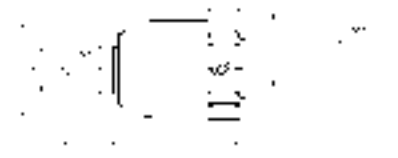
## Live precision lathe centres

- High-performance design specially for CNC lathes
- Draw-off nut to company standards
- For high speeds and axial loads
- Excellent true-running accuracy thanks to the high-end bearing
- Fully hardened and ground
- Maintenance-free permanent lubrication
- Shaft sealing ring prevents the ingress of dirt and coolant
- With additional sealing, also suitable for grinding applications

### Standard version

Shank	D mm	d mm	d1 mm	L mm	l1 mm	l2 mm	max. speed r/min	Workpiece weight max. kg	True running accuracy mm	art.no.	€
MT3	52	25	23.83	94	30	57	12000	300	max. 0.003	<b>401520 0003</b>	<b>589,-</b>
MT 4	60	28	31.27	106	35	63	10000	600	max. 0.003	401520 0004	609,-
MT 5	72	35	44.4	136	43	82	8000	1200	max. 0.003	401520 0005	769,-

4110



### Slim version

Shank	D mm	d mm	d1 mm	L mm	l1 mm	l2 mm	d3 mm	max. speed r/min	Workpiece weight max. kg	True running accuracy mm	art.no.	€
MT3	52	25	23.83	104	40	56	8	12000	200	max. 0.003	<b>401521 0003</b>	<b>609,-</b>
MT 4	60	28	31.27	116	45	63	8	10000	300	max. 0.003	401521 0004	609,-
MT 5	72	35	44.4	146	53	82	10	8000	800	max. 0.003	401521 0005	839,-

4110





## RÖHM Live centre

### Slim version, 60° point angle

- Body hardened and ground
- Small head diameter prevents any impairment of supports, tool holders or lathe tools

Shank	Projecting length mm	Head Ø mm	Moving point Ø x length mm	True running accuracy mm	Workpiece weight max. kg	max. speed r/min	art.no.	€
MT 2	62	32	15 x 18	0.005	200	7000	401501 0002	182,50
MT3	62	34	15 x 18	0.005	400	7000	401501 0003	189,50
MT 4	75.5	42	20 x 25	0.005	800	6300	401501 0004	253,-
MT 5	106	58	30 x 34	0.01	1600	4300	401501 0005	365,-
MT 6	143	80	42 x 49	0.02	3500	3000	401501 0006	729,-

4187



### Slim version with extended running point, 60° point angle

- Body hardened and ground

Shank	Projecting length mm	Head Ø mm	Moving point Ø x length mm	True running accuracy mm	Workpiece weight max. kg	max. speed r/min	art.no.	€
MT 2	73	32	15 x 29	0.008	170	7000	401505 0002	219,-
MT3	74	34	15 x 30	0.008	340	7000	401505 0003	228,-
MT 4	88.5	42	20 x 38	0.008	700	6300	401505 0004	304,-
MT 5	119	58	30 x 49	0.01	1400	4300	401505 0005	440,-
MT 6	164	80	42 x 70	0.02	3000	3000	401505 0006	879,-

4187



### Standard version, 60° point angle

Shank	Projecting length mm	Head Ø mm	Moving point Ø x length mm	True running accuracy mm	Workpiece weight max. kg	max. speed r/min	art.no.	€
MT 1	60.5	34.5	15 x 17	0.005	100	7000	401510 0001	226,-
MT 2	65	43	20 x 24	0.005	200	7000	401510 0002	226,-
MT3	79.5	58.5	25 x 31	0.005	500	5000	401510 0003	275,-
MT 4	102.5	68.5	32 x 41	0.005	800	3800	401510 0004	315,-
MT 5	129	88.5	40 x 50.5	0.005	2000	3000	401510 0005	460,-
MT 6	152	102.5	50 x 57.5	0.01	3500	2600	401510 0006	919,-

4187



## SARA® Live centres

- Excellent true-running accuracy thanks to reliable precision bearings
- Special lubrication for long service life and low maintenance costs
- 60° point angle

Shank	Projecting length mm	Head Ø mm	Moving point Ø x length mm	True running accuracy mm	Workpiece weight max. kg	max. speed r/min	art.no.	€
MT 2	65	45	20 x 41	0.005	200	4900	401516 0002	87,-
MT3	79.5	60	25 x 48.5	0.005	500	3500	401516 0003	104,-
MT 4	102.5	70	32 x 61.5	0.005	800	2700	401516 0004	125,50
MT 5	129	90	40 x 78.5	0.005	2000	2100	401516 0005	211,-

4111



# Clamping technology info

- **Front face driver for turning and milling work**
- for efficiently turning workpieces along their entire length with high accuracy and without reclamping
- simultaneously allows slots or tooling to be milled
- developed with a modular concept, making the driving discs and corresponding centring points universally replaceable
- **available on request**



## ROHM Live centre

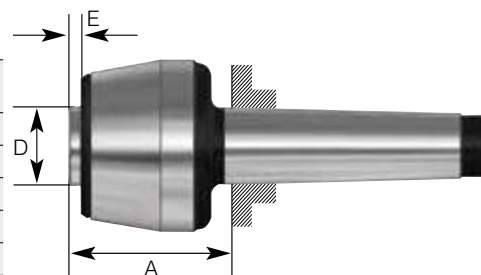
- With replaceable inserts

### Live centre

- For replaceable inserts (supplied without inserts)

Shank	Total length mm	A mm	D mm	E mm	Workpiece weight max. kg	True running accuracy mm	art.no.	€
MT 2	109	45	20	4	40	0.01	401550 0020	226,-
MT3	128.5	48	22	4.5	130	0.01	401550 0030	235,-
MT3	135.5	55	25	5	150	0.01	401550 0031	275,-
MT 4	169.5	67	32	5	250	0.01	401550 0040	315,-
MT 5	214	85	40	6	650	0.01	401550 0050	460,-

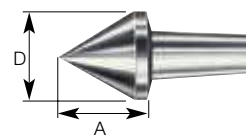
4187



### Replaceable inserts, 60°

suitable for centre punch tip	D mm	A mm	art.no.	€
401550 0020	16	20	401551 6020	29,10
401550 0030	20	24	401551 6030	35,-
401550 0031	24	27.5	401551 6031	40,90
401550 0040	28	31.5	401551 6040	46,80
401550 0050	38	43	401551 6050	58,60

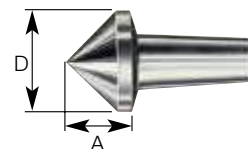
4187



### Replaceable inserts, 90°

suitable for centre punch tip	D mm	A mm	art.no.	€
401550 0020	16	14.5	401551 9020	29,10
401550 0030	20	16.5	401551 9030	35,-
401550 0031	24	19	401551 9031	40,90
401550 0040	28	21.5	401551 9040	46,80
401550 0050	38	29	401551 9050	58,60

4187



### Set of 7 replaceable inserts in a wooden box

- Contents

1x centring point; 60°, 90° insert (1 of each); 2 x hollow 60° internal taper; 1x blunt 60° external taper; 1x 60°/30° insert

Shank	Workpiece weight max. kg	art.no.	€
MT 2	40	401552 0200	569,-
MT3	130	401552 0300	649,-
MT3	150	401552 0301	729,-
MT 4	250	401552 0400	849,-
MT 5	650	401552 0500	1.119,-

4187



## Live precision centring taper

- For machining tubes and hollow bodies with large bores and centres
- Fully hardened and ground
- Maintenance-free permanent lubrication
- Shaft sealing ring prevents the ingress of dirt and coolant

Shank	D mm	d mm	d1 mm	L mm	l1 mm	α mm	Rotational speed max. r/min	Workpiece weight D max. kg	Workpiece weight d max. kg	True running accuracy mm	art.no.	€
MT3	80	30	23.82	86	78	60°	3500	450	250	max. 0.005	401531 0003	214,-
MT 4	100	30	31.26	101	92	75°	3000	650	300	max. 0.005	401531 0004	290,-
MT 5	125	50	44.39	92	82	75°	3000	1800	1400	max. 0.007	401531 0005	360,-
MT 6	150	50	63.34	112	102	75°	2800	2800	2000	max. 0.01	401531 0006	485,-

4110





## ATORN® Live centre, extended running point

- 60° point angle
- Extended running point
- Perfect all-purpose point for universal use on manual lathes
- Radial run-out: max. 0.005 mm
- Fully hardened and ground tool
- Bearing arrangement for high axial forces
- Shaft sealing ring prevents the ingress of dirt and coolant

Shank	A mm	B mm	C mm	D mm	E mm	F mm	max. speed r/min	Workpiece weight max. kg	art.no.	€
MT 2	54	13	17.78	68.5	86.5	150.5	4200	170	401503 0002	311,-
MT3	54	13	23.83	68.5	86.5	167.5	4200	170	401503 0003	335,-
MT3	64	16	23.83	78	100	181	3800	330	401503 0013	360,-
MT 4	64	16	31.27	78	100	202.5	3800	330	401503 0004	395,-
MT 4	86	19	31.27	93.5	121.5	224	3200	550	401503 0014	470,-
MT 5	86	19	44.40	93.5	121.5	251	3200	550	401503 0005	529,-

4123



Easy to use for tubes with large diameters



The extended running point guarantees the required clearance angle for turning parts with small diameters.



Ideal for bar stock with large diameters



# Clamping jaw finder



- Jaws for approx. 3,000 different chuck types
- Find the right jaws for your chuck quickly and easily.
- Easy to find and quick to order with lightning-fast delivery!

[www.spannbackenfinder.de](http://www.spannbackenfinder.de)



## Universal lathe chuck

- **Chuck body made from cast iron or steel**
- Suitable for lathes as well as all types of milling and drilling devices
- Straight or with direct mounting
- Guides and wear surfaces ground
- Flat spiral ring made from high-quality alloy steel, die-forged and hardened
- **Supplied with:**
  - Includes chuck key and attachment screws
  - 1 set of boring jaws (stepped outward)
  - 1 set of turning jaws (stepped inward)



### Three-jaw chuck, cast design

- **DIN 6350** with straight centre mount

Chuck Ø mm	Holding fixture Ø mm	Support depth mm	Chuck height (without jaws)	Clearance hole mm	Rotational speed max. r/min	Weight kg	art.no.	€
100	70	3	50	20	3500	2.8	<b>405101 0100</b>	<b>221,-</b>
125	95	4	56	32	3200	5	405101 0125	234,-
160	125	4	64	42	3000	10	405101 0160	260,-
200	160	4	75	55	2500	16.6	405101 0200	320,-
250	200	5	85	76	2000	29	405101 0250	435,-
315	260	5	94	103	1500	50	405101 0315	669,-

4113

### Four-jaw chuck, cast design

- **DIN 6350** with straight centre mount

Chuck Ø mm	Holding fixture Ø mm	Support depth mm	Chuck height (without jaws)	Clearance hole mm	Rotational speed max. r/min	Weight kg	art.no.	€
100	70	3	50	20	3500	2.8	<b>405102 0100</b>	<b>239,-</b>
125	95	4	56	32	3200	5	405102 0125	262,-
160	125	4	64	42	3000	10	405102 0160	310,-
200	160	4	75	55	2500	17.5	405102 0200	365,-
250	200	5	85	76	2000	29	405102 0250	529,-
315	260	5	94	103	1500	50	405102 0315	759,-

4113

### Three-jaw chuck, steel design

- **DIN 6350** with straight centre mount

Chuck Ø mm	Holding fixture Ø mm	Support depth mm	Chuck height (without jaws)	Clearance hole mm	Rotational speed max. r/min	Weight kg	art.no.	€
100	70	3	50	20	5200	2.8	<b>405111 0100</b>	<b>335,-</b>
125	95	4	59.5	35.5	4800	5	405111 0125	380,-
160	125	4	68	42	4500	10	405111 0160	435,-
200	160	4	78	55	4000	17.5	405111 0200	559,-
250	200	5	89	76	3500	29	405111 0250	759,-
315	260	5	96.2	103	2800	50	405111 0315	1.169,-

4113

### Four-jaw chuck, steel design

- **DIN 6350** with straight centre mount

Chuck Ø mm	Holding fixture Ø mm	Support depth mm	Chuck height (without jaws)	Clearance hole mm	Rotational speed max. r/min	Weight kg	art.no.	€
100	70	3	50	20	5200	2.8	<b>405112 0100</b>	<b>385,-</b>
125	95	4	59.5	35.5	4800	5	405112 0125	460,-
160	125	4	68	42	4500	10	405112 0160	519,-
200	160	4	78	55	4000	17.5	405112 0200	669,-
250	200	5	89	76	3500	29	405112 0250	889,-
315	260	5	96.2	103	2800	50	405112 0315	1.379,-

4113

**Three-jaw chuck, steel design**

- **DIN 55027** with short taper holder
- Includes stay bolt and collar nut

Chuck Ø mm	Taper support	Chuck height (without jaws)	Clearance hole mm	Rotational speed max. r/min	Weight kg	art.no.	€
125	A2-3	59.5	35.5	4800	5	<b>405113</b> 3125	455,-
125	A2-4	59.5	35.5	4800	5	405113 4125	455,-
160	A2-4	68	55	4500	9	405113 4160	529,-
160	A2-5	68	55	4500	9	405113 5160	529,-
200	A2-5	78	55	4000	19	405113 5200	679,-
200	A2-6	78	55	4000	19	405113 6200	679,-
250	A2-6	89	76	3500	32	405113 6250	889,-
250	A2-8	89	76	3500	32	405113 8250	889,-
315	A2-6	96.2	103	2800	51	405113 6315	1.319,-
315	A2-8	96.2	103	2800	51	405113 8135	1.319,-

4113

**Four-jaw chuck, steel design**

- **DIN 55027** with short taper holder
- Includes stay bolt and collar nut

Chuck Ø mm	Taper support	Chuck height (without jaws)	Clearance hole mm	Rotational speed max. r/min	Weight kg	art.no.	€
125	A2-3	59.5	35.5	4800	5	<b>405114</b> 3125	609,-
125	A2-4	59.5	35.5	4800	5	405114 4125	609,-
160	A2-4	68	42	4500	9	405114 4160	689,-
160	A2-5	68	42	4500	9	405114 5160	689,-
200	A2-5	78	55	4000	19	405114 6200	879,-
200	A2-6	78	55	4000	19	405114 8200	879,-
250	A2-6	89	76	3500	32	405114 6250	1.169,-
250	A2-8	89	76	3500	32	405114 8250	1.169,-
315	A2-6	96.2	76	2800	32	405114 6315	1.839,-
315	A2-8	96.2	76	2800	32	405114 8315	1.839,-

4113

**Three-jaw chuck, steel design**

- **DIN 55029 (Camlock)** with short taper holder
- Includes Camlock bolt

Chuck Ø mm	Taper support	Chuck height (without jaws)	Clearance hole mm	Rotational speed max. r/min	Weight kg	art.no.	€
125	A2-3	59.5	35.5	4800	5	<b>405115</b> 3125	495,-
125	A2-4	59.5	35.5	4800	5	405115 4125	495,-
160	A2-4	68	42	4500	9	405115 4160	579,-
160	A2-5	68	42	4500	9	405115 5160	579,-
200	A2-5	78	55	4000	19	405115 5200	709,-
200	A2-6	78	55	4000	19	405115 6200	709,-
250	A2-6	89	76	3500	32	405115 6250	959,-
250	A2-8	89	76	3500	32	405115 8250	959,-
315	A2-6	96.2	103	2800	51	405115 6315	1.489,-
315	A2-8	96.2	103	2800	51	405115 8315	1.489,-

4113

**Four-jaw chuck, steel design**

- **DIN 55029 (Camlock)** with short taper holder
- Includes Camlock bolt

Chuck Ø mm	Taper support	Chuck height (without jaws)	Clearance hole mm	Rotational speed max. r/min	Weight kg	art.no.	€
125	A2-3	59.5	35.5	4800	5	<b>405116</b> 3125	609,-
125	A2-4	59.5	35.5	4800	5	405116 4125	609,-
160	A2-4	68	42	4500	9	405116 4160	699,-
160	A2-5	68	42	4500	9	405116 5160	699,-
200	A2-5	78	55	4000	19	405116 5200	899,-
200	A2-6	78	55	4000	19	405116 6200	899,-
250	A2-6	89	76	3500	32	405116 6250	1.169,-
250	A2-8	89	76	3500	32	405116 8250	1.169,-
315	A2-6	96.2	103	2800	51	405116 6315	1.769,-
315	A2-8	96.2	103	2800	51	405116 8315	1.769,-

4113

Continued on next page &gt;&gt;&gt;



**Turning jaws, hardened**

- Price per set

for chuck Ø mm	L mm	Width mm	Height mm	Satz à 3 Backen		Satz à 4 Backen	
				art.no.	€	art.no.	€
100	42	15	32	<b>405103</b> 3100	<b>82,40</b>	<b>405103</b> 4100	<b>127,50</b>
125	51	20	40	405103 3125	<b>85,50</b>	405103 4125	<b>136,-</b>
160	70	20	53	405103 3160	<b>99,70</b>	405103 4160	<b>156,50</b>
200	85	25	54	405103 3200	<b>106,-</b>	405103 4200	<b>167,-</b>
250	105	28	63	405103 3250	<b>136,-</b>	405103 4250	<b>206,-</b>
315	125	32	73	405103 3315	<b>214,-</b>	405103 4315	<b>338,-</b>
				4113		4113	

**Boring jaws, hardened**

- Price per set

for chuck Ø mm	L mm	Width mm	Height mm	Satz à 3 Backen		Satz à 4 Backen	
				art.no.	€	art.no.	€
100	42	15	32	<b>405104</b> 3100	<b>82,40</b>	<b>405104</b> 4100	<b>127,50</b>
125	51	20	40	405104 3125	<b>85,50</b>	405104 4125	<b>136,-</b>
160	70	20	53	405104 3160	<b>99,70</b>	405104 4160	<b>156,50</b>
200	85	25	54	405104 3200	<b>106,-</b>	405104 4200	<b>167,-</b>
250	105	28	63	405104 3250	<b>136,-</b>	405104 4250	<b>206,-</b>
315	125	32	73	405104 3315	<b>214,-</b>	405104 4315	<b>338,-</b>
				4113		4113	

**Unstepped block jaws**

- Material 1.0503 (C45)

- Price per set

for chuck Ø mm	L mm	Width mm	Height mm	Satz à 3 Backen		Satz à 4 Backen	
				art.no.	€	art.no.	€
100	42	15	32	<b>405107</b> 3100	<b>60,10</b>	<b>405107</b> 4100	<b>95,10</b>
125	51	20	40	405107 3125	<b>60,10</b>	405107 4125	<b>95,10</b>
160	70	20	53	405107 3160	<b>76,30</b>	405107 4160	<b>109,50</b>
200	78	25	58	405107 3200	<b>90,10</b>	405107 4200	<b>131,-</b>
250	96	28	68	405107 3250	<b>119,-</b>	405107 4250	<b>172,50</b>
315	118	32	78	405107 3315	<b>169,-</b>	405107 4315	<b>259,-</b>
				4113		4113	

**Base jaws, hardened**

- Price per set

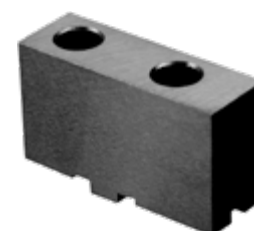
for chuck Ø mm	L mm	Width mm	Height mm	Satz à 3 Backen		Satz à 4 Backen	
				art.no.	€	art.no.	€
125	54	20	28	<b>405105</b> 3125	<b>94,10</b>	<b>405105</b> 4125	<b>133,-</b>
160	65	20	29	405105 3160	<b>95,10</b>	405105 4160	<b>148,50</b>
200	79	25	33	405105 3200	<b>111,50</b>	405105 4200	<b>172,50</b>
250	92	28	36	405105 3250	<b>132,-</b>	405105 4250	<b>208,-</b>
315	110	32	40	405105 3315	<b>199,-</b>	405105 4315	<b>314,-</b>
				4113		4113	

**Soft top jaws**

- Material 1.0503 (C45)

- Price per set

for chuck Ø mm	L mm	Width mm	Height mm	Satz à 3 Backen		Satz à 4 Backen	
				art.no.	€	art.no.	€
125	64	22	38.5	<b>405106</b> 3125	<b>50,40</b>	<b>405106</b> 4125	<b>67,70</b>
160	78	25	41.5	405106 3160	<b>58,-</b>	405106 4160	<b>78,40</b>
200	90	27	43.5	405106 3200	<b>60,10</b>	405106 4200	<b>79,40</b>
250	106	32	51.5	405106 3250	<b>83,40</b>	405106 4250	<b>111,50</b>
315	120	37	55	405106 3315	<b>117,50</b>	405106 4315	<b>156,50</b>
				4113		4113	



## Flange for lathe chucks and face plates

- **DIN 55026 with through-hole for direct connection to the spindle head**
- **DIN 55027 for bayonet-type disc fastening with stay bolts and collar nut**
- **DIN 55029 Camlock version with Camlock bolt**
- Steel design
- Machined on the machine side
- Faced on the chuck side
- Other taper and chuck sizes available on request

### DIN 55026

- Short taper holder machined in accordance with DIN 55026 (A2)
- Faced on the chuck side
- Without attachment screws

for chuck Ø mm	Taper size	A mm	B mm	Clearance hole mm	art.no.	€
160	5	162	23	79.5	<b>405026</b> 1605	107,-
200	5	203	23	79.5	405026 2005	153,-
200	6	203	23	103	405026 2006	153,-
250	6	253	28	103	405026 2506	198,50
250	8	253	28	136.2	405026 2508	198,50
315	6	318	35	103	405026 3106	346,-
315	8	318	35	136.2	405026 3108	346,-
400	6	405	35	103	405026 4006	539,-
400	8	405	35	136.2	405026 4008	539,-

4174

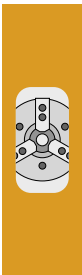
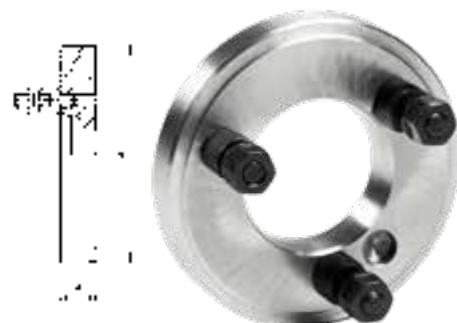


### DIN 55027

- Short taper holder machined in accordance with DIN 55026
- Faced on the chuck side
- Includes stay bolt and collar nut

for chuck Ø mm	Taper size	A mm	B mm	Clearance hole mm	art.no.	€
125	3	127	20	51.4	<b>405027</b> 1203	101,-
125	4	127	20	61	405027 1204	101,-
160	4	162	23	61	405027 1604	107,-
160	5	162	23	79.5	405027 1605	107,-
200	5	203	23	79.5	405027 2005	153,-
200	6	203	23	103	405027 2006	153,-
250	6	253	28	103	405027 2506	198,50
250	8	253	28	136.2	405027 2508	198,50
315	6	318	35	103	405027 3106	346,-
315	8	318	35	136.2	405027 3108	346,-
400	8	405	35	136.2	405027 4008	559,-
400	11	405	35	192.8	405027 4011	559,-

4174

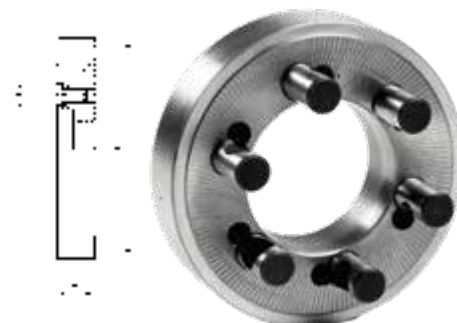


### DIN 55029 Camlock

- Short taper holder machined in accordance with DIN 55029 Camlock
- Faced on the chuck side
- Includes Camlock bolt

for chuck Ø mm	Taper size	A mm	B mm	Clearance hole mm	art.no.	€
125	3	127	28	51.4	<b>405029</b> 1203	101,-
125	4	127	28	61	405029 1204	101,-
160	4	162	29	61	405029 1604	107,-
160	5	162	32	79.5	405029 1605	107,-
200	5	203	32	79.5	405029 2005	153,-
200	6	203	39	103	405029 2006	153,-
250	6	253	39	103	405029 2506	198,50
250	8	253	42	136.2	405029 2508	198,50
315	6	318	42	103	405029 3106	355,-
315	8	318	45	136.2	405029 3108	355,-
400	8	405	45	136.2	405029 4008	619,-
400	11	405	49	192.8	405029 4011	689,-

4174



## ROHM Universal lathe chuck ZS

- Die-forged steel body and spiral ring
- High clamping force
- Extra-low design for minimal protruding contours
- Chuck jaws ground-off for smooth running
- Balanced out and hardened
- **Supplied with socket spanner, drilling and turning jaws**
- **Additional versions available on request**

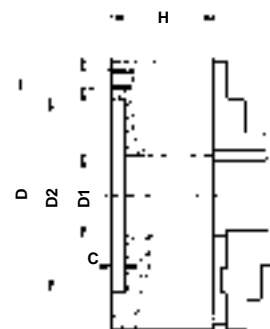


### Lathe chuck with straight holding fixture in accordance with DIN 6350

Chuck Ø mm	D mm	D1 mm	D2 mm	H mm	C mm	G mm	Three-jaw chuck art.no.	€	Four-jaw chuck art.no.	€
80	67	19	56	39.5	3	3 x M6	407102 0080	395,-		
100	83	20	70	50	3	3 x M8	407102 0100	430,-	409102 0100	509,-
125	108	32	95	56	4	3 x M8	407102 0125	539,-	409102 0125	629,-
160	140	42	125	65	4	3 x M10	407102 0160	689,-	409102 0160	809,-
200	176	55	160	73.5	4	3 x M10	407102 0200	909,-	409102 0200	1.059,-
250	224	76	200	82	5	3 x M12	407102 0250	1.179,-	409102 0250	1.389,-
315	286	103	260	95	5	3 x M16	407102 0315	1.749,-	409102 0315	2.069,-

4189

4189

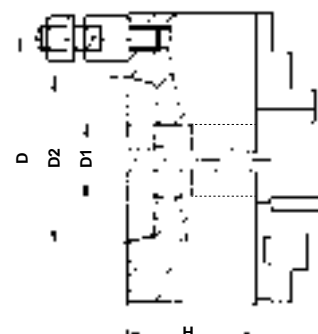


### Lathe chuck with stay bolts and collar nut according to DIN 55027

Chuck Ø mm	Taper size	D mm	D1 mm	D2 mm	H mm	Three-jaw chuck art.no.	€	Four-jaw chuck art.no.	€
125	4	85	32	63.5	69	407105 4125	569,-	409105 4125	669,-
160	4	85	42	63.5	66	407105 4160	729,-	409105 4160	849,-
160	5	104.8	42	82.5	66	407105 5160	729,-	409105 5160	849,-
200	5	104.8	55	82.5	74.5	407105 5200	949,-	409105 5200	1.109,-
200	6	133.4	55	106.4	74.5	407105 6200	949,-	409105 6200	1.109,-
250	6	133.4	76	106.4	83	407105 6250	1.249,-	409105 6250	1.469,-
250	8	171.4	76	139.7	83	407105 8250	1.249,-	409105 8250	1.469,-
315	6	133.4	103	106.4	96	407105 6315	1.849,-	409105 6315	2.169,-
315	8	171.4	103	139.7	96	407105 8315	1.849,-	409105 8315	2.169,-
315	11	235	103	196.9	96	407105 1315	1.849,-	409105 8400	2.169,-

4189

4189

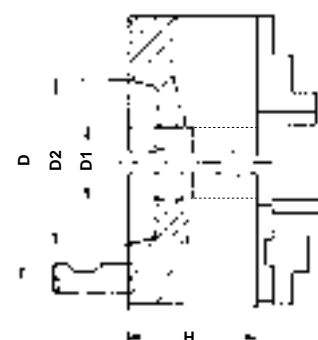


### Lathe chuck with stay bolts for Camlock according to DIN 55029

Chuck Ø mm	Taper size	D mm	D1 mm	D2 mm	H mm	Three-jaw chuck art.no.	€	Four-jaw chuck art.no.	€
125	4	82.5	32	63.5	69	407106 4125	589,-	409106 4125	699,-
160	4	82.5	42	63.5	66	407106 4160	759,-	409106 4160	889,-
160	5	104.8	42	82.5	66	407106 5160	759,-	409106 5160	889,-
200	5	104.8	55	82.5	74.5	407106 5200	989,-	409106 5200	1.159,-
200	6	133.4	55	106.4	74.5	407106 6200	989,-	409106 6200	1.159,-
250	6	133.4	76	106.4	83	407106 6250	1.299,-	409106 6250	1.529,-
250	8	171.4	76	139.7	83	407106 8250	1.299,-	409106 8250	1.529,-
315	8	171.4	103	139.7	96	407106 8315	1.939,-	409106 8315	2.269,-
315	11	235	103	196.9	104	407106 1315	1.939,-	409106 1315	2.269,-

4189

4189





**Boring jaws BB**

- hardened
- Suitable for Röhms ZS and ZG lathe chucks
- Material 16MnCr5
- Price per set

for chuck Ø mm	L mm	B mm	H mm	Three-jaw chuck		Four-jaw chuck	
				art.no.	€	art.no.	€
80	37	12	26	<b>421019 0080</b>	130,50	<b>421119 0080</b>	175,-
100	48	14	33.5	421019 0100	130,50	421119 0100	175,-
125	52	18	41.5	421019 0125	130,50	421119 0125	175,-
160	61	18	47.5	421019 0160	144,50	421119 0160	192,50
200	69	20	53.5	421019 0200	170,-	421119 0200	228,-
250	90	24	67.5	421019 0250	199,50	421119 0250	266,-
315	130	34	79.5	421019 0315	299,-	421119 0315	399,-
				4189		4189	

**Turning jaws DB**

- hardened
- Suitable for Röhms ZS and ZG lathe chucks
- Material 16MnCr5
- Price per set

for chuck Ø mm	L mm	B mm	H mm	Three-jaw chuck		Four-jaw chuck	
				art.no.	€	art.no.	€
80	37	12	26	<b>421018 0080</b>	130,50	<b>421118 0080</b>	175,-
100	48	14	33.5	421018 0100	130,50	421118 0100	175,-
125	52	18	41.5	421018 0125	130,50	421118 0125	175,-
160	61	18	47.5	421018 0160	144,50	421118 0160	192,50
200	69	20	53.5	421018 0200	170,-	421118 0200	228,-
250	90	24	67.5	421018 0250	199,50	421118 0250	266,-
315	130	34	79.5	421018 0315	299,-	421118 0315	399,-
				4189		4189	

**Block jaws BL**

- can be hardened
- Suitable for Röhms ZS and ZG lathe chucks
- Material 16MnCr5
- Price per set

for chuck Ø mm	L mm	B mm	H mm	Three-jaw chuck		Four-jaw chuck	
				art.no.	€	art.no.	€
80	37	12	26	<b>421210 0080</b>	87,60	<b>421211 0080</b>	118,-
100	48	14	33.5	421210 0100	87,60	421211 0100	118,-
125	52	18	41.5	421210 0125	87,60	421211 0125	118,-
160	61	18	47.5	421210 0160	95,90	421211 0160	127,50
200	69	20	53.5	421210 0200	115,-	421211 0200	153,-
250	90	24	67.5	421210 0250	131,50	421211 0250	178,-
315	130	34	79.5	421210 0315	199,50	421211 0315	266,-
				4189		4189	

**Base jaws GB**

- hardened
- Suitable for Röhms ZS and ZG lathe chucks
- including cylinder screws DIN 912-12.9
- Material 16MnCr5
- Price per set

for chuck Ø mm	L mm	B mm	H mm	Three-jaw chuck		Four-jaw chuck	
				art.no.	€	art.no.	€
100	46	14	19.5	<b>421015 0100</b>	216,-	<b>421115 0100</b>	289,-
125	55	18	24	421015 0125	216,-	421115 0125	289,-
160	65	18	27	421015 0160	216,-	421115 0160	289,-
200	78	20	28	421015 0200	226,-	421115 0200	303,-
250	92	24	35	421015 0250	237,-	421115 0250	317,-
315	108	34	40	421015 0315	360,-	421115 0315	480,-
				4189		4189	



Continued on next page &gt;&gt;&gt;



**Reversible top jaws UB**

- hardened
- Suitable for Röhms ZS and ZG lathe chucks
- Material 16MnCr5
- Price per set

for chuck Ø mm	L mm	B mm	H mm	Three-jaw chuck		Four-jaw chuck	
				art.no.	€	art.no.	€
100	47	22	29.5	<b>421017 0100</b>	<b>181,50</b>	<b>421117 0100</b>	<b>241,-</b>
125	56	26	37.5	421017 0125	181,50	421117 0125	241,-
160	66.7	28	41.5	421017 0160	181,50	421117 0160	241,-
200	79.5	30	42.5	421017 0200	188,50	421117 0200	252,-
250	95.3	36	52.5	421017 0250	199,50	421117 0250	266,-
315	109.5	42	57.5	421017 0315	299,-	421117 0315	399,-
				4189		4189	



**Unstepped top jaws AB**

- can be hardened, with cross tenon
- Suitable for Röhms ZS and ZG lathe chucks
- Material 16MnCr5
- Price per set

for chuck Ø mm	L mm	B mm	H mm	Three-jaw chuck		Four-jaw chuck	
				art.no.	€	art.no.	€
100	53	22.5	30	<b>421016 0100</b>	<b>66,30</b>	<b>421116 0100</b>	<b>88,70</b>
125	62	26.5	38	421016 0125	66,30	421116 0125	88,70
160	74	28.5	42	421016 0160	40,90	421116 0160	54,60
200	87	30.5	43	421016 0200	43,20	421116 0200	58,-
250	103	36.5	53	421016 0250	66,30	421116 0250	88,70
315	120	42.5	58	421016 0315	99,50	421116 0315	131,50
				4189		4189	



**RÖHM Wedge bar chuck DURO-T**

**DIN 6350A**   **DIN 55027**

- With jaw safety mechanism, centric clamping
- Higher clamping forces
- Stiffer chuck body (guaranteed accuracy at higher loads)
- Chuck body fully surface-hardened
- High jaw change repeatability
- Optimised wearing parts (e.g. safety shut-off valve)
- True running and axial run-out tolerance twice as accurate as specified by DIN accuracy class 1
- Enhanced corrosion protection
- Compatible with base and top jaws from other manufacturers
- Supplied with safety key (as demanded by EN 1550), set of reversible one-piece jaws or set of base jaws with reversible top jaws

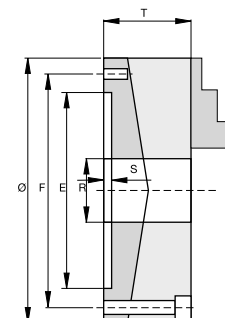


**With straight centre mount, DIN 6350 A**

Ø mm	Clamping range mm	R mm	T mm	E H6 mm	S mm	F mm	Weight kg	with reversible jaws art.no.	€	Sliding + top jaws. art.no.	€
160	5 - 161	42	63	145	5	125	9.5	<b>405012 0160</b>	<b>2.099,-</b>	<b>405013 0160</b>	<b>2.219,-</b>
200	7 - 207	52	81	185	5	160	20	405012 0200	2.259,-	405013 0200	2.379,-
250	8 - 253	62	92	235	6	200	35	405012 0250	2.959,-	405013 0250	3.099,-
315	12 - 323	87	111	300	6	250	64	405012 0315	4.399,-	405013 0315	5.059,-
								4189		4189	

**With short taper holding fixture, DIN 55027**

Ø mm	Clamping range mm	R mm	T mm	Taper size	Largest taper Ø mm	Weight kg	with reversible jaws art.no.	€	Sliding + top jaws. art.no.	€
160	5 - 161	42	63	5	82.563	9.5	<b>405014 1160</b>	<b>2.199,-</b>	<b>405015 1160</b>	<b>2.539,-</b>
200	7 - 207	52	81	5	82.563	20	405014 0200	2.379,-	405015 0200	2.739,-
200	7 - 207	52	81	6	106.375	20	405014 1200	2.379,-	405015 1200	2.739,-
250	8 - 253	62	92	6	106.375	35	405014 0250	3.099,-	405015 0250	3.589,-
250	8 - 253	62	92	8	139.719	35	405014 1250	3.099,-	405015 1250	3.589,-
315	12 - 323	87	111	8	139.719	64	405014 1315	4.629,-	405015 1315	5.319,-
							4189		4189	



**One-piece block jaw, unstepped, can be hardened**

- Suitable for RÖHM-DURO, FORKARDT-F and SCHUNK-ROTA-S
- Price per 3-piece set

suitable for chuck size	L mm	B mm	H mm	art.no.	€
160	84.4	20	45	<b>420130 0160</b>	<b>239,-</b>
200	98.4	22	60	420130 0200	252,-
250	118.7	26	70	420130 0250	265,-
315	136.6	32	79	420130 0315	399,-

4189

**One-piece reversible jaw, hardened**

- Suitable for RÖHM-DURO, FORKARDT-F and SCHUNK-ROTA-S
- Price per 3-piece set

suitable for chuck size	L mm	B mm	H mm	Step height mm	Type	art.no.	€
160	77.7	20	45	7.5	Three-level	<b>420180 0160</b>	<b>360,-</b>
200	94.7	22	60	10	Three-level	420180 0200	380,-
250	114	26	70	14	Two-level	420180 0250	399,-
315	130	32	79	15	Two-level	420180 0315	599,-

4189

**Top jaw, unstepped, can be hardened**

- Suitable for RÖHM-DURO, FORKARDT-F and SCHUNK-ROTA-S
- Price per 3-piece set

suitable for chuck size	L mm	B mm	H mm	Hole distance mm	Groove width mm	Weight kg	L1 mm	L2 mm	h1 mm	art.no.	€
160	85	20	40	32	8	1.2	25	18	35.5	<b>420215 0160</b>	<b>35,10</b>
200	105	22	51	40	10	2	34	20	47	420215 0200	43,10
250	125	30	55	40	12	3.6	36	20	50	420215 0250	69,-
315	145	40	60	54	12	5.8	45	26	54	420215 0315	95,-

4166

**Reversible top jaw, hardened**

- Suitable for RÖHM-DURO, FORKARDT-F and SCHUNK-ROTA-S
- Price per 3-piece set

suitable for chuck size	L mm	B mm	H mm	Hole distance mm	Step height mm	Groove width mm	art.no.	€
200	70.5	24.4	38	40	10	10	<b>420145 0200</b>	<b>188,50</b>
250	92	34.4	50	40	14	12	420145 0250	199,50
315	107	35.7	56	54	15	12	420145 0315	299,-

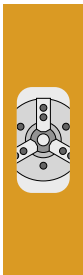
4189

**Base jaw, hardened**

- Suitable for RÖHM-DURO, FORKARDT-F and SCHUNK-ROTA-S
- Price per 3-piece set

suitable for chuck size	L mm	B mm	H mm	Hole distance mm	Groove width mm	L2 mm	art.no.	€
160	74	20	29.5	32	8	8	<b>420260 0160</b>	<b>216,-</b>
200	90	22	35	40	12	10	420260 0200	226,-
250	110	26	40	40	12	12	420260 0250	237,-
315	125	32	46	54	12	12	420260 0315	360,-

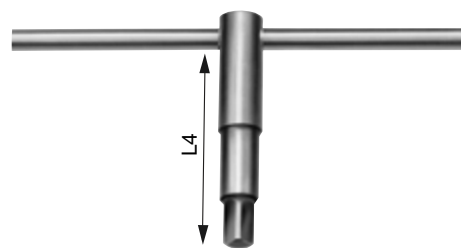
4166



## AMF Square pin key

**DIN  
905**

- Special steel
- Shank and cross bar hardened and tempered to a burnished shade
- Pressed-in cross bar



Wr. width mm	Lateral shank length mm	Head Ø mm	L4 mm	art.no.	€
4	160	12	60	401574 0004	19,25
5	160	12	60	401574 0005	17,75
6	160	12	80	401574 0006	18,55
7	160	14,6	80	401574 0007	21,80
8	180	16	80	401574 0008	20,-
9	180	16	80	401574 0009	21,30
10	200	20	100	401574 0010	24,80

4159

Wr. width mm	Lateral shank length mm	Head Ø mm	L4 mm	art.no.	€
11	200	20	100	401574 0011	25,70
12	250	24	100	401574 0012	26,90
13	250	24	100	401574 0013	30,30
14	320	28	120	401574 0014	32,20
17	400	34	160	401574 0017	50,70
19	400	36	200	401574 0019	60,20

4159

## AMF Square ring spanner

**DIN  
248**

- Special steel
- Hardened, tempered to a burnished tone
- Continuous interior quadratic



Wr. width mm	Head Ø mm	L mm	art.no.	€
8	17	160	401576 0008	32,-
10	21	195	401576 0010	33,70
12	24	235	401576 0012	36,20
14	27	270	401576 0014	41,80

4159

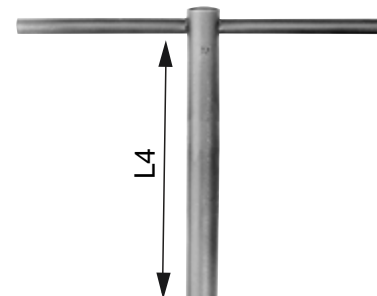
Wr. width mm	Head Ø mm	L mm	art.no.	€
17	31	315	401576 0017	62,50
19	35	345	401576 0019	68,-
22	39	385	401576 0022	84,40
24	43	415	401576 0024	89,20

4159

## AMF Square socket key

**DIN  
904**

- Special steel
- Shank and cross bar hardened and tempered to a burnished shade
- Pressed-in cross bar



Wr. width mm	Lateral shank length mm	Head Ø mm	L4 mm	art.no.	€
4	160	12	60	401572 0004	20,10
5	160	12	60	401572 0005	20,90
6	160	12	80	401572 0006	20,80
7	160	14,6	80	401572 0007	22,70
8	180	16	80	401572 0008	22,80
9	180	18	100	401572 0009	24,90

4159

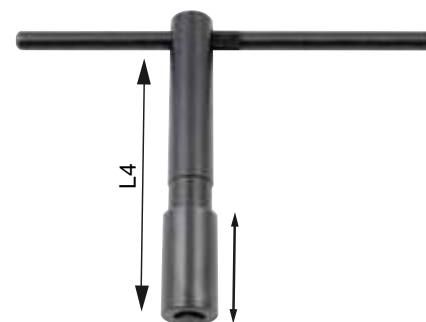
Wr. width mm	Lateral shank length mm	Head Ø mm	L4 mm	art.no.	€
10	200	20	100	401572 0010	25,20
12	250	24	100	401572 0012	31,-
14	320	28	120	401572 0014	40,70
17	400	34	160	401572 0017	59,20
19	400	36	200	401572 0019	66,10

4159

## RÖHM Safety square pin key

DIN 905

- Special steel
- Shank and cross bar hardened and tempered to a burnished shade
- Designed to avoid being accidentally left in the lathe chuck



Wr. width mm	L4 mm	for chuck Ø mm	art.no.	€
6	110	80 - 85	401571 0006	46,20
8	130	100 - 110	401571 0008	46,20
9	130	125 - 140	401571 0009	46,20
10	160	160	401571 0010	58,-
11	160	200 - 230	401571 0011	58,-

4189

Wr. width mm	L4 mm	for chuck Ø mm	art.no.	€
12	160	250 - 270	401571 0012	69,90
14	200	315	401571 0014	81,70
17	250	400	401571 0017	118,-
19	250	500 - 630	401571 0019	164,-

4189

## SARA® Hollow spindle stop

- **Not suitable for NC machines**
- Comprising clamping body, extension and special key
- For lathes
- For limiting lengths during one-off and mass production
- Special key for clamping in and releasing from the machine spindle

Clamping range mm	art.no.	€
20 - 27	421302 2027	115,-
25 - 33	421302 2533	133,50
32 - 41	421302 3241	141,50
40 - 50	421302 4050	166,-

4166

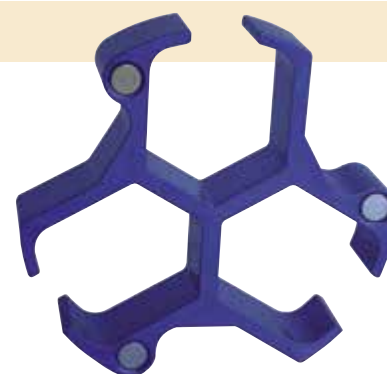
Clamping range mm	art.no.	€
48 - 60	421302 4860	187,50
58 - 76	421302 5876	219,-
75 - 96	421302 7596	305,-
94 - 110	421302 9411	375,-

4166



## Workpiece stop

- **For three-jaw chucks, for clamping short parts**
- Material: Aluminium
- Three magnets for easy attachment to the lathe chuck
- Ground supporting surfaces
- Suitable for three-jaw chucks with jaw widths up to 55 mm, for Ø 15 - 130 mm workpieces
- The dimension W=25mm, must be milled in accordance with the jaw width



### Individual

H mm	art.no.	€
15	421300 0015	69,70
20	421300 0020	69,70
25	421300 0025	76,30
30	421300 0030	76,30
35	421300 0035	78,90

4153

### Set in a wooden box

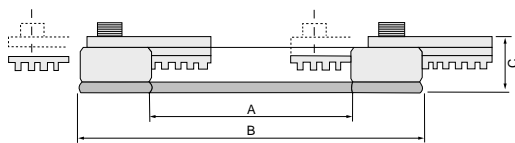
Contents per set	art.no.	€
Workpiece stop H = 15, 20, 25, 30, 35 mm (1 of each)	421301 1535	365,-

4153



## Unscrewing device for 3 jaw chucks

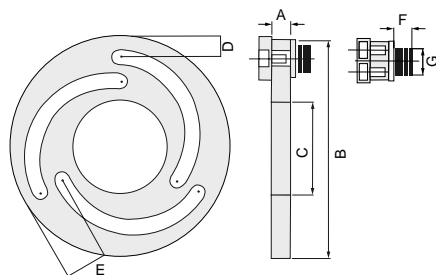
- For internal turning of soft turning jaws
- For regrinding hard turning jaws
- For external and internal workpiece clamping
- Infinitely variable adjusting range
- Quick diameter adjustment



### For manual chucks

for chuck Ø mm	A mm	B mm	C mm	Adjustment range mm	max. speed t/min	art.no.	€
125 - 200	100	170	26	56-124 / 134-200	800	421306 0006	579,-
160 - 250	125	200	26	85-150 / 170-230	700	421306 0008	619,-
200 - 315	160	248	31	100-190 / 220-300	600	421306 0010	749,-

4114



### For power chucks

for chuck Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	art.no.	€
135	12	140	60	12	28	9	13	421307 1005	229,-
170	12	168	80	12	32	9	16.5	421307 1006	255,-
210	12	218	115	15	36	9	18.5	421307 1008	280,-
254	12	258	150	17	40	9	18.5	421307 1010	301,-
300	15	316	188	21	50	9	22.5	421307 1012	470,-
380	20	380	230	23	52	16	31	421307 1015	879,-

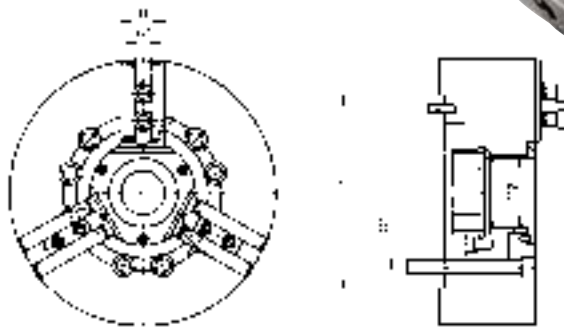
4114



## Kitagawa Wedge hook power chuck BR

NEW

- **Model BR / successor model to the BB-200 series**
- **Enlarged clearance**
- **Repetition precision of below 10 µm**  
Repetition precision of below 10 µm can be achieved when used with T-Nut-Plus slot nuts and Kitagawa SB jaws. Turned soft jaws for different clamping diameters can thus be exchanged with accuracy. This saves time and money!
- **Patented base jaw: up to 10% increased clamp force at maximum rotational speeds**
- Solid steel design
- Hardened and ground guides
- High true running accuracy
- Lubrication nipple in every base jaw
- Centre mount in accordance with DIN 6353
- Supplied without flange, **without top jaws**;  
supplied with 1.5 mm x 60° toothed base jaws, standard T-slot nuts, chuck and jaw fastening screws, unthreaded drawbar nuts and a special assembly key
- **Threaded drawbar nuts and BR 12 available on request**



### 3-jaw version

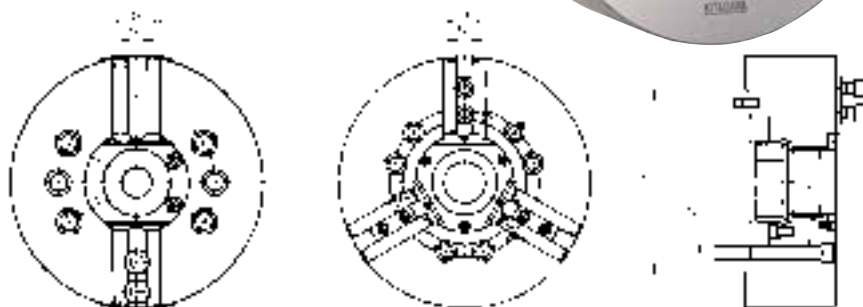
Model	Chuck Ø mm	L mm	B mm	B1 H7 mm	D H6 mm	D1 mm	D2 mm	Jaw lift distance mm	Piston stroke mm	max. clamp force kN	max. actuating force kN	max. speed t/min	Clamping range mm	Weight kg	U max.	art.no.	€
BR 06	170	81	31	12	140	104.8	53	5.5 in Ø	12	58.5	23	6000	16 - 170	12.8	M60 x 2	410102 1006	2.489,-
BR 08	210	91	35	14	170	133.4	66	7.4 in Ø	16	90	35	5000	22 - 210	22.2	M75 x 2	410102 1008	2.789,-
BR 10	254	100	40	16	220	171.4	81	8.8 in Ø	19	123	49	4500	31 - 254	35.8	M90 x 2	410102 1010	3.219,-

4114

# Kitagawa Wedge hook power chuck B/BT-200

DIN 6353

- Model B/BT-200
- Large through-hole
- All-steel design
- Hardened and ground guides
- High true-running accuracy
- Lubrication fitting in every base jaw
- Centre mount in accordance with DIN 6353
- Supplied without flange and **without top jaws**; includes 1.5 mm x 60° toothed base jaws, T-slot nuts, chuck and jaw fastening screws, unthreaded drawbar nuts, special assembly key
- Further sizes and models available on request
- **Threaded drawbar nuts available on request**



### 2-jaw version

Model	Chuck Ø mm	L mm	B mm	B1 H7 mm	D H6 mm	D1 mm	D2 mm	Jaw lift distance mm	Piston stroke mm	max. clamp force kN	max. actuating force kN	max. speed r/min	Clamping range mm	Weight kg	U max.	art.no.	€
BT-206	169	81	26	12	140	104.8	45	5.5	12	38	14.5	6000	14 - 169	11.5	M55 x 2	410110 0206	2.969,-
BT-208	210	91	35	14	170	133.4	52	7.4	16	57.3	23.2	5000	14 - 210	21.3	M60 x 2	410110 0208	2.829,-
BT-210	254	100	40	16	220	171.4	75	8.8	19	74	28.5	4200	31 - 254	33.5	M85 x 2	410110 0210	3.049,-
BT-212	304	110	50	21	220	171.4	91	10.6	23	96	36.7	3300	34 - 304	52	M100 x 2	410110 0212	3.999,-

### 3-jaw version

Model	Chuck Ø mm	L mm	B mm	B1 H7 mm	D H6 mm	D1 mm	D2 mm	Jaw lift distance mm	Piston stroke mm	max. clamp force kN	max. actuating force kN	max. speed r/min	Clamping range mm	Weight kg	U max.	art.no.	€
B-204	110	59	23	10	85	70.6	26	5.4	10	28.5	14	8000	7 - 110	4	M32 x 1.5	410101 0204	2.229,-
B-205	135	60	23	10	110	82.6	33	5.4	10	36	17.5	7000	12 - 135	6.7	M40 x 1.5	410101 0205	2.289,-
B-206	169	81	26	12	140	104.8	45	5.5	12	57	22	6000	16 - 168	11.9	M55 x 2	410101 0206	1.789,-
B-208	210	91	35	14	170	133.4	52	7.4	16	86	34.8	5000	13 - 210	22.3	M60 x 2	410101 0208	1.889,-
B-210	254	100	40	16	220	171.4	75	8.8	19	111	43	4200	31 - 254	34.5	M85 x 2	410101 0210	2.199,-
B-212	304	110	50	21	220	171.4	91	10.6	23	144	55	3300	34 - 304	55.3	M100 x 2	410101 0212	3.049,-

## Lubricant



### Grease gun

Contents	art.no.	€
200 ml	410199 0011	34,50
400 g	410199 0010	71,10

4114



### Chuck grease

Contents	art.no.	€
1 kg	410199 0012	90,60
400 g	410199 0013	38,30

4114

### Lubrication fitting

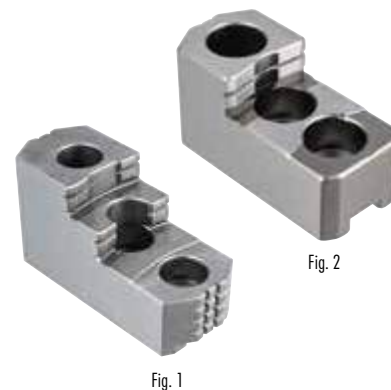
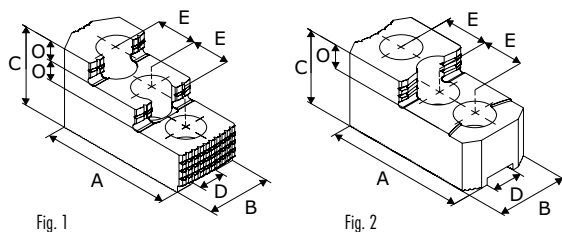
Designation	art.no.	€
For Kitagawa power chucks	410199 0002	5,60

4114



## ATORN® Reversible top jaws, 1.5 mm x 60°

- For chuck types: BT200 / B200 / BR
- hardened
- material 16 MnCr 5
- price per set of 3 units
- No reversible jaws available for BT204, BT205 and BT212
- other sizes can be found via the clamping jaw finder on our website



for chuck Ø mm	A mm	B mm	C mm	D mm	E mm	O mm	Screw	Weight kg	Illustration	art.no.	€
169	67	31	36	12	20	12	M10	1	2	420240 0006	253,50
210	87	35	51	14	25	12	M12	2.5	1	420240 0008	378,-
254	101	40	54	16	30	13	M12	3.5	1	420240 0010	419,-
304	103	50	52	21	30	17	M16	4.3	2	420240 0212	383,-

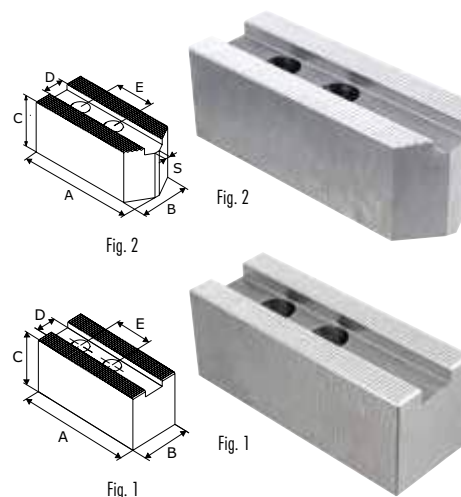
4166

## ATORN® Top jaws, 1.5 mm x 60°

- For chuck types: BT200 / B200 / BR
- material C15
- price per set of 3 units
- aluminium jaws and other sizes can be found via the clamping jaw finder on our website

for chuck Ø mm	A mm	B mm	C mm	D mm	E mm	Screw	Weight kg	Illustration	art.no.	€
110/135	52	22	24	10	14	M8	0.5	2	420210 0205	50,-
110/135	52	24	50	10	14	M8	1.1	2	420210 2055	47,-
169	72	30	31	12	20	M10	1.2	1	420210 0006	41,90
169	82	30	31	12	20	M10	1.2	2	420210 0601	55,50
169	72	30	50	12	20	M10	2	2	420210 0650	59,50
210	95	35	37	14	25	M12	2.2	2	420210 0008	49,20
210	95	35	37	14	25	M12	2.2	1	420210 0108	49,60
210	102	35	37	14	25	M12	2.9	2	420210 0801	58,-
210	95	35	79	14	25	M12	5	2	420210 0810	62,50
254	110	40	42	16	30	M12	3.5	2	420210 0010	52,50
254	125	40	42	16	30	M12	4.1	2	420210 1001	62,-
254	90	40	60	16	30	M12	4.2	1	420210 1010	67,-
254	110	40	60	16	30	M12	5.2	2	420210 1060	67,-
254	110	40	79	16	30	M12	8.1	1	420210 1080	79,-
304	129	50	50	21	30	M16	6	1	420210 0212	68,50
304	145	50	50	21	30	M16	6.7	2	420210 2121	93,-
304	129	50	79	21	30	M16	9.7	1	420210 2128	128,-

4166

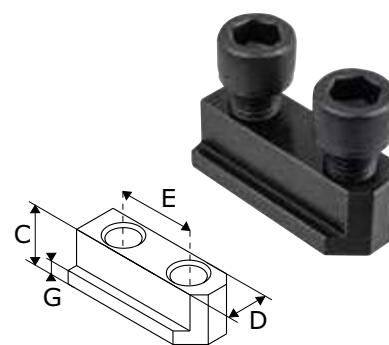


## ATORN® Slot nuts

- For chuck types: BT200 / B200 / BR
- Including cheese-head screws DIN 912-12.9
- Price per 3-piece set

for chuck Ø mm	C mm	D mm	E mm	G mm	Cyl. Screws DIN 912	art.no.	€
135	15	10	14	5.5	M8 x 20	420603 0005	82,50
169	18.5	12	20	7.5	M10 x 25	420603 0020	85,-
210	20.5	14	25	8.2	M12 x 30	420603 0030	91,50
254	21.5	16	30	8.5	M12 x 30	420603 0040	99,-
304	28	21	30	11.5	M16 x 35	420603 0050	125,-
381	45.5	24/22	43	16.5	M20 x 45	420603 0055	215,-

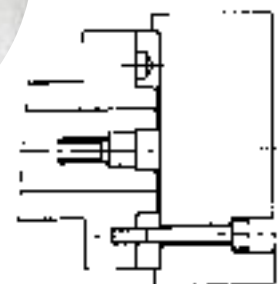
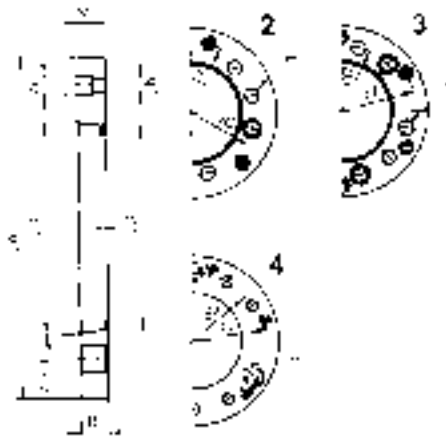
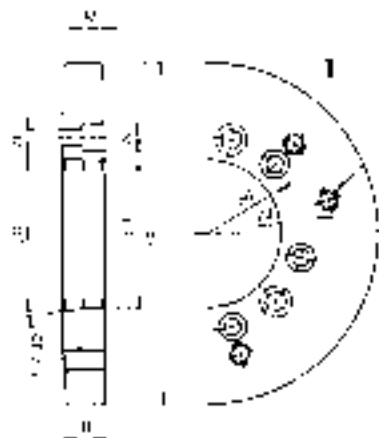
4166



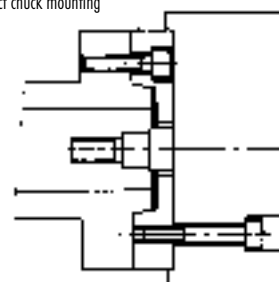


# Kitagawa Power chuck flange

- Precision flange featuring an all-steel design
- For chucks with centre mounts in accordance with DIN 6353
- Spindle-side design: Short taper in accordance with DIN 55026 and DIN 55021
- Compatible with: BT200 / B200 / BB200
- Supplied without flange fastening screws



Direct chuck mounting  
Indirect chuck mounting

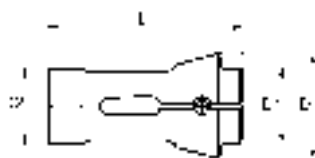


A mm	B mm	C mm	D mm	G mm	H mm	J mm	K mm	L mm	M mm	N mm	Illustration	Chuck Ø mm	Size spindle nose	For 2-jaw chucks art.no.	€	For 3-jaw chucks art.no.	€	
140	15	82.563	79.7	104.78	12	116	-	11	7	6.6	2	169	A2-5	413010 1005	249,-	413001 1005	259,-	
140	41	106.375	103	133.35	13.5	104.78	M10	20	24	-	1	169	A2-6	413010 1006	253,-	413001 1006	259,-	
170	22	82.563	79.7	104.78	11	133.35	M12	17	11	-	1	210	A2-5	413010 2005	318,-	413001 2005	318,-	
170	17	106.375	103	133.35	13.5	150	-	11	7	6.6	3	210	A2-6	413010 2006	318,-	413001 2006	318,-	
220	25	106.375	103	133.35	13.5	171.45	M16	20	13.5	-	1	254/304	A2-6	413010 3006	435,-	413001 3006	435,-	
220	18	139.719	136	171.45	17	190	-	14	10	9	4	254/304	A2-8	413010 3008	420,-	413001 3008	435,-	
300	33	139.719	140	171.45	17	235	M20	25	17	-	1	381	A2-8	413010 4008	609,-	413001 4008	609,-	
300	22	196.869	192.1	235	21	260	-	17	11	11	4	381	A2-11	413010 4011	609,-	413001 4011	609,-	
															4114		4114	

## FAHRION® Dead-length collets

DIN 6343

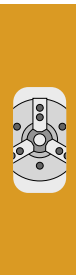
- Hardened and ground
- True running accuracy:
  - Ø 1-10 mm ≤ 20 µm
  - Ø 11-30 mm ≤ 30 µm
  - Ø 31-60 mm ≤ 40 µm
- Collapse maximum 0.1 mm of nominal diameter
- Smooth bore up to Ø 8 mm, transverse grooves from Ø 9 mm
- Square/hex.: up to 12 mm = smooth bore, from 13 mm = with transverse grooves
- Collets with longitudinal and transverse grooving available on request, as well as multi-range collets in a variety of designs



Clamp Ø mm	173E round	173E square	173E hexagonal	185E round	185E square	185E hexagonal
	D=60 mm D1=50 mm D2=48 mm L=94 mm art.no. €	D=60 mm D1=50 mm D2=48 mm L=94 mm art.no. €	D=60 mm D1=50 mm D2=48 mm L=94 mm art.no. €	D=84 mm D1=73 mm D2=66 mm L=110 mm art.no. €	D=84 mm D1=73 mm D2=66 mm L=110 mm art.no. €	D=84 mm D1=73 mm D2=66 mm L=110 mm art.no. €
1	433035 0010 112,-					
1.5	433035 0015 74,80					
2	433035 0020 74,80					
2.5	433035 0025 74,80					
3	433035 0030 56,-					
3.5	433035 0035 56,-					
4	433035 0040 56,-			433041 0040 119,-		
4.5	433035 0045 56,-					
	4119	4119	4119	4119	4119	4119

Continued on next page >>>

Clamp Ø mm	173E round D=60 mm D1=50 mm D2=48 mm L=94 mm		173E square D=60 mm D1=50 mm D2=48 mm L=94 mm		173E hexagonal D=60 mm D1=50 mm D2=48 mm L=94 mm		185E round D=84 mm D1=73 mm D2=66 mm L=110 mm		185E square D=84 mm D1=73 mm D2=66 mm L=110 mm		185E hexagonal D=84 mm D1=73 mm D2=66 mm L=110 mm	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
5	433035 0050	56,-					433041 0050	119,-				
5.5	433035 0055	56,-										
6	433035 0060	56,-	<b>433037</b> 0060	98,70	<b>433039</b> 0060	98,70	433041 0060	119,-				
6.5	433035 0065	56,-										
7	433035 0070	56,-	433037 0070	81,40	433039 0070	81,40	433041 0070	119,-	<b>433043</b> 0070	144,50		
7.5	433035 0075	56,-										
8	433035 0080	56,-	433037 0080	81,40	433039 0080	81,40	433041 0080	119,-	433043 0080	144,50	<b>433045</b> 0080	144,50
9	433035 0090	56,-	433037 0090	81,40	433039 0090	81,40	433041 0090	119,-	433043 0090	144,50	433045 0090	144,50
10	433035 0100	56,-	433037 0100	81,40	433039 0100	81,40	433041 0100	119,-	433043 0100	144,50	433045 0100	144,50
11	433035 0110	56,-	433037 0110	81,40	433039 0110	81,40	433041 0110	119,-	433043 0110	144,50	433045 0110	144,50
12	433035 0120	56,-	433037 0120	81,40	433039 0120	81,40	433041 0120	119,-	433043 0120	144,50	433045 0120	144,50
13	433035 0130	56,-	433037 0130	81,40	433039 0130	81,40	433041 0130	119,-	433043 0130	144,50	433045 0130	144,50
14	433035 0140	56,-	433037 0140	81,40	433039 0140	81,40	433041 0140	119,-	433043 0140	144,50	433045 0140	144,50
15	433035 0150	56,-			433039 0150	81,40	433041 0150	119,-			433045 0150	144,50
16	433035 0160	56,-	433037 0160	81,40	433039 0160	81,40	433041 0160	119,-	433043 0160	144,50	433045 0160	144,50
17	433035 0170	56,-			433039 0170	81,40	433041 0170	119,-			433045 0170	144,50
18	433035 0180	56,-	433037 0180	81,40			433041 0180	119,-	433043 0180	144,50		
19	433035 0190	56,-			433039 0190	81,40	433041 0190	119,-			433045 0190	144,50
20	433035 0200	56,-	433037 0200	104,-			433041 0200	119,-	433043 0200	167,-		
21	433035 0210	56,-					433041 0210	119,-				
22	433035 0220	56,-	433037 0220	104,-	433039 0220	81,40	433041 0220	119,-	433043 0220	167,-	433045 0220	144,50
23	433035 0230	56,-					433041 0230	119,-				
24	433035 0240	56,-			433039 0240	81,40	433041 0240	119,-			433045 0240	144,50
25	433035 0250	56,-	433037 0250	104,-			433041 0250	119,-	433043 0250	167,-		
26	433035 0260	56,-					433041 0260	119,-				
27	433035 0270	56,-			433039 0270	81,40	433041 0270	119,-			433045 0270	144,50
28	433035 0280	56,-	433037 0280	104,-			433041 0280	119,-	433043 0280	167,-		
29	433035 0290	56,-					433041 0290	119,-				
30	433035 0300	56,-			433039 0300	104,-	433041 0300	119,-	433043 0300	193,50	433045 0300	167,-
31	433035 0310	56,-					433041 0310	119,-				
32	433035 0320	56,-			433039 0320	104,-	433041 0320	119,-	433043 0320	193,50	433045 0320	167,-
33	433035 0330	56,-					433041 0330	119,-				
34	433035 0340	56,-					433041 0340	119,-				
35	433035 0350	56,-					433041 0350	119,-				
36	433035 0360	56,-			433039 0360	104,-	433041 0360	119,-	433043 0360	193,50	433045 0360	167,-
37	433035 0370	56,-					433041 0370	119,-				
38	433035 0380	56,-					433041 0380	119,-			433045 0380	193,50
39	433035 0390	56,-					433041 0390	119,-				
40	433035 0400	56,-					433041 0400	119,-	433043 0400	193,50		
41	433035 0410	56,-					433041 0410	119,-			433045 0410	193,50
42	433035 0420	56,-					433041 0420	119,-				
43							433041 0430	119,-				
44							433041 0440	119,-				
45							433041 0450	119,-				
46							433041 0460	119,-			433045 0460	203,-
47							433041 0470	119,-				
48							433041 0480	119,-				
49							433041 0490	119,-				
50							433041 0500	119,-			433045 0500	203,-
51							433041 0510	119,-				
52							433041 0520	119,-				
53							433041 0530	119,-				
54							433041 0540	119,-				
55							433041 0550	119,-				
56							433041 0560	119,-				
57							433041 0570	119,-				
58							433041 0580	119,-				
59							433041 0590	119,-				
60							433041 0600	119,-				
	4119		4119		4119		4119		4119		4119	



**FAHRION®** Emergency dead-length collets

**DIN  
6343**

- For internal turning
- Hardened and tempered to approx. 45 HRC and fully ground
- Can be clamped in chucks using three removable alignment pins at the front, and can be machine-finished to the required bore diameter or with a stepped hole

Designation	D mm	D1 mm	D2 mm	L mm	Ø mm	art.no.	€
173 E	60	50	48	94	Pre-drilled to Ø 3	<b>433047</b> 0030	<b>69,70</b>
185 E	84	73	66	110	Pre-drilled to Ø 4	433049 0040	<b>143,50</b>

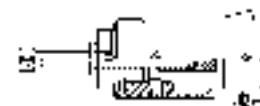
4119


**SARA®** Internal stop for dead-length collets

- For dead length collets in accordance with DIN 6343
- No collet shank deformation or impact on clamping behaviour
- Can also be used as a limit stop for hollow parts
- Can be used with round, hexagonal and square collets

for collets		art.no.	€
173 E		<b>433052</b> 0173	<b>146,50</b>
185 E		433052 0185	<b>161,-</b>

4120


**Kitagawa** CRL power-operated collet chuck

- All-steel design, hardened and precision-ground
- For multi-range and steel collets in accordance with DIN 6343, 173 E or 185 E
- 2 sizes: up to material Ø 42 mm, or up to material Ø 60 mm
- Other sizes for a maximum material Ø 36 mm, 54 mm and 66 mm are available on request
- Equipped for use with a length stop, but only in combination with multi-range collets.
- For bar work on CNC lathes
- Especially for high speeds and true-running accuracies
- Supplied with chuck fastening screws and thrust collar (unthreaded)
- Without collets
- **Threaded drawbar nuts available on request**


**CRL-42 for 173E dead-length collets**

Model	Holding fixtures	A mm	B mm	U max.	max. actuating force kN	max. clamp force kN	max. speed r/min	Weight kg	Straight holding fixture art.no. €	Short taper art.no. €
CRL-42	Straight	110	133	M55 x 1.5	25	55	7100	8.8	<b>415001</b> 0001 <b>869,-</b>	
CRL-42/5	Short taper size 5	110	143	M55 x 1.5	25	55	7100	8.4		<b>415010</b> 0005 <b>919,-</b>
CRL-42/6	Short taper size 6	110	145	M55 x 1.5	25	55	7100	10		415010 0006 <b>919,-</b>

4114

4114

**CRL-60 for 185E dead-length collets**

Model	Holding fixtures	A mm	B mm	U max.	max. actuating force kN	max. clamp force kN	max. speed r/min	Weight kg	Straight holding fixture art.no. €	Short taper art.no. €
CRL-60	Straight	138	148	M70 x 1.5	30	60	6300	14.2	<b>415020</b> 0001 <b>1.249,-</b>	
CRL-60/6	Short taper size 6	138	160	M70 x 1.5	30	60	6300	14.2		<b>415030</b> 0006 <b>1.249,-</b>
CRL-60/8	Short taper size 8	138	156	M70 x 1.5	30	60	6300	17.7		415030 0008 <b>1.249,-</b>

4114

4114

## Kitagawa QCRL / QD-CRL power-operated collet chuck

- **Model QD-CRL comes without a flange - direct short taper holding fixture included**
- **Bayonet fixing allows collets to be changed quickly**
- For  $\varnothing$  42 mm (173E) up to  $\varnothing$  60 mm (185E), version up to  $\varnothing$  80 mm (193E) and collet reducer from 185E to 173E available on request
- For bar work on CNC lathes, especially for high speeds and true-running accuracies
- Supplied with chuck fastening screws and thrust collar (unthreaded), without collets
- **Threaded drawbar nuts available on request**



### QCRL-42 for 173E dead-length collets

Model	Holding fixtures	A mm	B mm	U max.	max. actuating force kN	max. clamp force kN	max. speed r/min	Weight kg	Straight holding fixture art.no.	€	Short taper art.no.	€
QCRL-42	Straight $\varnothing$ 140	113	149	M58 x 1.5	25	55	7100	13.5	415101 0001	999,-		
QD-CRL-42/5	Short taper 5	113	143	M58 x 1.5	25	55	7100	13.5			415110 1005	989,-
QCRL-42/6	Short taper 6	113	143	M58 x 1.5	25	55	7100	13.5			415110 0006	1.079,-
									4114		4114	

### QCRL-60 for 185E dead-length collets

Model	Holding fixtures	A mm	B mm	U max.	max. actuating force kN	max. clamp force kN	max. speed r/min	Weight kg	Straight holding fixture art.no.	€	Short taper art.no.	€
QCRL-60	Straight $\varnothing$ 170	143	177	M75 x 1.5	30	60	6300	29	415120 0001	1.259,-		
QD-CRL-60/6	Short taper 6	143	171	M75 x 1.5	30	60	6300	29			415130 1006	1.309,-
QCRL-60/8	Short taper 8	143	171	M75 x 1.5	30	60	6300	29			415130 0008	1.429,-
									4114		4114	

## Kitagawa DHP power-operated collet chuck

- **Model DHP65**
- Compact design
- High accuracy
- Ideal for use in initial machining due to axial tension
- Fully compatible with commercially available 65 mm clamping heads
- Easily adaptable to existing machinery
- DHP65 chucks are lightweight and can be fitted quickly
- Supplied without collets or changing fixtures; includes blank unthreaded drawbar nut
- Additional chucks available on request
- **Threaded drawbar nuts available on request**



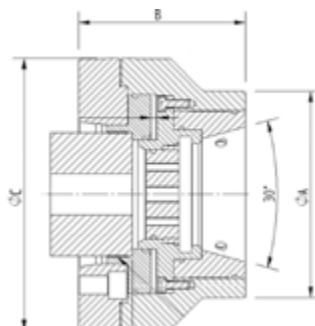
### Clamping $\varnothing$ max. 65 mm

Model	Holding fixtures	A mm	B mm	C mm	U max.	art.no.	€
DHP-65/5	Short taper 5	130	95	165	M70 x 2	415201 0005	999,-
DHP-65/6	Short taper 6	130	95	165	M85 x 2	415201 0006	999,-
DHP-65/8	Short taper 8	130	95	210	M85 x 2	415201 0008	1.129,-

4114

# Kitagawa Power-operated collet chuck DKF

- **Model DKF65: clamp Ø max. 65 mm**
- Compact design
- High precision
- **Clamping without changing the axial position of the clamping head**
- Ideal for bar stock, secondary machining or inserts on a main or counter spindle
- Fully compatible with commercially available 65 mm clamping heads
- Easily adaptable to existing machinery
- Supplied without collets and switching equipment, includes blank unthreaded drawbar nut
- Threaded drawbar nuts available on request



## DKF 65

- For clamping head size 65

Model	Holding fixtures	A mm	B mm	C mm	U max.	art.no.	€
DKF65/Z140	Ø140	123	137.5	167	M75 x 2	<b>415204 6514</b>	<b>1.899,-</b>
DKF65/A5	Short taper 5	123	137.5	167	M74 x 2	415204 6505	<b>1.829,-</b>
DKF65/A6	Short taper 6	123	137.5	167	M75 x 2	415204 6506	<b>1.869,-</b>
DKF65/A8	Short taper 8	123	161.5	201.5	M75 x 2	415204 6508	<b>1.909,-</b>

4114

## SARA® Clamping heads SK

- For all common axial clamping systems on lathes and vices
- Tried and tested, exceptionally stable rubber-metallic compound
- High retention forces
- **Version with transverse grooves and for multi-spindle lathes available on request**

### Clamping heads with smooth bore

Please indicate clamping head Ø in mm as three-digit figure

- Order example SK42 Ø 8.5 = 433060 1 **085**
- Order example SK65 Ø 39.0 = 433060 4 **390**

Clamp Ø mm	433060.... SK 42 €	433060.... SK 65 €
4 - 5.5	144,50	
6 - 42	144,50	184,50
42.5 - 65		184,50
	4196	4196



### Clamping heads with longitudinal and transverse grooves

Please indicate clamping head Ø in mm as three-digit figure

- Order example SK42 Ø 11.5 = 433060 3 **115**
- Order example SK65 Ø 48.0 = 433060 6 **480**

Clamp Ø mm	433060.... SK 42 €	433060.... SK 65 €
10	144,50	
11 - 42	144,50	184,50
43 - 65		184,50
	4196	4196



### Manual changing fixture

Model	art.no.	€
MW 42	<b>433061 0042</b>	<b>390,-</b>
MW 65	433061 0065	<b>399,-</b>

4196

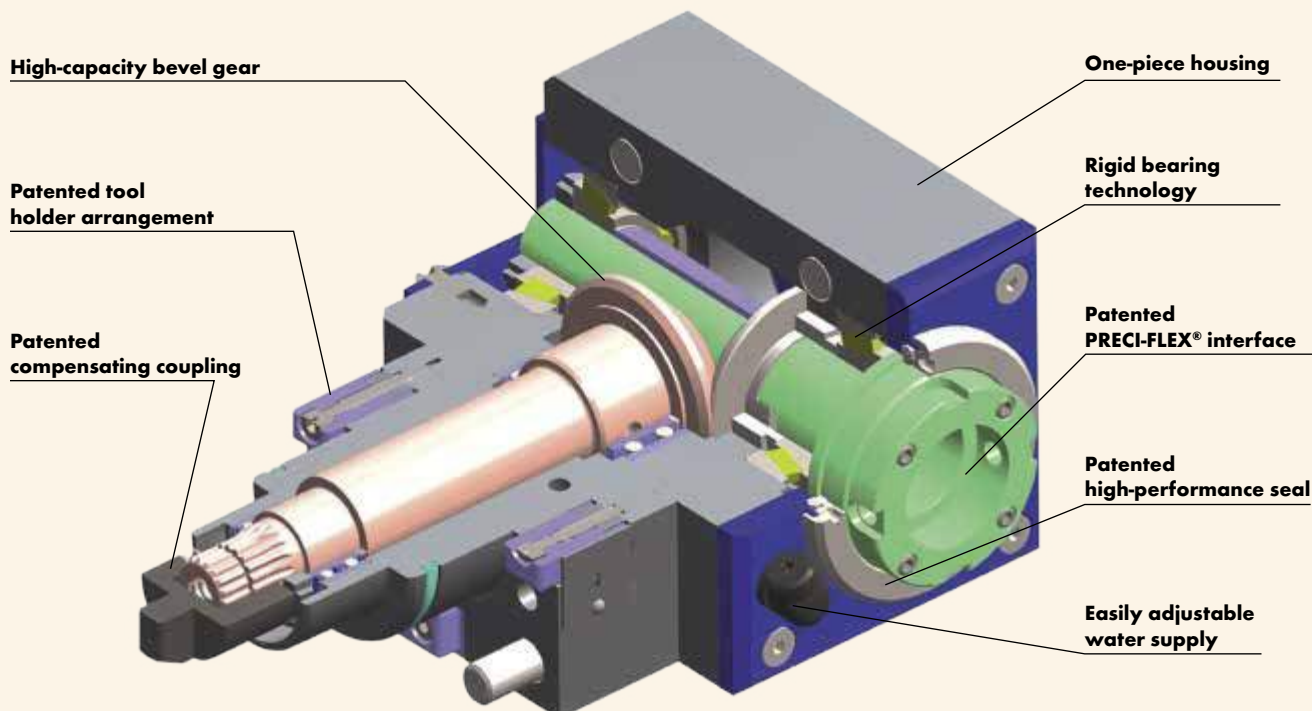




**for CNC lathes**

- Tools for complete production on CNC lathes
  - Drilling, milling and thread cutting in one clamping operation
  - Tools for axial or radial machining with the widest range of tool holders
  - German production with in-house repair service
- **Use** with all common CNC lathes that are suitable for powered tools
- No conversion from turning to milling
  - The widest variety of tools
  - Lower fixture costs since second clamping is not required
  - Compliance with the tightest shape and position tolerances as the workpiece is produced in a single clamping

**Individual, no-obligation quotes for powered tools are available on request.**

**Revolver / tool concept**

**A very rigid and accurate system. Three important unmatched innovations for increased efficiency and productivity.**

**4 default slot nuts**

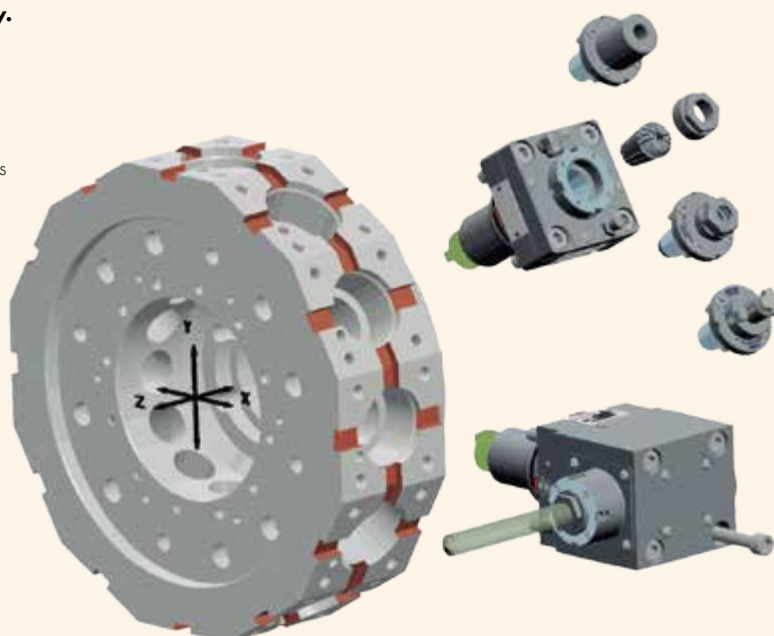
- Simple conversion, no adjustment required
- Up to 300% greater repeatability compared with other systems
- Repeatability of the position  $<0.005$  mm
- Alignment with the machine spindle  $<0.1$  mm

**Compensating coupling**

- Floating drive, minimal clearance
  - Vibration and noise reduction
  - Simple maintenance, long service life
  - Improved torque transfer
- Contact surface enhanced by 60%

**Rigid and flexible tool interface**

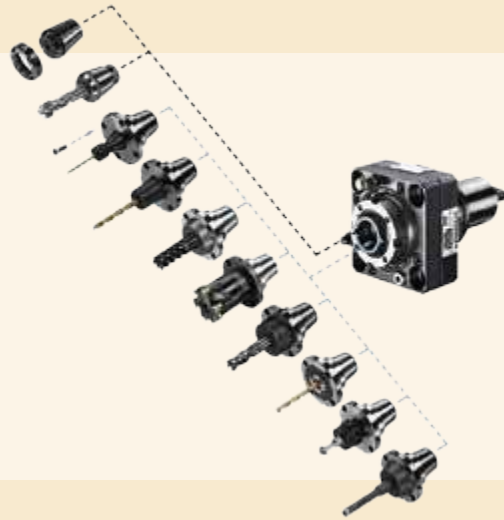
- Use of standard collets and adapters
- Maximum accuracy
- Optimum rigidity and flexibility for heavy machining
- Greater machine output and lower production costs



## EPPINGER PRECI-FLEX®

SMARTER TOOLING SOLUTIONS

- The ESA Eppinger modular system creates completely new possibilities in precision, flexibility and efficiency.
- Interface based on standard collet mounts
- The benefits speak for themselves
- ER collet mount and PRECI-FLEX adapter in one tool holder
- maximum expansion capability
- taper/planar support, absolute precision
- very compact
- maximum rigidity, thus outstanding cutting performance
- long tool lives
- pre-settable
- quickly re-settable
- optimum efficiency

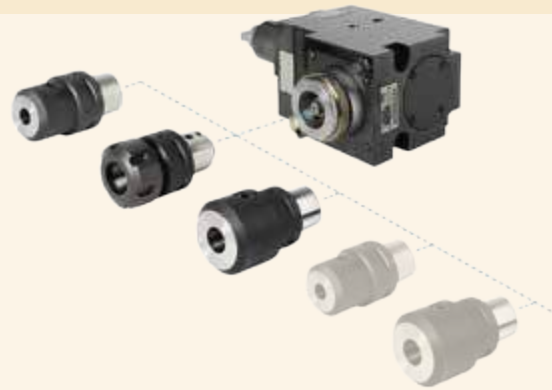


INFO

## EPPINGER PSC

SMARTER TOOLING SOLUTIONS

- world's shortest PSC interface
- lots of space – even for large workpieces
- compact design increases system rigidity and thus workpiece accuracy
- comfortable one-hand operation, fast tool changes
- available on request

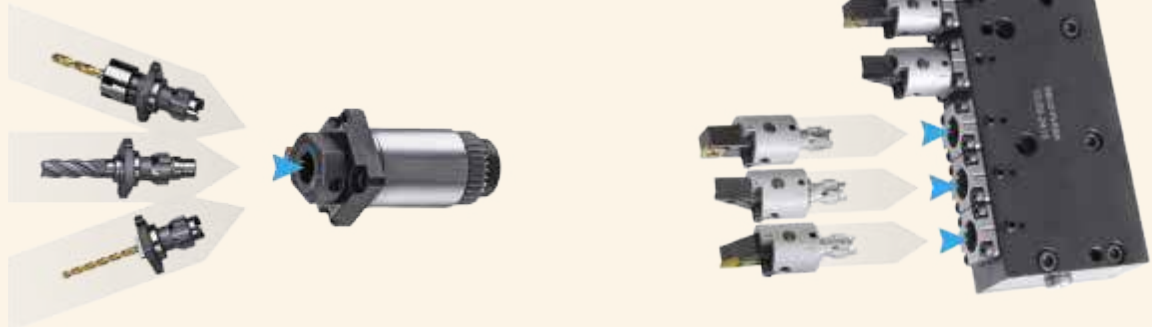


INFO

## EPPINGER DECOFLEX®

SMARTER TOOLING SOLUTIONS

- Tool holders with minimal dimensions
- particularly suited for use in small-scale lathe-milling machines
- available on request



INFO





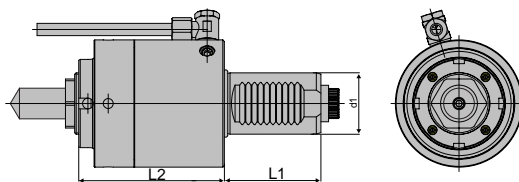
**EPPINGER PRECI-FLEX® powered tool holder with VDI shank**

**• for CNC lathes with Sauter revolver and drive coupling DIN 5480**

- Each tool holder must be run-in. Thus temperature and noise emissions are monitored, measured and recorded.
- compact design of the single-piece base body
- very rigid bearing above taper roller bearing
- optimal position of the spindle
- patented seals to minimise heat generation
- internal cooling up to max. 70 bar
- all wear parts hardened and ground

**Boring/milling head, straight collet mount**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling



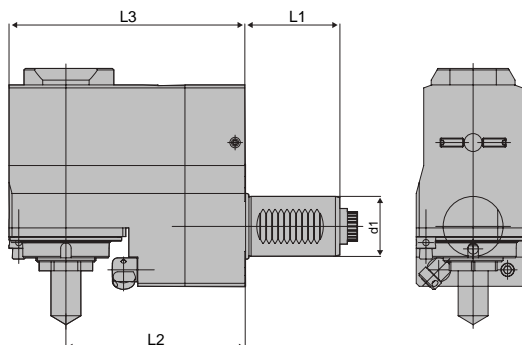
Shank	for collets	Type	L1 mm	L2 mm	d1 mm	d2 mm	art.no.	€
VDI 30	ER25	1	67	79	30	1 - 16	<b>430510 3025</b>	<b>909,-</b>
VDI 30	ER25	2	67	79	30	1 - 16	430510 3125	1.079,-
VDI 40	ER32	1	74.8	95	40	2 - 20	430510 4032	979,-
VDI 40	ER32	2	74.8	95	40	2 - 20	430510 4132	1.129,-

4185



**Angled boring/milling head, offset**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling



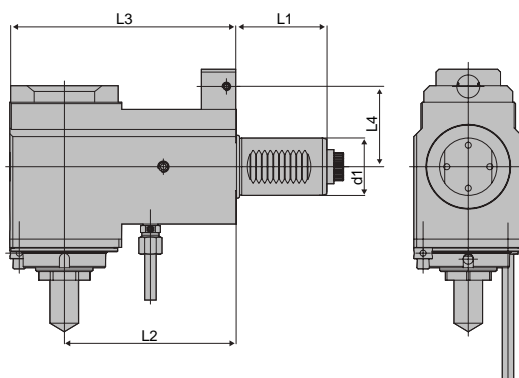
Shank	for collets	Type	L1 mm	L2 mm	L3 mm	d1 mm	art.no.	€
VDI 30	ER25	1	67	85	117.5	30	<b>430511 3025</b>	<b>2.129,-</b>
VDI 30	ER25	2	67	85	117.5	30	430511 3125	2.319,-
VDI 40	ER32	1	74.8	85	158	40	430511 4032	2.479,-
VDI 40	ER32	2	74.8	85	158	40	430511 4132	2.739,-

4185



**Angled boring/milling head**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling



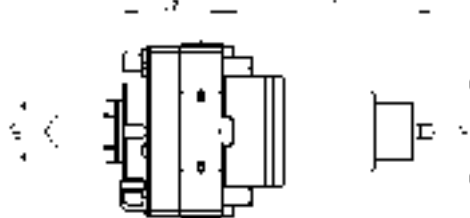
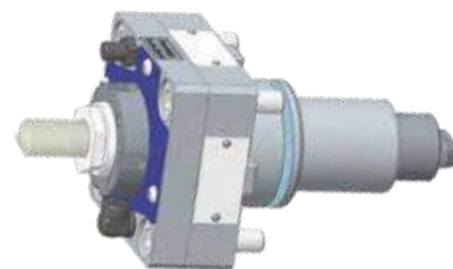
Shank	for collets	Type	L1 mm	L2 mm	L3 mm	L4 mm	d1 mm	art.no.	€
VDI 30	ER25	1	67	100	132.5	48	30	<b>430512 3025</b>	<b>1.949,-</b>
VDI 30	ER25	2	67	100	132.5	48	30	430512 3125	2.139,-
VDI 40	ER32	1	74.8	120	158	56	40	430512 4032	2.219,-
VDI 40	ER32	2	74.8	120	158	56	40	430512 4132	2.399,-

4185



**• for CNC lathes with BMT interface**

- Each tool holder must be run-in. Thus temperature and noise emissions are monitored, measured and recorded.
- compact design of the single-piece base body
- very rigid bearing above taper roller bearing
- optimal position of the spindle
- patented seals to minimise heat generation
- internal cooling up to max. 70 bar
- all wear parts hardened and ground


**BMT 40, for DMG MORI**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
84	44	45	1 - 13	ER20	1	<b>430532 0040</b>	<b>989,-</b>
84	44	45	1 - 13	ER20	2	430532 1040	1.289,-

4185

**BMT 45, for Doosan, Hardinge, SMEC**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
84	44	45	1 - 13	ER20	1	<b>430501 0045</b>	<b>859,-</b>
84	44	45	1 - 13	ER20	2	430501 1045	1.279,-

4185

**BMT 55, for Doosan, Hardinge, SMEC, Hwacheon, Hyundai WIA, Victor**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
104	49	55	1 - 16	ER25	1	<b>430502 0055</b>	<b>919,-</b>
104	49	55	1 - 16	ER25	2	430502 1055	1.329,-

4185

**BMT 55, for Nakamura, CMZ**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
106.5	47	55	1 - 16	ER25	2	<b>430536 0055</b>	<b>1.029,-</b>
106.5	47	55	1 - 16	ER25	1	430536 1055	829,-

4185

**BMT 60, for DMG MORI**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
91	83.5	60	3 - 26	ER40	1	<b>430533 0060</b>	<b>1.259,-</b>
91	83.5	60	3 - 26	ER40	2	430533 1060	1.499,-

4185

**BMT 60, for Okuma LB 2000/2500/3000/LU 3000EX M/MY**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
62	65	60	2 - 20	ER32	1	<b>430534 0060</b>	<b>1.549,-</b>
62	65	60	2 - 20	ER32	2	430534 1060	1.799,-

4185

Continued on next page &gt;&gt;&gt;

**BMT 65, for Doosan, SMEC, Hwacheon, Hyundai WIA, Victor**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
112	58	65	2 - 20	ER25	1	<b>430503 0065</b>	<b>1.099,-</b>
112	58	65	2 - 20	ER25	2	430503 1065	1.469,-

4185

**BMT 68, for Mazak**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
90	55.5	68	2 - 20	ER32	1	<b>430535 1068</b>	<b>1.039,-</b>
90	55.5	68	2 - 20	ER32	2	430535 0068	1.329,-

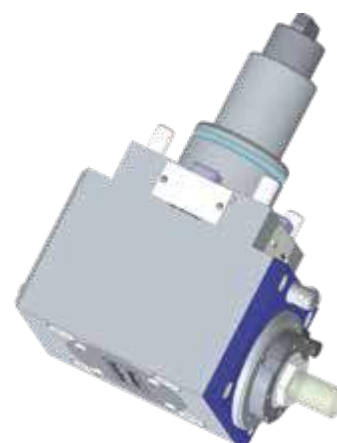
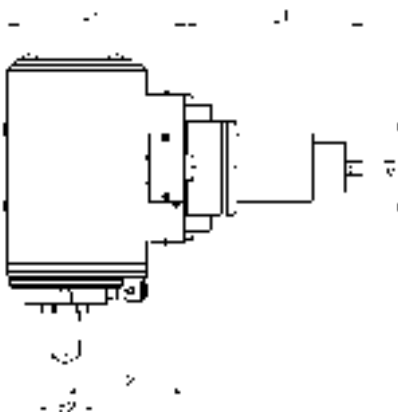
4185


**EPPINGER PRECI-FLEX® powered tool holder BMT, radial**

NEW

**• for CNC lathes with BMT interface**

- Each tool holder must be run-in. Thus temperature and noise emissions are monitored, measured and recorded.
- compact design of the single-piece base body
- very rigid bearing above taper roller bearing
- optimal position of the spindle
- patented seals to minimise heat generation
- internal cooling up to max. 70 bar
- all wear parts hardened and ground

**BMT 40, for DMG MORI**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	L3 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
69	85	124	40	1 - 16	ER25	1	<b>430537 0040</b>	<b>1.709,-</b>
69	85	124	40	1 - 16	ER25	2	430537 1040	2.099,-

4185

**BMT 45, for Doosan, Hardinge, SMEC**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	L3 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
84	65	93.5	45	1 - 13	ER20	1	<b>430504 0045</b>	<b>1.919,-</b>
84	65	93.5	45	1 - 13	ER20	2	430504 1045	2.519,-

4185

**BMT 55, for Nakamura, CMZ**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	L3 mm	d2 mm	for collets	Type	art.no.	€
106.5	55	94	1 - 16	ER25	1	<b>430541 1055</b>	<b>1.649,-</b>
106.5	55	94	1 - 16	ER25	2	430541 0055	1.779,-

4185

**BMT 60, for DMG MORI**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	L3 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
91	90	130	40	3 - 26	ER40	1	<b>430538 1060</b>	<b>1.939,-</b>
91	90	130	40	3 - 26	ER40	2	430538 0060	2.149,-

4185

**BMT 55, for Doosan, Hardinge, SMEC, Hwacheon, Hyundai WIA, Victor**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	L3 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
104	70	104	55	1 - 16	ER25	1	<b>430505</b> 0055	2.069,-
104	70	104	55	1 - 16	ER25	2	430505 1055	2.649,-
104	85	119	55	1 - 16	ER25	1	430505 2055	2.539,-
104	85	119	55	1 - 16	ER25	2	430505 3055	2.829,-

4185

**BMT 60, for Okuma LB 2000/2500/3000/LU 3000EX M/MY**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	L3 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
62	70	108	60	2 - 20	ER32	1	<b>430539</b> 1060	2.389,-
62	70	108	60	2 - 20	ER32	2	430539 0060	2.729,-

4185

**BMT 65, for Doosan, SMEC, Hwacheon, Hyundai WIA, Victor**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	L3 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
112	72	110	65	2 - 20	ER32	1	<b>430506</b> 0065	2.369,-
112	72	110	65	2 - 20	ER32	2	430506 1065	2.829,-
112	110	138	65	2 - 20	ER32	1	430506 2065	2.399,-
112	110	138	65	2 - 20	ER32	2	430506 3065	2.859,-

4185

**BMT 68, for Mazak**

- ER collet mount
- Type 1 external cooling
- Type 2 external and internal cooling

L1 mm	L2 mm	L3 mm	d1 mm	d2 mm	for collets	Type	art.no.	€
90	80	117	68	2 - 20	ER32	1	<b>430540</b> 1068	1.969,-
90	80	117	68	2 - 20	ER32	2	430540 0068	2.169,-

4185

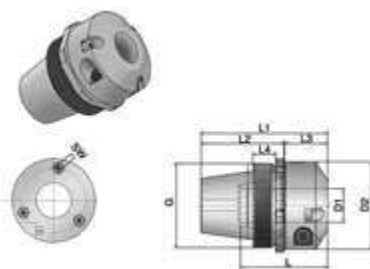
**SARA® Hydraulic expansion clamping unit ECOGRIP ER**

- renders ER collet systems hydraulic
- Adjustable radial run-out
- installed correctly, a true running accuracy of 0.003mm is achieved. The radial run-out can be further adjusted to the desired accuracy by slightly tightening the setting screws.

powered by ETP



Application video ECOGRIP-ER

**for powered tools with ER female thread**

Designation	D1 mm	D2 mm	L mm	L1 mm	L2 mm	L3 mm	L4 mm	Thread	Wt. width mm	art.no.	€
ER20	12	16	40	60.5	36	24	10	M32 x 1.5	3	<b>433814</b> 2512	288,-
ER25	12	16	46	71	44.5	26	12	M40 x 1.5	3	433814 3212	288,-
ER25	16	16	46	71	44.5	26	12	M40 x 1.5	3	433814 3216	288,-
ER32	20	22	52	75.5	49.5	25.5	13.5	M50 x 1.5	3	433814 4020	327,-

4130



## High-speed spindles Toodle Blue and Toodle Green

- **Toodle Blue, driven with coolant**
- **Toodle Green, driven with minimal lubrication**
- Turbine-driven high-speed spindle
- Rotational speeds of up to 75,000 rpm
- Consistent and high true running accuracy thanks to interchangeable bearings and turbine
- Can also be used with upright machine spindle
- Most demanding machine applications with a standard tool holder
- Affordable transformation of existing machine centres with standard spindles into high-speed and ultra-modern machining centres
- **Compatible with any sealed chuck with internal coolant supply**  
Example: SARA collet chucks ER40 Art. No. 4310034026 with sealed collet ER40 - Ø25 Art. No. 4331354025
- **NOT compatible with milling cutter holder DIN 6359 (Weldon holders), cutting edge diameter must be smaller than shank diameter**



### Toodle Blue high-speed spindle

- **Coolant pressure at the spindle: 10-60 bar**
- Coolant-driven
- Supplied without bearings and turbine

Ø mm	L mm	art.no.	€
25	40	<b>430000 0025</b>	<b>455,-</b>

4195



### Toodle Blue high-speed spindle 90°

- **Coolant pressure at the spindle: 10-60 bar**
- Coolant-driven
- Supplied without bearings and turbine

Holding fixture Ø mm	art.no.	€
16 mm	<b>430001 0090</b>	<b>749,-</b>

4195



### Toodle Green high-speed spindle

- **Air pressure at the spindle: 3-5 bar**
- Driven by minimum volume lubrication
- Supplied without bearings and turbine

Ø mm	L mm	art.no.	€
25	40	<b>430002 0001</b>	<b>455,-</b>

4195



### Mounting device

for shank Ø mm	art.no.	€
3	<b>430200 0003</b>	<b>89,50</b>
4	430200 0004	<b>89,50</b>
6	430200 0006	<b>89,50</b>

4195



### Installation set consisting of

- 2 ball bearings
- 1 turbine

for shank Ø mm	art.no.	€
3	<b>430100 0003</b>	<b>32,60</b>
4	430100 0004	<b>32,60</b>
6	430100 0006	<b>32,60</b>

4195



**Press-fit measuring adapter**

• Without manometer

for tool holder		art.no.	€
Ø 25mm		<b>430300 0025</b>	<b>49,90</b>
4195			

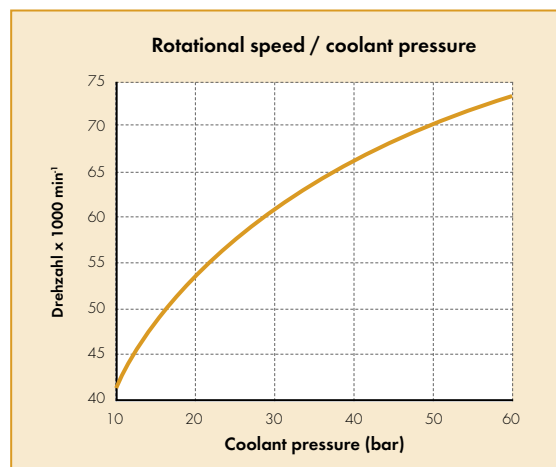
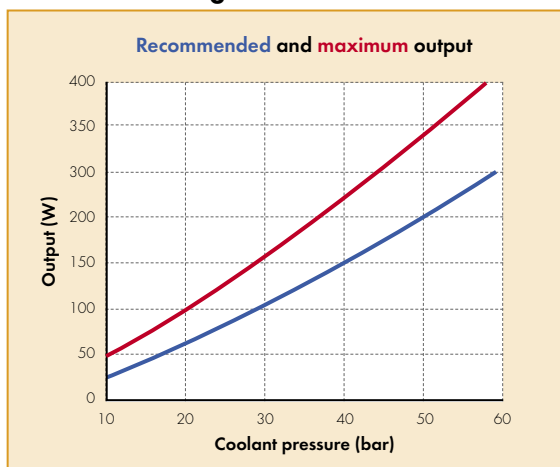


**Manometer for press-fit measuring adapter**

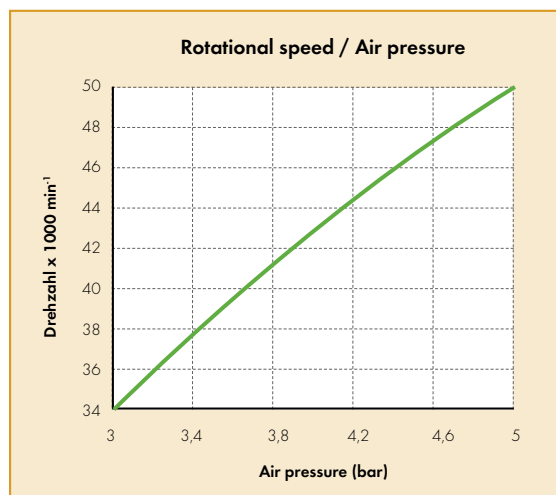
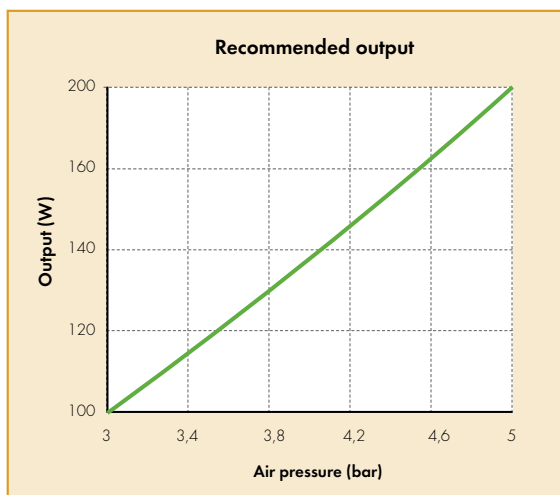
Ø mm	Connection thread	art.no.	€
63	1/4"	<b>442150 9905</b>	<b>50,80</b>
4195			



**Performance diagram Toodle Blue**



**Performance diagram Toodle Green**



# Toodle-Blue-Configurator

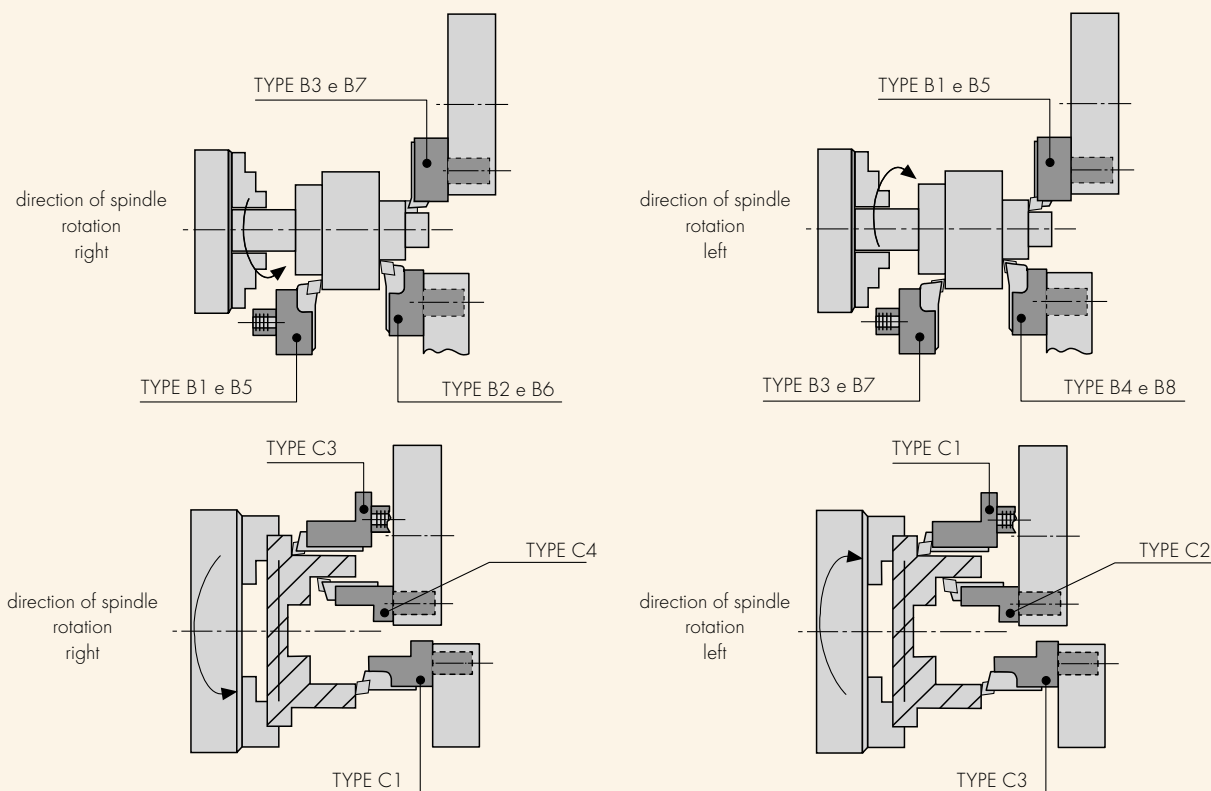


The Toodle-Blue-Configurator for determining the operating values is available in the service section of our website: [saratools.com](http://saratools.com)

# Overview and possible uses of DIN 69880-compliant VDI tool holder

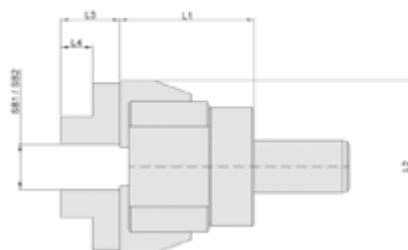
**INFO**

with straight shank  
and internal coolant supply for NC lathes



## Bar gripper

- Indexable jaws for several clamping ranges
- Wide clamping range
- Quick and easy setting
- Large range of clamping shanks



### DIN 69880 (VDI)

Shank	Clamp width S1 mm	Clamp width S2 mm	L1 mm	L2 mm	L3 mm	L4 mm	art.no.	€
VDI 20	6 - 45	45 - 100	77	99	34	18	461070 0020	529,-
VDI 30	6 - 45	45 - 100	77	99	34	18	461070 0030	599,-
VDI 40	6 - 56	56 - 110	79	111	34	18	461070 0040	649,-
VDI 50	6 - 56	56 - 110	79	111	34	18	461070 0050	859,-

4136



### With straight shank

Shank	Clamp width S1 mm	Clamp width S2 mm	L1 mm	L2 mm	L3 mm	L4 mm	art.no.	€
Ø 20	6 - 45	45 - 100	77	99	34	18	461071 0020	619,-
Ø 25	6 - 45	45 - 100	77	99	34	18	461071 0025	619,-
Ø 32	6 - 45	45 - 100	77	99	34	18	461071 0032	619,-
Ø 40	6 - 56	56 - 110	79	111	34	18	461071 0040	699,-

4136

### Indexable jaw set

for tool holder		art.no.	€
VDI and cylindrical shank		461072 0001	260,-

4136



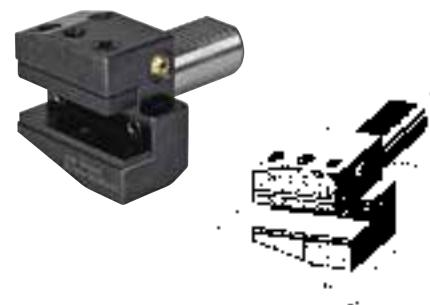
## SARA® Square transverse holding fixture

- Surface hardness 58 - 60 HRC
- Core strength HV 950 N/mm<sup>2</sup>
- Case depth 0.8 mm ± 0.2 mm
- Fully burnished and precision-ground

### Type B1, right, short

Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	art.no.	€
VDI 20	20	55	30	16	7	25	30	30	16	<b>446005 0020</b>	<b>59,-</b>
VDI 30	30	70	35	20	10	28	38	40	22	446005 0030	<b>65,60</b>
VDI 40	40	85	42.5	25	12.5	32.5	48	44	22	446005 0040	<b>73,30</b>
VDI 50	50	100	50	32	16	35	60	55	30	446005 0050	<b>96,20</b>

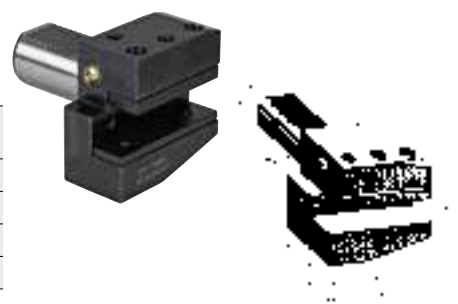
4134



### Type B2, left, short

Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	art.no.	€
VDI 20	20	55	30	16	7	25	30	30	16	<b>446007 0020</b>	<b>59,-</b>
VDI 30	30	70	35	20	10	28	38	40	22	446007 0030	<b>65,60</b>
VDI 40	40	85	42.5	25	12.5	32.5	48	44	22	446007 0040	<b>73,30</b>
VDI 50	50	100	50	32	16	35	60	55	30	446007 0050	<b>96,20</b>

4134



### Type B3, overhead right, short

Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	art.no.	€
VDI 20	20	55	30	16	7	25	30	30	16	<b>446009 0020</b>	<b>61,60</b>
VDI 30	30	70	35	20	10	35	38	40	22	446009 0030	<b>67,70</b>
VDI 40	40	85	42.5	25	12.5	42.5	48	44	22	446009 0040	<b>75,30</b>
VDI 50	50	100	50	32	16	50	60	55	30	446009 0050	<b>104,-</b>

4134



### Type B4, overhead left, short

Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	art.no.	€
VDI 20	20	55	30	16	7	25	30	30	16	<b>446011 0020</b>	<b>61,60</b>
VDI 30	30	70	35	20	10	35	38	40	22	446011 0030	<b>67,70</b>
VDI 40	40	85	42.5	25	12.5	42.5	48	44	22	446011 0040	<b>75,30</b>
VDI 50	50	100	50	32	16	50	60	55	30	446011 0050	<b>104,-</b>

4134



## SARA® Square longitudinal holding fixture

- Surface hardness 58 - 60 HRC
- Core strength HV 950 N/mm<sup>2</sup>
- Case depth 0.8 mm ± 0.2 mm
- Fully burnished and precision-ground

### Type C1, right

Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	art.no.	€
VDI 20	20	52	27	16	13	25	30	7	50	446021 0020	73,30
VDI 30	30	70	35	20	17	28	38	10	70	446021 0030	73,30
VDI 40	40	85	42.5	25	21	32.5	48	12.5	85	446021 0040	87,-
VDI 50	50	100	50	32	26	35	60	16	100	446021 0050	111,-

4134

### Type C2, left

Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	art.no.	€
VDI 20	20	65	40	16	26	25	30	7	50	446023 0020	70,20
VDI 30	30	76	41	20	23	28	38	10	70	446023 0030	70,20
VDI 40	40	90	47.5	25	25.5	32.5	48	12.5	85	446023 0040	83,40
VDI 50	50	105	55	32	30.5	35	60	16	100	446023 0050	111,-

4134

### Type C3, overhead right

Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	art.no.	€
VDI 20	20	52	27	16	13	30	25	7	50	446025 0020	75,30
VDI 30	30	70	35	20	17	38	35	10	70	446025 0030	81,40
VDI 40	40	85	42.5	25	21	48	42.5	12.5	85	446025 0040	89,-
VDI 50	50	100	50	32	26	60	50	16	100	446025 0050	137,50

4134

### Type C4, overhead left

Shank	d1 mm	b4 mm	b5 mm	b6 mm	h1 mm	h5 mm	h6 mm	l1 mm	l2 mm	art.no.	€
VDI 20	20	65	40	26	16	30	25	7	50	446027 0020	75,30
VDI 30	30	76	41	23	20	38	35	10	70	446027 0030	81,40
VDI 40	40	90	47.5	25.5	25	48	42.5	12.5	85	446027 0040	89,-
VDI 50	50	105	55	30.5	32	60	50	16	100	446027 0050	137,50

4134

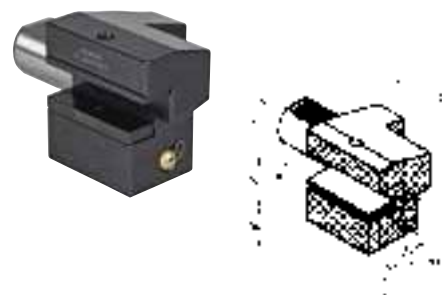
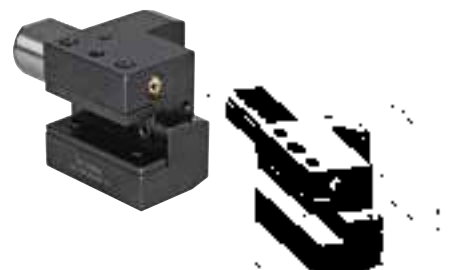
## SARA® Morse taper holding fixture

- Surface hardness 58 - 60 HRC
- Core strength HV 950 N/mm<sup>2</sup>
- Case depth 0.8 mm ± 0.2 mm
- Fully burnished and precision-ground

### Type F1, for tools with Morse tapers and tangs

Shank design interior	Shank	d1 mm	d3 mm	d4 mm	d2 mm	h1 mm	l1 mm	l2 mm	art.no.	€
MT 1	VDI 20	20	50	12.075	-	23	23	-	446029 0021	73,30
MT 1	VDI 30	30	68	12.07	-	28	27	-	446029 0031	73,30
MT 1	VDI 40	40	83	12.07	55	32.5	36	22	446029 0041	75,30
MT 2	VDI 20	20	50	17.78	40	23	90	30	446029 0022	70,70
MT 2	VDI 30	30	68	17.78	-	28	27	-	446029 0032	70,70
MT 2	VDI 40	40	83	17.78	55	32.5	36	22	446029 0042	73,30
MT 2	VDI 50	50	98	17.78	55	35	36	30	446029 0052	96,20
MT3	VDI 30	30	68	23.83	58	28	66	22	446029 0033	70,70
MT3	VDI 40	40	83	23.83	55	32.5	36	22	446029 0043	73,30
MT3	VDI 50	50	98	23.83	58	35	36	30	446029 0053	96,20
MT 4	VDI 40	40	83	31.27	68	32.5	80	22	446029 0044	73,30
MT 4	VDI 50	50	98	31.27	68	35	50	30	446029 0054	96,20

4134



## SARA® Tool holders for drilling tools

- Surface hardness 58 - 60 HRC
- Core strength HV 950 N/mm<sup>2</sup>
- Case depth 0.8 mm ± 0.2 mm
- Fully burnished and precision-ground

### Type E1, for straight shank drilling tools with an internal coolant supply

Shank	d1 mm	d4 mm	d3 mm	h1 mm	l1 mm	l2 mm	d2 mm	l3 mm	art.no.	€
VDI 20	20	20	50	18	67	16	40	49	<b>446031 2020</b>	<b>73,30</b>
VDI 20	20	25	50	18	71	16	45	53	446031 2025	<b>73,30</b>
VDI 30	30	20	68	28	67	22	40	45	446031 3020	<b>73,30</b>
VDI 30	30	25	68	28	71	22	45	49	446031 3025	<b>73,30</b>
VDI 30	30	32	68	28	75	22	52	53	446031 3032	<b>73,30</b>
VDI 30	30	40	68	28	95	22	60	73	446031 3040	<b>73,30</b>
VDI 40	40	20	83	32.5	67	22	40	45	446031 4020	<b>79,40</b>
VDI 40	40	25	83	32.5	75	22	45	53	446031 4025	<b>79,40</b>
VDI 40	40	32	83	32.5	75	22	52	53	446031 4032	<b>79,40</b>
VDI 40	40	40	83	32.5	90	22	60	68	446031 4040	<b>79,40</b>
VDI 50	50	25	98	35	80	30	45	50	446031 5025	<b>102,-</b>
VDI 50	50	32	98	35	80	30	52	50	446031 5032	<b>102,-</b>
VDI 50	50	40	98	35	90	30	65	60	446031 5040	<b>102,-</b>
VDI 50	50	50	98	35	100	30	75	70	446031 5050	<b>102,-</b>

4134



### Type E2, for straight shank turning tools with an internal and external coolant supply

Shank	d1 mm	d4 mm	d3 mm	h1 mm	l1 mm	l2 mm	d2 mm	l3 mm	art.no.	€
VDI 20	20	8	50	23	18	50	40	32	<b>446033 2008</b>	<b>68,70</b>
VDI 20	20	10	50	23	18	50	40	32	446033 2010	<b>68,70</b>
VDI 20	20	12	50	23	18	50	40	32	446033 2012	<b>68,70</b>
VDI 20	20	16	50	23	18	50	40	32	446033 2016	<b>68,70</b>
VDI 20	20	20	50	23	18	50	50	32	446033 2020	<b>68,70</b>
VDI 20	20	25	50	23	18	60	50	42	446033 2025	<b>68,70</b>
VDI 30	30	8	68	28	22	60	55	38	446033 3008	<b>68,70</b>
VDI 30	30	10	68	28	22	60	55	38	446033 3010	<b>68,70</b>
VDI 30	30	12	68	28	22	60	55	38	446033 3012	<b>68,70</b>
VDI 30	30	16	68	28	22	60	55	38	446033 3016	<b>68,70</b>
VDI 30	30	20	68	28	22	60	55	38	446033 3020	<b>68,70</b>
VDI 30	30	25	68	28	22	60	55	38	446033 3025	<b>68,70</b>
VDI 30	30	32	68	28	22	75	68	53	446033 3032	<b>68,70</b>
VDI 30	30	40	68	28	22	90	68	68	446033 3040	<b>68,70</b>
VDI 40	40	8	83	32.5	22	75	55	53	446033 4008	<b>69,70</b>
VDI 40	40	10	83	32.5	22	75	55	53	446033 4010	<b>69,70</b>
VDI 40	40	12	83	32.5	22	75	55	53	446033 4012	<b>69,70</b>
VDI 40	40	16	83	32.5	22	75	55	53	446033 4016	<b>69,70</b>
VDI 40	40	20	83	32.5	22	75	55	53	446033 4020	<b>69,70</b>
VDI 40	40	25	83	32.5	22	75	55	53	446033 4025	<b>69,70</b>
VDI 40	40	32	83	32.5	22	75	83	53	446033 4032	<b>69,70</b>
VDI 40	40	40	83	32.5	22	90	83	68	446033 4040	<b>69,70</b>
VDI 50	50	12	98	35	30	90	68	60	446033 5012	<b>96,20</b>
VDI 50	50	16	98	35	30	90	68	60	446033 5016	<b>96,20</b>
VDI 50	50	20	98	35	30	90	68	60	446033 5020	<b>96,20</b>
VDI 50	50	25	98	35	30	90	68	60	446033 5025	<b>96,20</b>
VDI 50	50	32	98	35	30	90	68	60	446033 5032	<b>96,20</b>
VDI 50	50	40	98	35	30	90	98	60	446033 5040	<b>96,20</b>
VDI 50	50	50	98	35	30	100	98	70	446033 5050	<b>96,20</b>

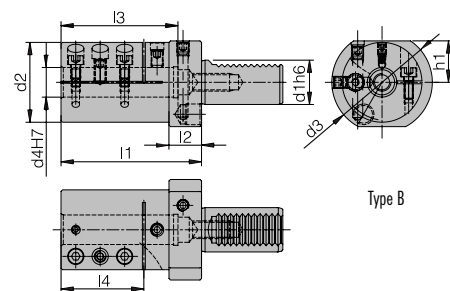
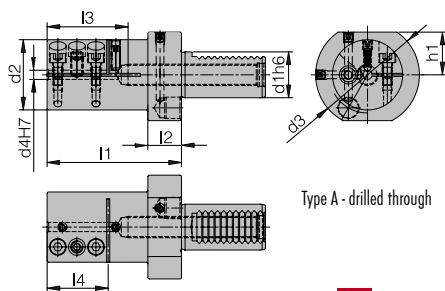
4134



Continued on next page &gt;&gt;&gt;

**Form E2S, for straight shank turning tools, slotted**

- Vibration-damping clamping of solid carbide and vibration-dampened boring bars due to large clamping length
- No shortening of boring bars necessary
- Internal and external cooling
- Easy height adjustment of the indexable insert using EASY-FIX screw for the V-groove and clamping screw for the surface



d1 mm	d2 mm	d3 mm	d4 mm	h1 mm	l1 mm	l2 mm	l3 mm	l4 mm	Type	art.no.	€
30	46	68	10	28	88	22	65	40	A	<b>446133 3010</b>	<b>127,50</b>
30	46	68	12	28	88	22	65	40	A	446133 3012	127,50
30	50	68	16	28	88	22	70	48	A	446133 3016	127,50
30	54	68	20	28	96	22	80	56	B	446133 3020	127,50
30	58	68	25	28	112	22	100	62.5	B	446133 3025	127,50
30	63	68	32	28	142	22	128	80	B	446133 3032	136,50
30	73	68	40	28	174	22	150	100	B	446133 3040	149,50
40	46	83	10	32.5	88	22	65	40	A	446133 4010	136,50
40	46	83	12	32.5	88	22	65	40	A	446133 4012	136,50
40	50	83	16	32.5	88	22	70	48	A	446133 4016	136,50
40	54	83	20	32.5	96	22	80	56	A	446133 4020	136,50
40	58	83	25	32.5	112	22	100	62.5	B	446133 4025	136,50
40	63	83	32	32.5	142	22	128	80	B	446133 4032	142,50
40	73	83	40	32.5	174	22	150	100	B	446133 4040	164,-
40	83	98	50	35	182	30	160	100	B	446133 4050	189,50

4194



**SARA® Hydraulic clamping system HYDRO-FIX**

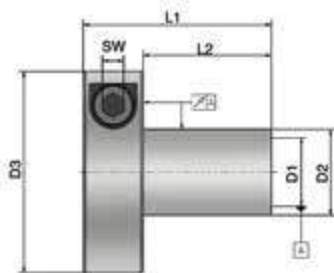
**Hydraulic clamping system for boring bars and powered tools**

The system is attached and clamped with just one screw. The clamp engages evenly with the workpiece and this increases the tool service life. The hydraulic clamping system absorbs and reduces vibrations, and thus increases the surface quality.

The equal and complete clamping of the shank significantly reduces the vibration amplitude.

**HYDRO-FIX** clamps simultaneously in both directions, the tool and in the tool holder.

- Reduced vibrations
- Increased cutting speeds and/or feed rates
- Improved surface quality
- Increased tool life
- Quick and easy to handle
- Recommended shank tolerance h7
- Recommended bore tolerance H7



powered by ETP

**For boring bars**

D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	Wr. width mm	art.no.	€
12	16	43.5	38	24	5	<b>433805 1216</b>	<b>385,-</b>
16	20	47	44	30	5	433805 1620	385,-
20	25	52	44	30	5	433805 2025	385,-
25	32	59	48	34	5	433805 2532	410,-
32	40	69.5	53	39	5	433805 3240	440,-

4130



## SARA® Reducing bush for boring bar holders

### With clamping screws or slotted hole design

d1 mm	d2 mm	d3 mm	F mm	K mm	X mm	Y mm	Illustration	art.no.	€
25	8	30	50	-	-	-	1	<b>446134 2508</b>	<b>34,60</b>
25	10	30	50	-	-	-	1	446134 2510	<b>34,60</b>
25	12	30	50	-	-	-	1	446134 2512	<b>34,60</b>
25	16	30	50	13	45.5	3.5	2	446134 2516	<b>34,60</b>
25	20	30	50	13	45.5	3.5	2	446134 2520	<b>34,60</b>
32	8	37	59	-	-	-	1	446134 3208	<b>36,70</b>
32	10	37	59	-	-	-	1	446134 3210	<b>36,70</b>
32	12	37	59	-	-	-	1	446134 3212	<b>36,70</b>
32	16	37	59	-	-	-	1	446134 3216	<b>36,70</b>
32	20	37	59	13	51	5	2	446134 3220	<b>38,80</b>
32	25	37	59	13	51	5	2	446134 3225	<b>38,80</b>
40	8	45	69	-	-	-	1	446134 4008	<b>38,80</b>
40	10	45	69	-	-	-	1	446134 4010	<b>38,80</b>
40	12	45	69	-	-	-	1	446134 4012	<b>38,80</b>
40	16	45	69	-	-	-	1	446134 4016	<b>38,80</b>
40	20	45	69	-	-	-	1	446134 4020	<b>38,80</b>
40	25	45	69	-	-	-	1	446134 4025	<b>38,80</b>
40	32	45	69	17	61	5	2	446134 4032	<b>42,10</b>

4194

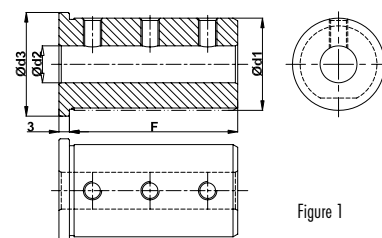


Figure 1

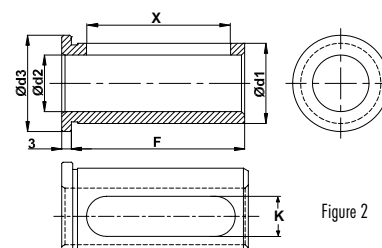


Figure 2

### Slotted design

NEW

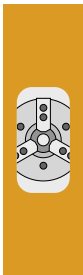
D mm	Ø mm	D1 mm	L1 mm	L2 mm	art.no.	€
20	8	24	50	4	<b>446135 2008</b>	<b>32,60</b>
20	10	24	50	4	446135 2010	<b>32,60</b>
20	12	24	50	4	446135 2012	<b>32,60</b>
20	14	24	50	4	446135 2014	<b>32,60</b>
20	16	24	50	4	446135 2016	<b>32,60</b>
25	8	29	50	4	446135 2508	<b>36,70</b>
25	10	29	50	4	446135 2510	<b>36,70</b>
25	12	29	50	4	446135 2512	<b>36,70</b>
25	14	29	50	4	446135 2514	<b>36,70</b>
25	16	29	50	4	446135 2516	<b>36,70</b>
25	18	29	50	4	446135 2518	<b>36,70</b>
25	20	29	50	4	446135 2520	<b>36,70</b>
32	8	36	60	4	446135 3208	<b>39,70</b>
32	10	36	60	4	446135 3210	<b>39,70</b>
32	12	36	60	4	446135 3212	<b>39,70</b>
32	14	36	60	4	446135 3214	<b>39,70</b>
32	16	36	60	4	446135 3216	<b>39,70</b>
32	18	36	60	4	446135 3218	<b>39,70</b>

4194

NEW

D mm	Ø mm	D1 mm	L1 mm	L2 mm	art.no.	€
32	20	36	60	4	446135 3220	<b>39,70</b>
32	25	36	60	4	446135 3225	<b>39,70</b>
40	10	75	75	4	446135 4010	<b>41,70</b>
40	12	75	75	4	446135 4012	<b>41,70</b>
40	14	75	75	4	446135 4014	<b>41,70</b>
40	16	75	75	4	446135 4016	<b>41,70</b>
40	18	75	75	4	446135 4018	<b>41,70</b>
40	20	75	75	4	446135 4020	<b>41,70</b>
40	25	75	75	4	446135 4025	<b>41,70</b>
40	32	75	75	4	446135 4032	<b>41,70</b>
50	20	75	75	4	446135 5020	<b>56,-</b>
50	25	75	75	4	446135 5025	<b>56,-</b>
50	32	75	75	4	446135 5032	<b>56,-</b>
50	40	75	75	4	446135 5040	<b>56,-</b>
60	25	75	75	4	446135 6025	<b>76,30</b>
60	32	75	75	4	446135 6032	<b>76,30</b>
60	40	75	75	4	446135 6040	<b>76,30</b>
60	50	75	75	4	446135 6050	<b>76,30</b>

4194



Over 200,000 tools available online!

Register online now!

[www.saratools.com](http://www.saratools.com)



## SARA® Collet holder for DIN 6499 collets (ER)

- Surface hardness 58 - 60 HRC
- Core strength HV 950 N/mm<sup>2</sup>
- Case depth 0.8 mm ± 0.2 mm
- Fully burnished and precision-ground
- Additional versions available on request
- When selecting collets, type B is preferable.



### Type E4, straight holding fixture with collet

Shank	Designation	Clamping range mm	d1 mm	h1 mm	l2 mm	l1 mm	d3 mm	art.no.	€
VDI 20	ER16 426E	1 - 10	20	23	40	16	50	446036 2016	88,-
VDI 20	ER25 430E	2 - 16	20	23	50	16	50	446036 2025	88,-
VDI 20	ER32 470E	2 - 20	20	23	50	16	50	446036 2032	88,-
VDI 30	ER25 430E	2 - 16	30	28	57	22	68	446036 3025	90,60
VDI 30	ER32 470E	2 - 20	30	28	62	22	68	446036 3032	90,60
VDI 30	ER40 472E	3 - 26	30	28	75	22	68	446036 3040	90,60
VDI 40	ER25 430E	2 - 16	40	32.5	75	22	83	446036 4025	90,60
VDI 40	ER32 470E	2 - 20	40	32.5	62	22	83	446036 4032	90,60
VDI 40	ER40 472E	3 - 26	40	32.5	75	22	83	446036 4040	90,60
VDI 50	ER40 472E	3 - 26	50	35	75	30	98	446036 5040	131,50

4134

## ATORN® Precision drill chuck with spur gear system

- **Clamping via spur gear system**
- **Suitable for clockwise and anti-clockwise rotation**
- Short clamping and retrofitting times
- Very short design
- For CNC lathes, for drilling, reaming, countersinking, thread cutting

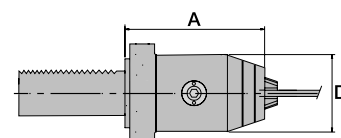


### VDI tool holding fixture, DIN 69880

- Central coolant supply

Shank	Clamping range mm	A mm	D mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
VDI 30	0.5 - 16	95	57	20	90	6	0.02	440138 3016	370,-
VDI 40	0.5 - 16	95	57	20	90	6	0.02	440138 4016	410,-

4101



## ATORN® Precision drill chuck with worm gear

- **Clamping by means of an integrated worm gear**
- **Suitable for clockwise and anti-clockwise rotation**
- Clamping range 1.0 to 16.0 mm
- Long service life, wearing parts hardened and ground
- Supplied with hexagonal key

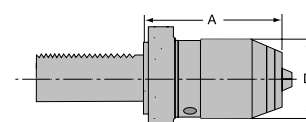


### DIN 69880 (VDI)

- Internal coolant supply

Shank	Clamping range mm	A mm	D mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
VDI 30	1 - 16	87	50	10	90	4	0.03	441015 3016	346,-
VDI 40	1 - 16	87	50	10	90	4	0.03	441015 4016	375,-

4101

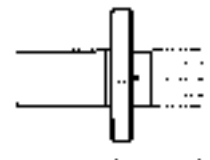


## SARA® Thread cutting quick-change chuck

- Automatically locks inserts in the chuck
- Flexible length compensation under compression and tension

Shank	d mm	D mm	L mm	Length compensation, pressure mm	Length compensation, tension mm	Thread	art.no.	€
VDI 30	19	38	55	7	7	M 3 - M 14	442009 3012	244,-
VDI 30	31	54	77	12	12	M 5 - M 22	442009 3024	270,-
VDI 40	19	38	55	7	7	M 3 - M 14	442009 4012	234,-
VDI 40	31	54	77	12	12	M 5 - M 22	442009 4024	270,-

4134



## Threading die holder Synchro

- For threading dies
- Synchronised thread cutting with threading dies on CNC machines
- Cooling lubricant discharged through the threading die (IC) = optimum lubrication
- Supplied without threading die

### VDI base holder

- For holding interchangeable threading die inserts

Shank	art.no.	€
VDI 20	442014 0020	141,50
VDI 30	442014 0030	141,50
VDI 40	442014 0040	141,50

4135



Base holders with interchangeable inserts



### Threading die interchangeable inserts

- For VDI base holders

suitable for threading die	External Ø mm	L3 mm	art.no.	€
M1 - M2.5 / Ø16	26	74	442015 0102	81,90
M3 - M4 / Ø20	30	74	442015 0304	81,90
M5 - M6 / Ø20	30	74	442015 0506	81,90
M7 - M9 / Ø25	35	74	442015 0709	81,90
M10 / Ø30	40	74	442015 0010	88,50
M12 - M14 / Ø38	48	74	442015 1214	90,60
M16 - M20 / Ø45	55	84	442015 1620	90,60

4135



## SARA® Protective plugs

### Type Z2, steel

Shank	Design	d1 mm	d2 mm	h1 mm	l1 mm	l2 mm	Steel art.no.	€
VDI 20	With additional underside surface area	20	50	23	56	16	446039 0020	31,70
VDI 30	With additional underside surface area	30	68	28	75	20	446039 0030	23,-
VDI 40	Standard	40	83	32.5	83	20	446039 0040	26,40
VDI 50	Standard	50	98	35	98	20	446039 0050	33,30

4134



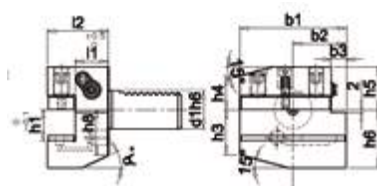
### Type Z2, plastic

Shank	d1 mm	d2 mm	h1 mm	l1 mm	l2 mm	Plastic art.no.	€
VDI 20	20	50	23	56	16	446040 2055	14,50
VDI 30	30	68	28	75	20	446040 3080	10,55
VDI 40	40	83	32.5	83	20	446040 4085	11,85
VDI 50	50	98	35	98	20	446040 5085	19,75

4134



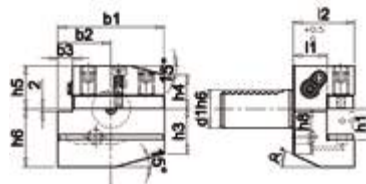
**SARA® Square radial holding fixture with internal coolant supply**



**Form B1, right-hand, short version**

Shank	b1 mm	b2 mm	b3 mm	l1 mm	l2 mm	h1 mm	h3 mm	h4 mm	h5 mm	h6 mm	h8 mm	art.no.	€
VDI 20	70	35	10	22	40	16	29.5	22	31.5	38.5	30	446105 0020	90,10
VDI 30	70	35	10	22	40	20	26	22	28	38	30	446105 0030	96,20
VDI 40	85	42.5	12.5	22	44	25	35	30	32.5	48		446105 0040	108,50
VDI 50	85	42.5	12.5	22	44	25	35	30	32.5	48		446105 0050	173,-

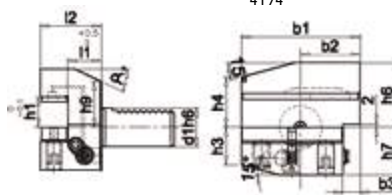
4194



**Form B2, left-hand, short version**

Shank	b1 mm	b2 mm	b3 mm	l1 mm	l2 mm	h1 mm	h3 mm	h4 mm	h5 mm	h6 mm	h8 mm	art.no.	€
VDI 20	70	35	10	22	40	16	29.5	22	31.5	38.5	30	446107 0020	102,-
VDI 30	70	35	10	22	40	20	26	22	28	38	30	446107 0030	108,50
VDI 40	85	42.5	12.5	22	44	25	35	30	32.5	48		446107 0040	117,-
VDI 50	85	42.5	12.5	22	44	25	35	30	32.5	48		446107 0050	173,-

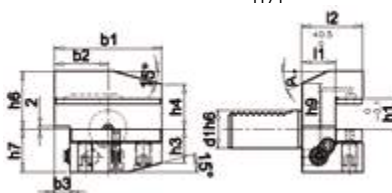
4194



**Form B3, overhead right-hand, short version**

Shank	b1 mm	b2 mm	b3 mm	l1 mm	l2 mm	h1 mm	h3 mm	h4 mm	h6 mm	h7 mm	h9 mm	art.no.	€
VDI 20	70	35	10	22	40	16	29.5	22	38.5	35	28	446109 0020	90,10
VDI 30	70	35	10	22	40	20	26	22	38	35	28	446109 0030	96,20
VDI 40	85	42.5	12.5	22	44	25	35	30	48	42.5		446109 0040	108,50
VDI 50	85	42.5	12.5	22	44	25	35	30	48	42.5		446109 0050	173,-

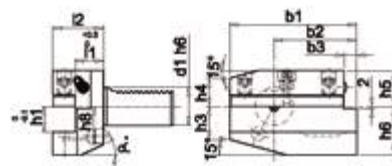
4194



**Form B4, overhead left-hand, short version**

Shank	b1 mm	b2 mm	b3 mm	l1 mm	l2 mm	h1 mm	h3 mm	h4 mm	h6 mm	h7 mm	h9 mm	art.no.	€
VDI 20	70	35	10	22	40	16	29.5	22	38.5	35	28	446111 0020	102,-
VDI 30	70	35	10	22	40	20	26	22	38	35	28	446111 0030	108,50
VDI 40	85	42.5	12.5	22	44	25	35	30	48	42.5		446111 0040	117,-
VDI 50	85	42.5	12.5	22	44	25	35	30	48	42.5		446111 0050	173,-

4194



**Form B5, right-hand, long version**

Shank	b1 mm	b2 mm	b3 mm	l1 mm	l2 mm	h1 mm	h3 mm	h4 mm	h5 mm	h6 mm	art.no.	€
VDI 30	118	75.5	12.5	22	44	25	35	30	32.5	48	446112 0030	171,-
VDI 40	130	80	16	30	55	32	42	35	35	60	446112 0040	205,-
VDI 50	145	82.5	16	30	60	32	46	42.5	42.5	62.5	446112 0050	297,-

4194





**SARA® Accessories for VDI holding fixtures with internal coolant supply**

**Coolant hose set**

- Up to 150 bar coolant pressure

Description	L mm	art.no.	€
Coolant hose with adapter G1/8 inch-M12 x 1.5	200	<b>446312 0200</b>	<b>30,60</b>
Coolant hose with adapter G1/8 inch-M12 x 1.5	300	446312 0300	34,80

4194



**Spacer**

- Allows reduction to the next-smallest indexable insert holder without wearing the nut
- Ground version
- Metallic sealing

L mm	B mm	D mm	art.no.	€
69	17	4	<b>446313 0030</b>	<b>15,80</b>
84	21	5	446313 0040	16,80

4194



# Clamping jaw finder



- Jaws for approx. 3,000 different chuck types
- Find the right jaws for your chuck quickly and easily.
- Easy to find and quick to order with lightning-fast delivery!



[www.spannbackenfinder.de](http://www.spannbackenfinder.de)



... precise and powerful.

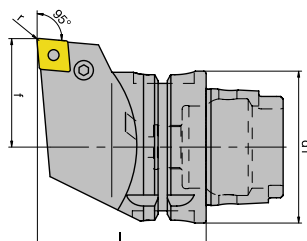
Multiple clamping ...

**ATORN®**  
Performance demands quality

## KINTEK HSK-T rotary holder

### • DIN 69893 Form T (HSK-T)

- Alloyed case-hardened steel with a core tensile strength of 800-1000N/mm<sup>2</sup>
- case-hardened to HRC 58 ± 2
- Case depth 0.4-0.5mm
- Finishing of fitting key according to ICTM tolerances

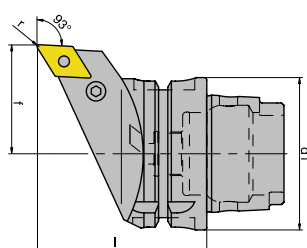


### PCLN-R/L rotary holder for CNM. 1204.. and 1604..

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	f mm	r mm	art.no.	€
PCLN-L 12	HSK 63	CNM. 1204..	63	70	45	0.8	435001 0012	227,-
PCLN-L 16	HSK 63	CNM. 1606..	63	70	45	0.8	435001 0016	227,-
PCLN-R 12	HSK 63	CNM. 1204..	63	70	45	0.8	435001 1012	227,-
PCLN-R 16	HSK 63	CNM. 1606..	63	70	45	0.8	435001 1016	227,-

4194

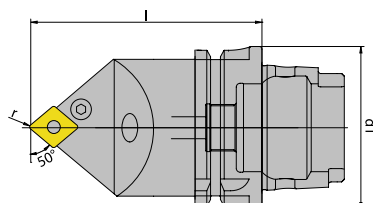


### PDJN-R/L rotary holder for DNM. 1506..

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	f mm	r mm	art.no.	€
PDJN-L 15	HSK 63	DNM. 1506..	63	70	45	0.8	435002 0015	227,-
PDJN-R 15	HSK 63	DNM. 1506..	63	70	45	0.8	435002 1015	227,-

4194

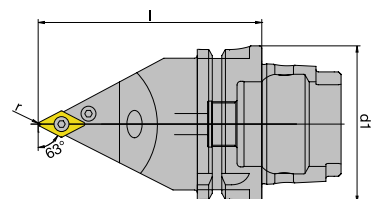


### PCMNR rotary holder for CN.. 1204..

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	r mm	art.no.	€
PCMNR 12-90	HSK 63	CN.. 1204..	63	90	0.8	435003 0090	239,-
PCMNR 12-100	HSK 63	CN.. 1204..	63	100	0.8	435003 0100	266,-
PCMNR 12-145	HSK 63	CN.. 1204..	63	145	0.8	435003 0145	275,-

4194



### PDNNR rotary holder for DN.. 1506..

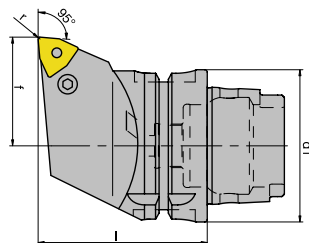
- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	r mm	art.no.	€
PDNNR 15-90	HSK 63	DN.. 1506..	63	90	0.8	435004 0090	245,-
PDNNR 15-100	HSK 63	DN.. 1506..	63	100	0.8	435004 0100	266,-
PDNNR 15-145	HSK 63	DN.. 1506..	63	145	0.8	435004 0145	287,-

4194



Continued on next page &gt;&gt;&gt;

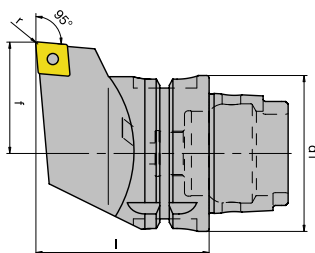


**PWLN-R/L rotary holder for WN.. 0804..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	f mm	r mm	art.no.	€
PWLN-L 08	HSK 63	WN.. 0804..	63	70	45	0.8	435005 0008	227,-
PWLN-R 08	HSK 63	WN.. 0804..	63	70	45	0.8	435005 1008	227,-

4194

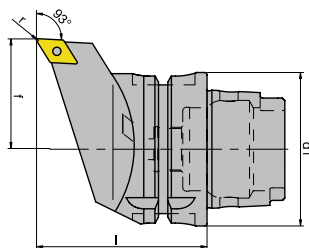


**SCLC-R/L rotary holder for CC.. 1204..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	f mm	r mm	art.no.	€
SCLC-L 12	HSK 63	CC.. 1204..	63	70	45	0.8	435006 0012	227,-
SCLC-R 12	HSK 63	CC.. 1204..	63	70	45	0.8	435006 1012	227,-

4194

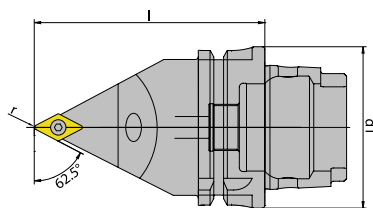


**SDJC-R/L rotary holder for DC.. 11T3..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	f mm	r mm	art.no.	€
SDJCL 11	HSK 63	DC.. 11T3..	63	70	45	0.8	435007 0011	227,-
SDJCR 11	HSK 63	DC.. 11T3..	63	70	45	0.8	435007 1011	227,-

4194



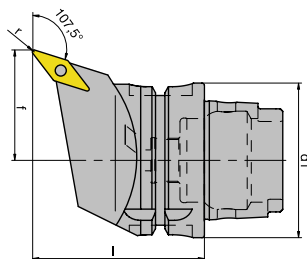
**SDNCN rotary holder for DC.. 11T3..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	r mm	art.no.	€
SDNCN 11-145	HSK 63	DC.. 11T3..	63	145	0.8	435008 1145	287,-

4194



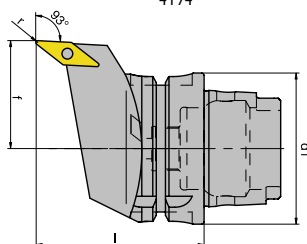


**SVHC-R/L rotary holder for VC.. 1604..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	f mm	r mm	art.no.	€
SVHCL 16	HSK 63	VC.. 1604..	63	70	45	0.8	435009 0016	227,-
SVHCR 16	HSK 63	VC.. 1604..	63	70	45	0.8	435009 1016	227,-

4194

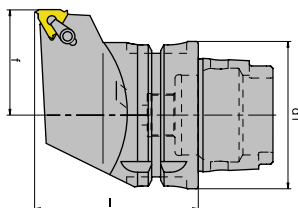
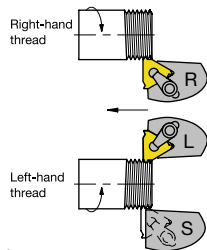


**SVJB-R/L rotary holder for VB.. 1604..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063... should be used

ISO designation	Shank	for indexable inserts	d1 mm	l mm	f mm	r mm	art.no.	€
SVJBL 16	HSK 63	VB.. 1604..	63	75	45	0.8	435010 0016	227,-
SVJBR 16	HSK 63	VB.. 1604..	63	75	45	0.8	435010 1016	227,-

4194



**THE-R/L rotary holder for threading inserts**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063... should be used

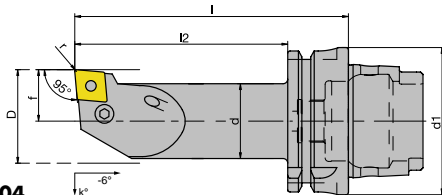
ISO designation	Shank	d1 mm	l mm	f mm	r mm	art.no.	€
THE-L 16	HSK 63	63	70	45	16EL	435011 0016	232,-
THE-R 16	HSK 63	63	70	45	16ER	435011 1016	232,-

4194

**KINTEK HSK-T boring bar rotary holder**

**NEW**

- **DIN 69893 Form T (HSK-T)**
- Alloyed case-hardened steel with a core tensile strength of 800-1000N/mm<sup>2</sup>
- case-hardened to HRC 58 ± 2
- Case depth 0.4-0.5mm
- Finishing of fitting key according to ICTM tolerances



**PCLN-R/L boring bar rotary holder for CNM. 1204..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063... should be used

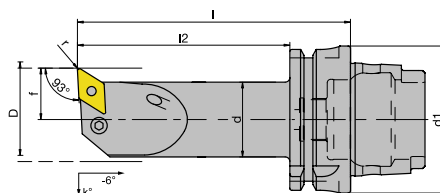
ISO designation	Shank	for indexable inserts	d1 mm	d mm	l mm	l2 mm	f mm	k mm	D mm	r mm	art.no.	€
PCLN-L 12	HSK 63	CNM.1204..	63	25	100	74	17	-12°	32	0.8	435012 2512	227,-
PCLN-R 12	HSK 63	CNM.1204..	63	25	100	74	17	-12°	32	0.8	435012 2513	227,-
PCLN-L 12	HSK 63	CNM.1204..	63	32	120	94	22	-10°	40	0.8	435012 3212	237,-
PCLN-R 12	HSK 63	CNM.1204..	63	32	120	94	22	-10°	40	0.8	435012 3213	237,-
PCLN-L 12	HSK 63	CNM.1204..	63	40	140	114	27	-10°	50	0.8	435012 4012	237,-
PCLN-R 12	HSK 63	CNM.1204..	63	40	140	114	27	-10°	50	0.8	435012 4013	237,-

4194



Continued on next page >>>



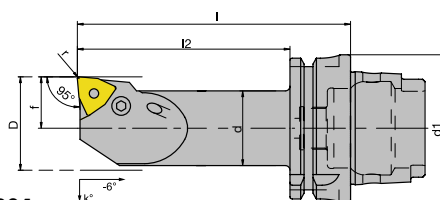


**PDUN-R/L boring bar rotary holder for DN.. 1506..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	d mm	l mm	l2 mm	f mm	k mm	D mm	r mm	art.no.	€
PDUN-L 15	HSK 63	DN..1506..	63	32	120	94	22	-15°	40	0.8	<b>435013 3215</b>	237,-
PDUN-R 15	HSK 63	DN..1506..	63	32	120	94	22	-15°	40	0.8	435013 3216	237,-
PDUN-L 15	HSK 63	DN..1506..	63	40	140	114	27	-12°	50	0.8	435013 4015	237,-
PDUN-R 15	HSK 63	DN..1506..	63	40	140	114	27	-12°	50	0.8	435013 4016	237,-

4194

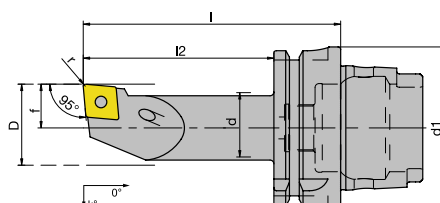


**PWLN-R/L boring bar rotary holder for WN.. 0804..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	d mm	l mm	l2 mm	f mm	k mm	D mm	r mm	art.no.	€
PWLN-L 08	HSK 63	WN..0804..	63	25	100	74	17	-12°	32	0.8	<b>435014 2508</b>	227,-
PWLN-R 08	HSK 63	WN..0804..	63	25	100	74	17	-12°	32	0.8	435014 2518	227,-
PWLN-L 08	HSK 63	WN..0804..	63	32	120	94	22	-12°	40	0.8	435014 3208	237,-
PWLN-R 08	HSK 63	WN..0804..	63	32	120	94	22	-12°	40	0.8	435014 3218	237,-
PWLN-L 08	HSK 63	WN..0804..	63	40	140	114	27	-10°	50	0.8	435014 4008	237,-
PWLN-R 08	HSK 63	WN..0804..	63	40	140	114	27	-10°	50	0.8	435014 4018	237,-

4194



**SCLC-R/L boring bar rotary holder for CC.. 09T3.. and 1204..**

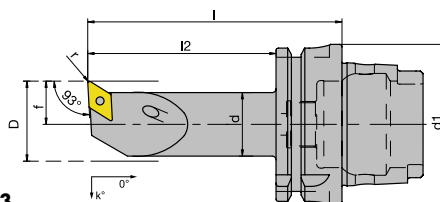
- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	d mm	l mm	l2 mm	f mm	k mm	D mm	r mm	art.no.	€
SCLC-L 09	HSK 63	CC..09T3..	63	20	85	59	13	-8°	25	0.8	<b>435015 2009</b>	227,-
SCLC-R 09	HSK 63	CC..09T3..	63	20	85	59	13	-8°	25	0.8	435015 2019	227,-
SCLC-L 12	HSK 63	CC..1204..	63	25	100	74	17	-5°	32	0.8	435015 2512	227,-
SCLC-R 12	HSK 63	CC..1204..	63	25	100	74	17	-5°	32	0.8	435015 2513	227,-

4194





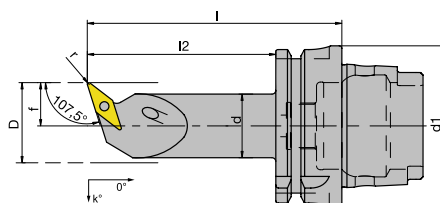


**SDUC-R/L boring bar rotary holder for DC.. 11T3..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	d mm	l mm	l2 mm	f mm	k mm	D mm	r mm	art.no.	€
SDUC-L 11	HSK 63	DC..11T3..	63	20	85	59	13	-8°	25	0.8	<b>435016 2011</b>	227,-
SDUC-R 11	HSK 63	DC..11T3..	63	20	85	59	13	-8°	25	0.8	435016 2012	227,-
SDUC-L 11	HSK 63	DC..11T3..	63	25	100	74	17	-5°	32	0.8	435016 2511	227,-
SDUC-R 11	HSK 63	DC..11T3..	63	25	100	74	17	-5°	32	0.8	435016 2512	227,-
SDUC-L 11	HSK 63	DC..11T3..	63	32	120	94	22	-5°	40	0.8	435016 3211	237,-
SDUC-R 11	HSK 63	DC..11T3..	63	32	120	94	22	-5°	40	0.8	435016 3212	237,-

4194

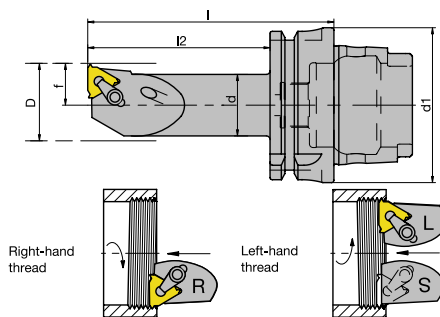
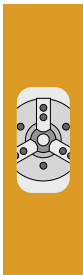


**SVQB-R/L boring bar rotary holder for VB.. 1604..**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	d mm	l mm	l2 mm	f mm	k mm	D mm	r mm	art.no.	€
SVQB-L 16	HSK 63	VB..1604..	63	32	120	94	22	-10°	40	0.8	<b>435017 3216</b>	237,-
SVQB-R 16	HSK 63	VB..1604..	63	32	120	94	22	-10°	40	0.8	435017 3217	237,-
SVQB-L 16	HSK 63	VB..1604..	63	40	140	114	27	-10°	50	0.8	435017 4016	237,-
SVQB-R 16	HSK 63	VB..1604..	63	40	140	114	27	-10°	50	0.8	435017 4017	237,-

4194



**THE-R/L boring bar rotary holder for threading inserts 16IR/L**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

ISO designation	Shank	for indexable inserts	d1 mm	d mm	l mm	l2 mm	f mm	D mm	art.no.	€
THEL 16	HSK 63	16IL	63	20	85	59	14	25	<b>435018 2016</b>	283,-
THER 16	HSK 63	16IR	63	20	85	59	14	25	435018 2017	283,-
THEL 16	HSK 63	16IL	63	25	100	74	16.5	32	435018 2516	283,-
THER 16	HSK 63	16IR	63	25	100	74	16.5	32	435018 2517	283,-
THEL 16	HSK 63	16IL	63	32	120	94	22	40	435018 3216	283,-
THER 16	HSK 63	16IR	63	32	120	94	22	40	435018 3217	283,-
THEL 16	HSK 63	16IL	63	40	140	114	27	50	435018 4016	301,-
THER 16	HSK 63	16IR	63	40	140	114	27	50	435018 4017	301,-

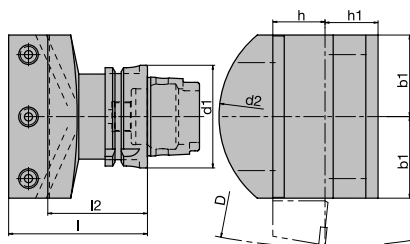
4194



## KINTEK HSK-T tool holder for clamp mounting

### • DIN 69893 Form T (HSK-T)

- Alloyed case-hardened steel with a core tensile strength of 800-1000N/mm<sup>2</sup>
- case-hardened to HRC 58 ± 2
- Case depth 0.4-0.5mm
- Finishing of fitting key according to ICTM tolerances

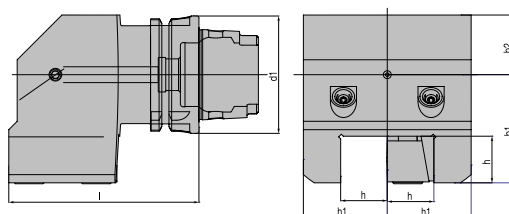


#### Tool holder, radial

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063... should be used

Shank	d1 mm	d2 mm	D mm	b1 mm	h mm	h1 mm	l mm	l2 mm	art.no.	€
HSK 63	63	130	340	50	32/25	32.5	85	50	435019 3225	331,-

4194

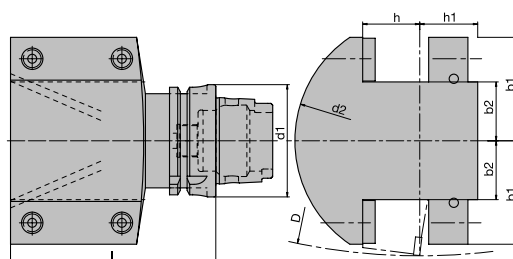


#### Tool holder, axial

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063... should be used

Shank	d1 mm	b1 mm	b2 mm	h mm	h1 mm	l mm	art.no.	€
HSK 63	63	58	32	25	45	102	435021 6325	390,-

4194

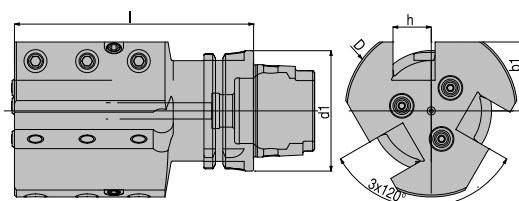


#### Tool holder, axial, 2-place

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063... should be used

Shank	d mm	d2 mm	D mm	b1 mm	b2 mm	h mm	h1 mm	l mm	art.no.	€
HSK 63	63	110	305	40	15	32/25	26.5	120	435020 2532	430,-
HSK 63	63	140	340	58	33	32/25	32.5	120	435020 3225	435,-

4194



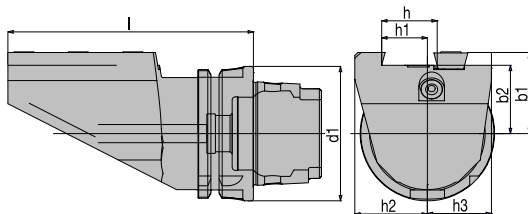
#### Tool holder, axial, 3-place

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063... should be used

Shank	d1 mm	D mm	b1 mm	b2 mm	h mm	l mm	art.no.	€
HSK 63	63	90	36	16	20	125	435022 0020	559,-

4194





**Grooving holder, axial**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

Shank	d1 mm	b1 mm	b2 mm	h mm	h1 mm	h2 mm	h3 mm	l mm	art.no.	€
HSK 63	63	38	32	26	21.4	34	30	115	<b>435023 0026</b>	405,-
HSK 63	63	38	32	32	25	38	33	150	435023 0032	405,-

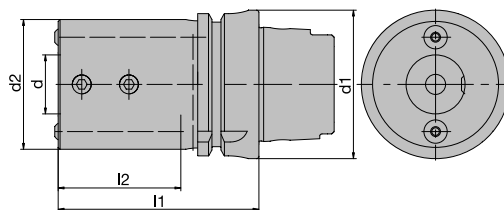
4194



**KINTEK HSK-T tool holder for boring bars and indexable insert drills**

**NEW**

- **DIN 69893 Form T (HSK-T)**
- Alloyed case-hardened steel with a core tensile strength of 800-1000N/mm<sup>2</sup>
- case-hardened to HRC 58 ± 2
- Case depth 0.4-0.5mm
- Finishing of fitting key according to ICTM tolerances

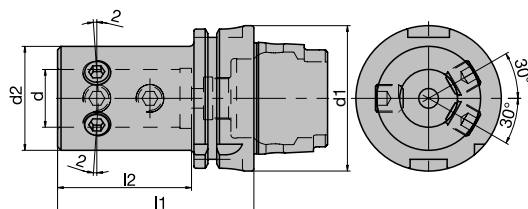


**Boring bar holder, axial**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

Shank	d1 mm	d mm	d2 mm	l1 mm	l2 mm	art.no.	€
HSK 63	63	8	32	70	40	<b>435024 6308</b>	158,-
HSK 63	63	10	38	75	45	435024 6310	158,-
HSK 63	63	12	40	75	45	435024 6312	147,50
HSK 63	63	16	45	80	50	435024 6316	147,50
HSK 63	63	20	50	80	50	435024 6320	147,50
HSK 63	63	25	55	85	52	435024 6325	147,50
HSK 63	63	32	72	95	58	435024 6332	147,50
HSK 63	63	40	80	120	72	435024 6340	147,50

4194



**Tool holder for indexable insert drills, axial**

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 4310110063.... should be used

Shank	d1 mm	d mm	d2 mm	l1 mm	l2 mm	art.no.	€
HSK 63	63	16	36	80	54	<b>435025 6316</b>	155,-
HSK 63	63	20	40	80	54	435025 6320	155,-
HSK 63	63	25	45	85	59	435025 6325	155,-
HSK 63	63	32	52	90	63	435025 6332	155,-
HSK 63	63	40	65	105	73	435025 6340	155,-

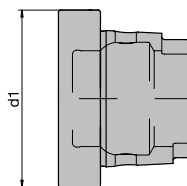
4194



## KINTEK HSK-T cover plate

NEW

- **DIN 69893 Form T (HSK-T)**
- Alloyed case-hardened steel with a core tensile strength of 800-1000N/mm<sup>2</sup>
- case-hardened to HRC 58 ± 2
- Case depth 0.4-0.5mm
- Finishing of fitting key according to ICTM tolerances



### Steel design

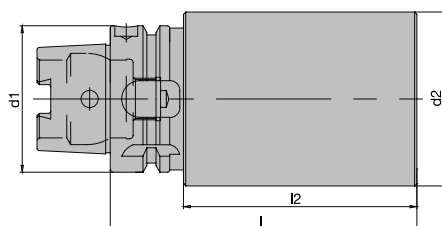
Shank	d1 mm	art.no.	€
HSK 63	63	<b>435026</b> 6363	<b>48,90</b>

4194

## KINTEK HSK-T blank for special tools

NEW

- **DIN 69893 Form T (HSK-T)**
- Alloyed case-hardened steel with a core tensile strength of 800-1000N/mm<sup>2</sup>
- case-hardened to HRC 58 ± 2
- Case depth 0.4-0.5mm
- Finishing of fitting key according to ICTM tolerances



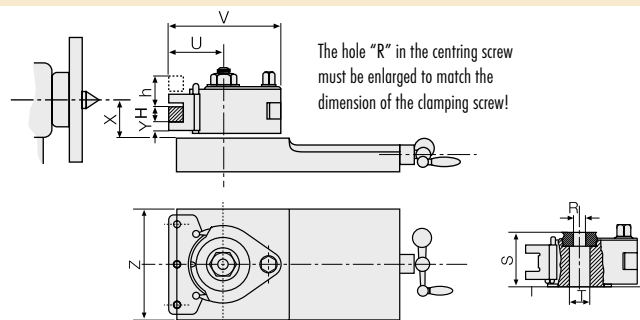
### Steel design

Shank	d1 mm	d2 mm	l mm	l2 mm	art.no.	€
HSK 63	63	80	190	158	<b>435027</b> 6301	<b>301,-</b>
HSK 63	63	130	95	63	435027 6302	<b>283,-</b>

4194

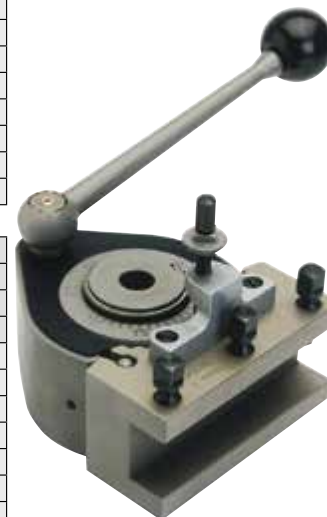
## ATORN® Quick-change tool holders

- Profile-ground, toothed central body attached to the lathe support along with the base body
- The base body can accommodate an unlimited number of interchangeable holders for turning or drilling tools, one after the other.
- 40 different steel holder angle settings possible
- Repeatability ± 0.01 mm



Technical data															
Change-holder size	D	Aa		A			B			C			D1		
		12	16	20	25	32	32	40	45	40	50	63			
Drive power max.	kW	1.1	2.2	2.2	6.6	6.6	13.2	13.2	13.2	22	22	22			
Slide width max.	Z mm	80	100	100	150	150	180	180	180	200	200	200			
Height adjustability	mm	10	14	14	22	14	40	36	32	38	28	24			
Steel support	Y mm	6.2	10	10	12	13.5	15	16.5	16.5	20	20	20			
Height of the mild steel max.	H mm	12	16	20	25	32	32	40	45	40	50	63			
Overall width max.	V mm	70	100	100	150	150	192	202	202	230	234	242			
Total height max.	S mm	37	54	54	75	75	105	105	105	122	122	122			
Projection max	U mm	30	48	48	71	71	92	102	102	112	116	124			
Bore Ø max.	T mm	12	35	35	40	40	55	55	55	65	65	65			

Minimum level required X for steel holder D															
Change-holder size	D	Aa		A			B			C			D1		
		12	16	20	25	32	32	40	45	40	50	63			
Steel holder H mm		X min. mm													
6	12														
8	14	17													
10	16	19	19												
12	18	21	21	24	25										
(14)		23	23	26	27	29									
16		25	25	28	29	31	31	31							
20				32	33	35	35	35							
25				37	38	40	40	40	45						
(30)					45	45	45	45	50	51	52				
32						47	47	47	52	52	52				
40							55	55	60	60	60				
45								60		65	65				
50										70	70				
63												83			



### Quick-release tool holder head with eccentric clamp

- Supplied with eccentric lever and square key for the holder
- Additional versions with different bores available on request

Holder size									art.no.	€
AA - D12	A1	B1	C1	D1	E1				446501 0012	262,-
A - D16/20	A2	B2	C2	D2	E2	F1	G1	H1	446501 1116	321,-
B - D25/32	A3	B3	C3	D3	E3	F2	G2	H2	446501 2225	475,-
C - D32/40/45	A4	B4	C4	D4	E4	F3	G3	H3	446501 3332	739,-
D1 - D40/50/63	A5	B5	C5	D5	E5	F4	G4	H4	446501 4440	1.289,-

4137

### Spare parts

Eccentric bolts		Protective cover with scale		Centring disc		Eccentric wrench	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
A1	446550 0012 51,90	B1	446551 0012 44,10	C1	446552 0012 14,-	D1	446553 0012 51,90
A2	446550 1116 46,60	B2	446551 1116 23,80	C2	446552 1116 13,20	D2	446553 1116 56,-
A3	446550 2225 71,20	B3	446551 2225 31,60	C3	446552 2225 14,-	D3	446553 2225 68,20
A4	446550 3332 79,40	B4	446551 3332 42,30	C4	446552 3332 23,80	D4	446553 3332 68,20
A5	446550 4440 97,20	B5	446551 4440 115,-	C5	446552 4440 34,40	D5	446553 4440 105,-
4137		4137		4137		4137	







Retaining strap with eccentric bolt		Plunger		Plunger spring		Pointer	
art.no.	€	art.no.	€	art.no.	€	art.no.	€
E1	446560 0012 170,50	F1	446562 1116 4,80	G1	446563 1116 1,50	H1	446565 1116 10,75
E2	446560 1116 244,-	F2	446562 2225 4,80	G2	446563 2225 1,86	H2	446565 2225 11,10
E3	446560 2225 370,-	F3	446562 3332 5,05	G3	446563 3332 1,86	H3	446565 3332 14,40
E4	446560 3332 539,-	F4	446562 4440 6,45	G4	446563 4440 3,92	H4	446565 4440 26,10
E5	446560 4440 969,-						
4137		4137		4137		4137	



Continued on next page >>>

**Quick-release boring bar holder, type BS**

- With cylindrical bore for Morse taper sleeves and for direct attachment of boring bars
- Supplied with lockable height-adjustment screw and clamping screws
- Tool holder blanks available on request

suitable for holder size	for boring bar Ø mm	Total length mm							art.no.	€
AA	15	50	A1	B1	C1	D1	E1	F1	<b>446520 0015</b>	<b>106,50</b>
A	30	80	A2	B2	C2	D2	E2	F2	446520 1130	<b>127,50</b>
B	40	120	A3	B3	C3	D3	E3	F3	446520 2240	<b>192,50</b>
C	40	160	A4	B4	C4	D4	E4	F4	446520 3340	<b>321,-</b>
C	50	160	A4	B4	C4	D4	E4	F4	446520 3350	<b>326,-</b>
D1	63	180	A5	B5	C5	D5	E5	F5	446520 4463	<b>669,-</b>

4137

**Boring bar**

- For quick-release holders with straight bores
- Lateral slot, one side straight and one side inclined

suitable for holder size	Ø mm	for quadratic mm	Total length mm	art.no.	€
A	30	12x12	250	<b>446545 1112</b>	<b>60,10</b>
B	40	12x12	500	446545 2212	<b>77,30</b>
C	40	12x12	500	446545 3312	<b>77,30</b>
C	50	20x20	500	446545 3320	<b>139,50</b>
D1	63	20x20	600	446545 4420	<b>219,-</b>

4137

**Morse taper sleeve, type H**







- With jacking screw
- For mounting in BS quick-release boring bar holders, straight outer diameter
- For tools with a Morse taper shank

suitable for holder size	Shank Ø mm	Shank design interior	art.no.	€
A	30	MT 1	<b>446525 1101</b>	<b>44,40</b>
A	30	MT 2	446525 1102	<b>47,10</b>
B	40	MT3	446525 2203	<b>57,50</b>
B	40	MT 4	446525 2204	<b>64,60</b>
C	40	MT3	446525 3303	<b>57,50</b>
C	40	MT 4	446525 3304	<b>64,60</b>
C	50	MT3	446525 3313	<b>72,80</b>
C	50	MT 4	446525 3314	<b>77,30</b>
C	50	MT 5	446525 3315	<b>104,50</b>
D1	63	MT 5	446525 4405	<b>151,50</b>

4137

**Quick-release boring tool holder type B**

- With V-block
- For boring bars and other straight shank tools
- Supplied with lockable height-adjustment screw and clamping screws

suitable for holder size	for boring bar Ø mm	Total length mm	suitable quadratic-head bolt							art.no.	€
AA	12	50	M5 x 0.8 x 18	A1	B1	C1	D1	E1	F1	<b>446510 0012</b>	<b>92,60</b>
A	20	85	M7 x 1 x 23	A2	B2	C2	D2	E2	F2	446510 1120	<b>91,10</b>
B	32	130	M11 x 1 x 30	A3	B3	C3	D3	E3	F3	446510 2230	<b>152,-</b>
C	40	160	M14 x 1.5 x 40	A4	B4	C4	D4	E4	F4	446510 3340	<b>261,-</b>
C	50	160	M14 x 1.5 x 40	A4	B4	C4	D4	E4	F4	446510 3350	<b>277,-</b>
D1	63	180	M14 x 1.5 x 40	A5	B5	C5	D5	E5	F5	446510 4463	<b>579,-</b>

4137

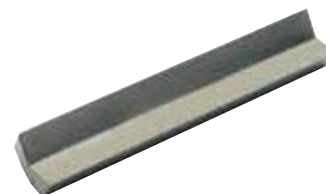


**Insert V-blocks, type P**

- For holding small boring bars and boring tools in quick-release boring tool holder B

suitable for holder size	Total length mm	max. Ø mm	art.no.	€
A	85	14	<b>446515 1114</b>	<b>20,80</b>
B	130	20	446515 2220	21,40
C	160	25	446515 3325	38,40
C	160	32	446515 3332	46,40
D1	180	40	446515 4440	84,50

4137

**Quick-release lathe tool holder, type D**

- Flat tool support
- Supplied with lockable height-adjustment screw and clamping screws

suitable for holder size	D mm	Total length mm	suitable quadratic-head bolt							art.no.	€
AA	12	50	M5 x 0.8 x 18	A1	B1	C1	D1	E1	F1	<b>446505 0012</b>	<b>87,-</b>
A	16	75	M7 x 1 x 23	A2	B2	C2	D2	E2	F2	446505 1116	87,-
A	16	90	M7 x 1 x 23	A2	B2	C2	D2	E2	F2	446505 1117	87,-
A	20	75	M7 x 1 x 23	A2	B2	C2	D2	E2	F2	446505 1120	88,50
A	20	90	M7 x 1 x 23	A2	B2	C2	D2	E2	F2	446505 1121	88,50
B	25	120	M11 x 1 x 30	A3	B3	C3	D3	E3	F3	446505 2225	137,-
B	25	140	M11 x 1 x 30	A3	B3	C3	D3	E3	F3	446505 2226	137,-
B	32	120	M11 x 1 x 30	A3	B3	C3	D3	E3	F3	446505 2232	139,-
B	32	140	M11 x 1 x 30	A3	B3	C3	D3	E3	F3	446505 2233	139,-
C	32	150	M14 x 1.5 x 40	A4	B4	C4	D4	E4	F4	446505 3332	215,-
C	32	170	M14 x 1.5 x 40	A4	B4	C4	D4	E4	F4	446505 3333	215,-
C	40	150	M14 x 1.5 x 40	A4	B4	C4	D4	E4	F4	446505 3340	234,-
C	40	170	M14 x 1.5 x 40	A4	B4	C4	D4	E4	F4	446505 3341	234,-
C	45	170	M14 x 1.5 x 40	A4	B4	C4	D4	E4	F4	446505 3345	245,-
D1	40	180	M14 x 1.5 x 40	A5	B5	C5	D5	E5	F5	446505 4440	355,-
D1	50	180	M14 x 1.5 x 40	A5	B5	C5	D5	E5	F5	446505 4450	375,-
D1	63	180	M14 x 1.5 x 40	A5	B5	C5	D5	E5	F5	446505 4463	399,-

4137

**Quick-release parting-off tool holder, type AS**

- For parting-off tool type TS

suitable for holder size	suitable for							art.no.	€
AA	Parting-off tool TS, 2.5 x 10.0	A1	B1	C1	D1	E1	F1	<b>446540 0001</b>	<b>146,50</b>
A	Parting-off tool TS, 2.7 x 10.0	A2	B2	C2	D2	E2	F2	446540 1180	146,50
B	Parting-off tool TS, 4.2 x 15.9	A3	B3	C3	D3	E3	F3	446540 2200	187,50
C	Parting-off tool TS, 5.1 x 18.5	A4	B4	C4	D4	E4	F4	446540 3300	224,-

4137

**Spare parts**

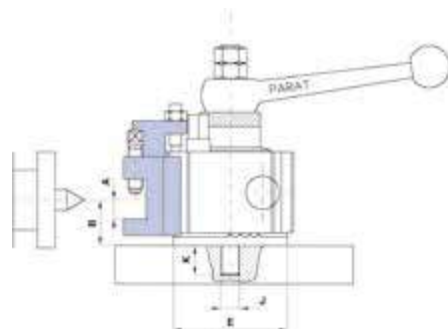
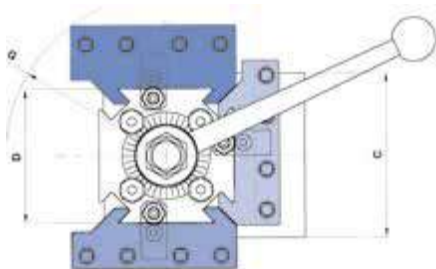
	Square pin key		Console with screws and nuts		Square-head screw		Height-adjustment screw		Height adjustment nut		Attachment screw for console						
	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€					
A1	446554 0012	24,10	B1	446555 0012	35,70	C1	446557 0012	3,76	D1	446558 0012	6,05	E1	446559 0012	4,38	F1	446561 0012	5,85
A2	446554 1116	28,-	B2	446555 1116	32,40	C2	446557 1116	3,76	D2	446558 1116	3,01	E2	446559 1116	3,46	F2	446561 1116	1,18
A3	446554 2225	37,90	B3	446555 2225	41,80	C3	446557 2225	4,99	D3	446558 2225	3,76	E3	446559 2225	3,76	F3	446561 2225	1,86
A4	446554 3332	55,50	B4	446555 3332	49,20	C4	446557 3332	6,95	D4	446558 3332	6,95	E4	446559 3332	5,90	F4	446561 3332	1,95
A5	446554 4440	55,50	B5	446555 4440	88,-	C5	446557 4440	6,85	D5	446558 4440	9,90	E5	446559 4440	10,90	F5	446561 4440	5,85
	4137		4137		4137		4137		4137		4137		4137				



## PARAT Quick-change tool holder

- For lathes
- Precise manufacture due to high precision and indexing accuracy (0.005 mm)
- Various production options (40 tool positions, 9° spacing possible)
- Quick height adjustment via adjusting screw
- Extremely flexible due to modular design
- Selecting the correct revolver head depends on the following parameters:  
lathe drive power, tool slide width C, turning tool height A

**Assembly service  
on request**



### 4-place revolver head

- Supplied with cranked box spanner and chuck key

Type	A mm	B mm	C mm	D mm	E mm	G mm	J mm	K mm	Drive power max. kW	Weight per unit kg	art.no.	€
RD1	20	30	90 - 100	84	80	180	M14 x 2	21	6	3	<b>446601 0101</b>	<b>1.489,-</b>
RD2	25	40	110 - 150	106	102	240	M16 x 2	25	15	6.5	446601 0201	<b>1.899,-</b>
RD3	40	60	150 - 180	134	133	300	M20 x 2.5	30	25	14	446601 0301	<b>2.749,-</b>
RD4	50	80	200 - 250	154	150	350	M24 x 3	35	45	21	446601 0401	<b>3.599,-</b>

4136

### 4-place revolver head with internal cooling

- Supplied with cranked box spanner, socket spanner, chuck key, clamping screw with internal bore, cooling hose, connecting piece, winding piece, locking screw

Type	A mm	B mm	C mm	D mm	E mm	G mm	J mm	K mm	Drive power max. kW	Weight per unit kg	art.no.	€
RD1+IC	20	30	90 - 100	84	80	180	M14 x 2	21	6	3	<b>446601 0102</b>	<b>1.709,-</b>
RD2+IC	25	40	110 - 150	106	102	240	M16 x 2	25	15	6.5	446601 0202	<b>2.099,-</b>
RD3+IC	40	60	150 - 180	134	133	300	M20 x 2.5	30	25	14	446601 0302	<b>2.839,-</b>
RD4+IC	50	80	200 - 250	154	150	350	M24 x 3	35	45	21	446601 0402	<b>3.769,-</b>

4136



### Quick-release holder, type WD

- Internal and external machining

Type	suitable for	N mm	O mm	P mm	R mm	S mm	U mm	Weight kg	art.no.	€
WD 1/12	RD1/RD1+IK/UD1	84	24	47	14	22	-	0.7	<b>446605 0112</b>	<b>131,50</b>
WD 1/20	RD1/RD1+IK/UD1	84	33	52	20	22	-	0.8	446605 0120	<b>154,50</b>
WD 2/25	RD2/RD2+IK/UD2	110	36	66	19	33	-	1.9	446605 0225	<b>199,-</b>
WD 3/32	RD3/RD3+IK/UD3	140	44	76	25	33	-	3	446605 0332	<b>311,-</b>
WD 3/40	RD3/RD3+IK/UD3	140	44	76	25	33	-	3.1	446605 0340	<b>311,-</b>
WD 4/40	RD4/RD4+IC	160	53	96	30	44	-	5	446605 0440	<b>475,-</b>
WD 4/50	RD4/RD4+IC	160	63	96	40	54	-	5.5	446605 0450	<b>475,-</b>

4136





### Quick-release holder, type WDL

- Internal machining

Type	suitable for	N mm	O mm	P mm	R mm	S mm	U mm	Weight kg	art.no.	€
WDL 1/12	RD1/RD1+IK/UD1	100	24	47	14	22	16	0.8	<b>446635 0112</b>	141,-
WDL 1/20	RD1/RD1+IK/UD1	100	33	52	20	22	16	0.9	446635 0120	165,50
WDL 2/25	RD2/RD2+IK/UD2	130	36	66	19	33	20	2.1	446635 0225	209,-
WDL 3/32	RD3/RD3+IK/UD3	165	44	76	25	33	25	3.4	446635 0332	322,-
WDL 3/40	RD3/RD3+IK/UD3	165	44	76	25	43	25	3.4	446635 0340	322,-
WDL 4/40	RD4/RD4+IC	190	53	96	30	44	30	5.8	446635 0440	529,-
WDL 4/50	RD4/RD4+IC	190	63	96	40	54	30	6	446635 0450	529,-

4136



### Quick-release holder, type WDPL

- For boring bars

Type	suitable for	N mm	O mm	P mm	R mm	S mm	U mm	Weight kg	art.no.	€
WDPL 1/12	RD1/RD1+IK/UD1	100	289	47	16	22	16	0.9	<b>446610 0112</b>	155,-
WDPL 2/25	RD2/RD2+IK/UD2	130	50	62	31	33	20	2.3	446610 0225	255,-
WDPL 3/32	RD3/RD3+IK/UD3	165	53	66	31	33	25	3.6	446610 0332	370,-
WDPL 4/40	RD4/RD4+IC	190	63	96	40	52	30	6.5	446610 0440	679,-

4136



### Quick-release holder, type WB

- For clamping sleeves

Type	suitable for	N mm	O mm	P mm	R mm	S mm	U mm	Weight kg	art.no.	€
WB 1/30	RD1/RD1+IK/UD1	84	39	47	30	-	-	0.8	<b>446620 0130</b>	154,50
WB 2/40	RD2/RD2+IK/UD2	110	51	62	40	-	-	1.8	446620 0240	255,-
WB 3/40	RD3/RD3+IK/UD3	140	53	66	40	-	-	2.7	446620 0340	365,-
WB 3/50	RD3/RD3+IK/UD3	140	63	76	50	-	-	3.5	446620 0350	399,-
WB 4/60	RD4/RD4+IC	160	77	96	60	-	-	6	446620 0460	679,-

4136



### Clamping sleeves, Morse taper

suitable for	External Ø mm	Shank design interior	art.no.	€
WB 1/30	30	MT 1	<b>446625 0101</b>	96,70
WB 1/30	30	MT 2	446625 0102	107,50
WB 2/40, WB 3/40	40	MT3	446625 0203	124,-
WB 2/40, WB 3/40	40	MT 4	446625 0204	127,50
WB 3/50	50	MT3	446625 0303	137,-
WB 3/50	50	MT 4	446625 0304	146,-
WB 4/60	60	MT 4	446625 0404	203,-
WB 4/60	60	MT 5	446625 0405	212,-

4136



Continued on next page &gt;&gt;&gt;

## Clamping sleeves, straight, slotted

suitable for	External Ø mm	Interior Ø mm	art.no.	€
WB 1/30	30	8	<b>446626 0108</b>	<b>57,-</b>
WB 1/30	30	10	446626 0110	57,-
WB 1/30	30	12	446626 0112	57,-
WB 1/30	30	15	446626 0115	57,-
WB 1/30	30	16	446626 0116	57,-
WB 1/30	30	20	446626 0120	57,-
WB 1/30	30	25	446626 0125	57,-
WB 2/40, WB 3/40	40	10	446626 0210	61,30
WB 2/40, WB 3/40	40	12	446626 0212	61,30
WB 2/40, WB 3/40	40	15	446626 0215	61,30
WB 2/40, WB 3/40	40	16	446626 0216	61,30

4136

suitable for	External Ø mm	Interior Ø mm	art.no.	€
WB 2/40, WB 3/40	40	20	446626 0220	61,30
WB 2/40, WB 3/40	40	25	446626 0225	61,30
WB 2/40, WB 3/40	40	32	446626 0232	61,30
WB 3/50	50	20	446626 0320	81,80
WB 3/50	50	25	446626 0325	81,80
WB 3/50	50	32	446626 0332	81,80
WB 3/50	50	40	446626 0340	81,80
WB 4/60	60	25	446626 0425	104,50
WB 4/60	60	32	446626 0432	104,50
WB 4/60	60	40	446626 0440	104,50

4136



## Quick-release holder, type WDR

- External machining

Type	suitable for	N mm	O mm	P mm	R mm	S mm	U mm	Weight kg	art.no.	€
WDR 1/12	RD1/RD1+IK/UD1	100	24	47	14	22	16	0.8	<b>446630 0112</b>	<b>141,-</b>
WDR 1/20	RD1/RD1+IK/UD1	100	33	52	20	22	16	0.9	446630 0120	165,50
WDR 2/25	RD2/RD2+IK/UD2	130	36	66	19	33	20	2.1	446630 0225	209,-
WDR 3/32	RD3/RD3+IK/UD3	165	44	76	25	33	25	3.4	446630 0332	322,-
WDR 3/40	RD3/RD3+IK/UD3	165	44	76	25	43	25	3.4	446630 0340	322,-
WDR 4/40	RD4/RD4+IC	190	53	96	30	44	30	5.8	446630 0440	529,-
WDR 4/50	RD4/RD4+IC	190	63	96	40	54	30	6	446630 0450	529,-

4136



## Quick-release holder, type WBW

- Blank

Type	suitable for	N mm	O mm	P mm	Weight kg	art.no.	€
WBW 1/30	RD1/RD1+IK/UD1	84	39	47	1.4	<b>446650 0130</b>	<b>130,-</b>
WBW 2/40	RD2/RD2+IK/UD2	110	51	62	3.2	446650 0240	206,-
WBW 3/40	RD3/RD3+IK/UD3	140	53	66	4.3	446650 0340	306,-
WBW 3/50	RD3/RD3+IK/UD3	140	63	76	5.7	446650 0350	334,-
WBW 4/60	RD4/RD4+IC	160	77	96	10	446650 0460	589,-

4136



## Over 200,000 tools available online!

## Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

# www.saratools.com

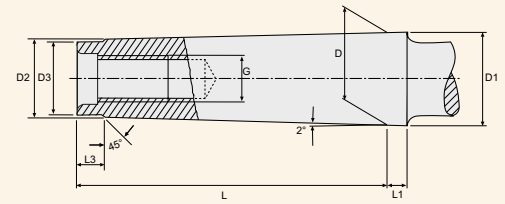
## Shank designs

For milling machines and machining centres

### Morse taper

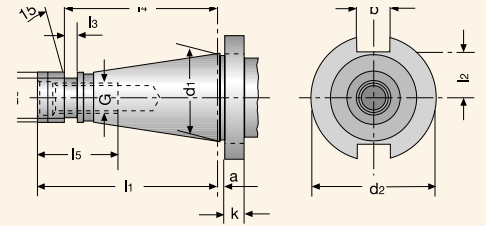
#### DIN 228 shape A (conical shank with clamping thread)

MK	D	D1	D2	D3	L	L1	L3	G
0	9,045	9,2	6,4	6,0	50,0	3,0	4	-
1	12,065	12,2	9,4	9,0	53,5	3,5	5	M 6
2	17,780	18,0	14,6	14,0	64,0	5,0	5	M10
3	23,825	24,1	19,8	19,0	81,0	5,0	7	M12
4	31,267	31,6	25,9	25,0	102,5	6,5	9	M16
5	44,399	44,7	37,6	35,7	129,5	6,5	10	M20
6	63,348	63,8	53,9	51,0	182,0	8,0	16	M24



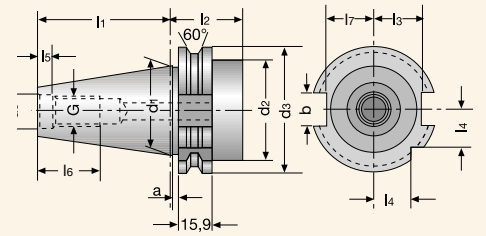
### Steep taper shanks, DIN 2080 part 1 shape A

SK	d1	a	b	k	G	d2	d3	d4	l1	l2	l3	l4	l5
30	31,75	1,6	16,1	8	M12	50	-	17,2	68,4	16,2	-	-	24
40	44,45	1,6	16,1	10	M16	63	21,1	25	93,4	22,5	7	82	32
50	69,85	3,2	25,7	12	M24	97,5	-	39,2	126,8	35,3	-	-	47



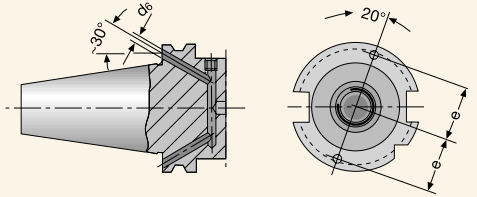
### Steep-taper shanks DIN ISO 7388-1 / DIN 69871 part 1 shape A or shape AD with internal coolant supply

SK	G	d1	d2max	d3	d5	l1	l2	l3	l4	l5	l6	l7	a
30	M12	31,75	45	50,00	13	47,80	35	19,0	15,0	5,5	24	16,4	3,2
40	M16	44,45	50	63,55	17	68,40	35	25,0	18,5	8,2	32	22,8	3,2
50	M24	69,85	80	97,50	25	101,75	35	37,7	30,0	11,5	47	35,5	3,2



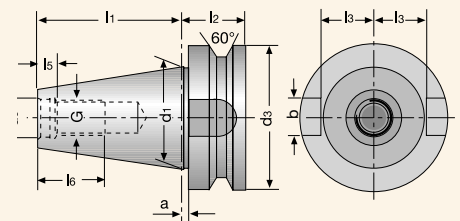
### Steep-taper shanks DIN ISO 7388-1 / DIN 69871 part 1 shape B, with coolant supply via the collar

SK	G	d1	d2max	d3	d5	d6	l1	l2	l3	l4	l5	l6	l7	a	e	b
30	M12	31,75	45	50,00	13	4	47,80	35	19,0	15,0	5,5	24	16,4	3,2	21	16,1
40	M16	44,45	50	63,55	17	4	68,40	35	25,0	18,5	8,2	32	22,8	3,2	27	16,1
50	M24	69,85	80	97,50	25	6	101,75	35	37,7	30,0	11,5	47	35,5	3,2	42	25,7



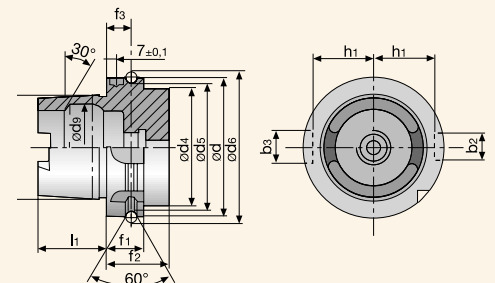
### Steep-taper shanks DIN ISO 7388-2 J / MAS 403 BT

SK	G	d1	d3	d5	l1	l2	l3	l5	l6	a	b
30	M12	31,75	46	12,5	48,4	22	16,3	7,0	24	2	16,1
40	M16	44,45	63	17,0	65,4	27	22,5	8,2	32	2	16,1
50	M24	69,85	100	25,0	101,8	38	35,3	11,0	47	3	25,7



### Hollow taper shank DIN 69893 shape A (HSK-A) with internal coolant supply

HSK	b2	b3	d2	d4	d5	d6	d9	f1	f2	f3	l1	h1
40	9	11	30	34	43	45	25,5	20	35	16	20	17
50	12	14	38	42	43	59,3	32	26	42	18	25	21
63	16	18	48	53	55	72,3	40	26	42	18	32	26,5



### The different forms of hollow-taper shanks DIN 69893 (HSK)

#### Shape A - Automatic tool switching

- Central coolant supply
- **Additional T**, a slot in the taper is a tighter fit

#### Shape B - As shape A, but with enlarged collar

#### Shape C - Central coolant supply

- without gripper groove

#### Shape D - As shape C, but with additional coolant supply via the collar

#### Shape E - For HSC machining



























- Central coolant supply
- without carrier grooves, with gripper groove

#### Shape F - As shape E, but with enlarged collar

Depending on the design type, a coolant transfer pipe may be required for some machines with an HSK holding fixture. Please observe the machine manufacturer's information.

## Overview of tool holding fixtures

Holding fixtures		 DIN 69893 A HSK-A	 DIN ISO 7388-1 DIN 69871	 DIN 7388-2 J MAS-BT	 DIN 2080	 Str. shank
	Drill chuck holding fixtures		<b>436103....</b> 1173	<b>436107....</b> 1173	<b>436101....</b> 1173	<b>400185....</b> 1174
	NC short drill chuck with worm gear ATORN	<b>440129....</b> 1175	<b>440127....</b> 1175	<b>440128....</b> 1175		
	NC short drill chuck with spur gear system ATORN	<b>440137....</b> 1175	<b>440139....</b> 1175	<b>440136....</b> 1175		
	NC short drill chuck with spur gear system SARA		<b>440243....</b> 1176	<b>440241....</b> 1176	<b>440242....</b> 1176	
	NC short drill chuck with spur gear system WTE		<b>441005....</b> 1176	<b>441007....</b> 1176	<b>441001....</b> 1176	
	ATORN micro universal chuck					<b>442401....</b> 1177
	ATORN precision ER collet chuck	<b>431236....</b> 1178	<b>431235....</b> 1178			
	CENTRO-P precision ER collet chuck	<b>431232....</b> 1179	<b>431230....</b> 1179			
	Micro precision chuck AMC	<b>441140....</b> 1181	<b>442140....</b> 1181	<b>443140....</b> 1181		
	Power chuck UltraGrip	<b>440302....</b> 1182	<b>440300....</b> 1182	<b>440301....</b> 1182		
	Power chuck UltraJet	<b>440202....</b> 1183	<b>440200....</b> 1183	<b>440201....</b> 1183		
	HG high-precision chuck	<b>431219....</b> 1185	<b>431213....</b> 1185			
	Hydraulic expansion chuck HYDRO-Grip HD	<b>433826....</b> 1186	<b>433806....</b> 1186	<b>433816....</b> 1186		
	ATORN hydraulic expansion chuck		<b>433311....</b> 1187			
	ATORN high-speed hydraulic expansion chuck	<b>433409....</b> 1187	<b>433411....</b> 1187			
	Hydraulic expansion chuck HG PENCIL	<b>433801....</b> 1188	<b>433802....</b> 1188	<b>433803....</b> 1189		<b>433811....</b> 1189
	Ultra-slim hydraulic expansion chuck	<b>433341....</b> 1190	<b>433340....</b> 1190	<b>433342....</b> 1190		
	Transverse slot shell-type milling cutter arbour with planar support		<b>435403....</b> 1191	<b>435407....</b> 1191		
	ER collet chuck with planar support		<b>431203....</b> 1192	<b>431107....</b> 1192		
	Milling cutter mount DIN6359 (Weldon) with planar support		<b>434603....</b> 1193	<b>434607....</b> 1193		

Holding fixtures	 DIN 69893 A HSK-A	 DIN ISO 7388-1 DIN 69871	 DIN 7388-2 J MAS-BT	 DIN 2080	 Str. shank
 OZ collet chuck	<b>431509....</b> 1194	<b>431503....</b> 1194	<b>431507....</b> 1194	<b>431501....</b> 1194	
 ER collet chuck	<b>431009....</b> 1196	<b>431003....</b> 1196	<b>431007....</b> 1197	<b>431001....</b> 1197	<b>431016....</b> 1197
 ER collet chuck extension					<b>432000....</b> 1203
 DIN 6359 (WELDON) milling cutter holding fixture	<b>434509....</b> 1207	<b>434503....</b> 1208	<b>434507....</b> 1209	<b>434501....</b> 1210	
 Transverse slot shell-type milling cutter arbour	<b>435309....</b> 1211	<b>435303....</b> 1211	<b>435307....</b> 1212	<b>435301....</b> 1212	
 Transverse slot shell-type milling arbour, vibration-dampened	<b>435339....</b> 1213	<b>435333....</b> 1213	<b>435337....</b> 1214		
 Combination shell-type milling cutter arbour	<b>434909....</b> 1215	<b>434903....</b> 1215	<b>434907....</b> 1216	<b>434901....</b> 1216	
 Boring bar blanks		<b>431002....</b> 1219		<b>431000....</b> 1219	
 Adapter sleeves for MT with tangs	<b>433509....</b> 1219	<b>433503....</b> 1220	<b>433507....</b> 1220	<b>433501....</b> 1220	
 Adapter sleeves for steep-angle tapers		<b>433903....</b> 1222	<b>433907....</b> 1222	<b>433901....</b> 1222	
 Adapter sleeves for MT with clamping threads		<b>433703....</b> 1222	<b>433707....</b> 1223		
 Tool holding fixtures for indexable insert drills		<b>434540....</b> 1223			
 Tool holding fixtures for screw-in milling cutters	<b>430236....</b> 1223	<b>430235....</b> 1224			
 Extension for modular milling cutter heads					<b>430352....</b> 1224
 ThermoGrip shrink fit holders	<b>430218....</b> 1229	<b>430216....</b> 1229			
 ThermoGrip JetSleeve2® shrink fit holders	<b>430331....</b> 1230	<b>430330....</b> 1230			
 Shrink-fit extensions					<b>430228....</b> 1231
 ATORN shrink fit holding fixtures 3°	<b>440431....</b> 1232	<b>440430....</b> 1233			
 ATORN shrink fit holding fixtures for heavy-duty machining 4,5°	<b>440231....</b> 1234	<b>440230....</b> 1235			
 Thread cutting quick-change chuck		<b>442003....</b> 1238	<b>442007....</b> 1238	<b>442001....</b> 1238	<b>442008....</b> 1238
 Thread cutting synchronised chuck ATORN	<b>442021....</b> 1240	<b>442020....</b> 1240			<b>442022....</b> 1240





## SARA® Assembly system

- Aluminium housing
- 4 x 90° swivel-mounted
- Steel modular tool holders
- Quick and easy replacement of holding fixtures
- High flexibility
- Positive-locking fixing of the tools
- No damage to cone tip
- **Interchangeable adapter for polygon shank according to DIN 26623-1 also available**

### Assembly system

Designation	art.no.	€
Basic unit, 4 x 90° swivel-mounted for interchangeable adapter	<b>438180 0001</b>	<b>183,50</b>
	4136	



438180 0001

### Interchangeable adapter

- For DIN 69893 Form A (HSK-A)

Designation	art.no.	€
Tool holder HSK 40	<b>438382 0040</b>	<b>178,-</b>
Tool holder HSK 50	438382 0050	178,-
Tool holder HSK 63	438382 0063	178,-
Tool holder HSK 80	438382 0080	229,-
Tool holder HSK 100	438382 0100	229,-
	4136	



### Interchangeable adapter

- For DIN ISO 7388-1 (DIN 69871) / 7388-2 (JIS B) and DIN 2080

Designation	art.no.	€
Tool holder SK 30	<b>438181 0030</b>	<b>181,50</b>
Tool holder SK 40	438181 0040	181,50
Tool holder SK 50	438181 0050	213,-
	4136	



### Interchangeable adapter

- For DIN 69880 (VDI)

Designation	art.no.	€
Tool holder VDI 20	<b>438383 0020</b>	<b>181,50</b>
Tool holder VDI 30	438383 0030	181,50
Tool holder VDI 40	438383 0040	213,-
Tool holder VDI 50	438383 0050	213,-
	4136	

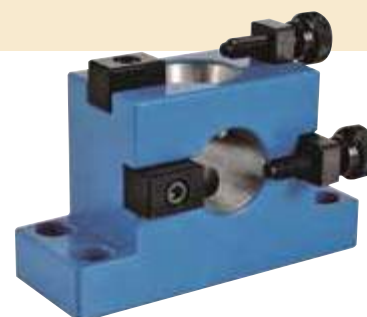


## Aluminium assembly aid

### Can be used horizontally and vertically

- With steep-angle taper holder
- Aluminium assembly block
- Secured against falling out

Shank	L mm	B mm	H mm	art.no.	€
SK 30	127	47	75	<b>438049 0030</b>	<b>137,50</b>
SK 40	160	62	105	438049 0040	137,50
SK 50	180	99	155	438049 0050	214,-
				4117	





## Steel assembly aid, swivel-mounted

Can be used horizontally and vertically, swivel-mounted

- Steel housing
- Support bracket rotatable through two directions at 45° intervals
- Secured against falling out
- Attachment holes in the base plate

also for HSK and VDI



Shank	L mm	B mm	H mm	art.no.	€
SK 30	125	64	121	438051 0030	202,-
SK 40	130	64	136	438051 0040	202,-
SK 50	170	72	170	438051 0050	239,-
VDI 20	100	48	97	438051 0120	234,-
VDI 30	130	64	121	438051 0130	234,-
VDI 40	130	64	136	438051 0140	234,-
VDI 50	170	72	170	438051 0150	260,-
HSK 40	100	48	97	438051 0240	234,-
HSK 63	130	64	136	438051 0263	260,-
HSK 100	170	72	170	438051 0210	265,-

4117

## SARA® CNC foam stand for tool holders

- For careful, space-saving storage and arrangement of tool holders
- Made from EPP (expanded polypropylene) particle foam
- Oil, acid and coolant resistant, shock and fracture-proof
- Low unladen weight, easy to clean
- Holders can easily be cut to size and customised with a band saw
- Holders can be joined together easily and securely with a glue gun
- Supplied without tools



### Foam tool holder stand

Holding fixtures	Number of holding fixtures	Width mm	Depth mm	Height mm	Weight kg	art.no.	€
SK 40	6	595	90	100	0.226	800411 0001	18,-
SK 40	12	360	250	200	0.473	800411 0002	50,80
SK 50	6	390	260	145	0.537	800411 0003	56,50
HSK 63	10	360	180	60	0.178	800411 0004	51,40
HSK 63	15	360	245	150	0.356	800411 0005	55,-

8101



Non-rebound ...

... it's the tool.

**ATORN®**  
Performance demands quality

## bedrunka+hirth CNC stand for tool holders

- For storing and arranging tool holders
- Can be flexibly equipped with various inserts (805030....)
- **Unless otherwise instructed, we supply the colour RAL 7035 (light grey)**
- **Two-colour CNC stands can also be ordered (see illustration)**
- **The standard colours shown below are available at no extra cost**
- **Supplied without inserts and tools**

### Tool holder stand

- Our modular system offers you a wide range of options
- 1 box with screw-fixed sides, including handles
- Without tools or inserts

Number inserts	Width mm	Depth mm	Height mm	Model	art.no.	€
7x E1, 5x E2, 3x E3	470	120	180	WAT 500	<b>800406 0001</b>	<b>73,10</b>
10x E1, 7x E2, 5x E3	620	120	180	WAT 600	800406 0002	<b>77,40</b>
14x E1, 9x E2, 7x E3	820	120	180	WAT 800	800406 0005	<b>82,90</b>
16x E1, 11x E2, 8x E3	920	120	180	WAT 900	800406 0006	<b>86,20</b>

8101

### Table-top stand for tool holders

- 2 or 4 holders with screw-fixed body
- Shelf and handle
- Without tools or inserts

Number inserts	Width mm	Depth mm	Height mm	Model	art.no.	€
14x E1, 10x E2, 6x E3	425	375	300	TAG 2-1	<b>800406 0010</b>	<b>171,50</b>
20x E1, 14x E2, 10x E3	575	375	300	TAG 2-2	800406 0030	<b>178,-</b>
28x E1, 20x E2, 12x E3	425	375	525	TAG 4-1	800406 0011	<b>250,-</b>
40x E1, 28x E2, 20x E3	575	375	525	TAG 4-2	800406 0031	<b>262,-</b>

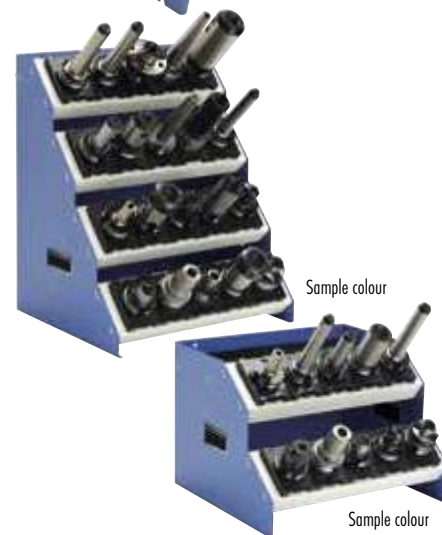
8101

RAL 6011	RAL 7035	RAL 7040	RAL 7016	RAL 9005	RAL 1023	RAL 3003	RAL 3020	RAL 5012	RAL 5013	RAL 5010
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------



Sample colour

Sample colour



Sample colour

Sample colour

## bedrunka+hirth Tool inserts

- The insert is clipped into the system by means of a snap-fit closure (clip), and its spacing can easily be changed in increments of 25 mm at any time, without tools
- **Made from oil-resistant, shock-proof and fracture-proof ABS plastic**
- **Compatible with all Bedrunka+Hirth CNC storage and transport systems**
- Protective mounting and centring of tool holders
- Optimum use of space thanks to individually adjustable plastic inserts
- Functional modular system
- Knobs prevent tool holders from "adhering" to the surface of the inserts
- All tool sizes can be combined

### Tool inserts

- made of shock-proof, oil-resistant ABS material

for tool holder	Type	Width mm	Depth mm	art.no.	€
SK 30	E1	49	103	<b>805030 0030</b>	<b>5,70</b>
SK 40	E2	74	103	805030 0040	<b>6,25</b>
SK 50	E3	99	103	805030 0050	<b>6,90</b>
VDI 30	E1	49	103	805030 1030	<b>5,70</b>
VDI 40	E2	74	103	805030 1040	<b>6,25</b>
VDI 50	E3	99	103	805030 1050	<b>6,90</b>
MT3	E1	49	103	805030 2003	<b>5,70</b>
MT 4	E1	49	103	805030 2004	<b>5,70</b>
MT 5	E2	74	103	805030 2005	<b>6,25</b>
HSK A32/B40 (3 bores)	E3	99	103	805030 3032	<b>13,55</b>
HSK A40/B50 (2 bores)	E3	99	103	805030 3040	<b>11,15</b>
HSK A50/B63	E2	74	103	805030 3050	<b>8,50</b>
HSK A63/B80	E2	74	103	805030 3063	<b>9,20</b>
HSK A80/B100	E3	99	103	805030 3080	<b>9,85</b>
HSK A100/B125	E3	99	103	805030 3100	<b>10,40</b>
CAPTO C3 (3 bores)	E3	99	103	805030 5030	<b>13,55</b>
CAPTO C4	E1	49	103	805030 5040	<b>5,70</b>
CAPTO C5	E2	74	103	805030 5050	<b>6,80</b>
CAPTO C6	E3	99	103	805030 5060	<b>7,65</b>
CAPTO C8	E3	99	103	805030 5080	<b>9,85</b>
Universal inserts, solid material Ø 80 mm	E3	99	103	805030 4000	<b>9,85</b>

8101



805030 0040

805030 3032

805030 3040

805030 4000

805030 5030

## Data holders

- Clear marking of tool holders
- Tidy-looking tool storage
- Made of plastic
- Minimised tooling time
- Tool optimisation through different colours



**Systematic labelling**

### for SK40 / HSK63

Colour	art.no.	€
Blue	<b>438061</b> 0002	<b>4,02</b>
Brown	438061 0005	4,02
Yellow	438061 0004	4,02
Grey	438061 0006	4,02
Green	438061 0003	4,02
Red	438061 0001	4,02
4121		



### for SK50 / HSK100

Colour	art.no.	€
Blue	<b>438062</b> 0002	<b>4,89</b>
Brown	438062 0005	4,89
Yellow	438062 0004	4,89
Grey	438062 0006	4,89
Green	438062 0003	4,89
Red	438062 0001	4,89
4121		



## Taper wiper

- SK and MT wipers with robust wooden body and felt strips
- HSK wipers with robust plastic body and felt strips
- For cleaning the internal taper on machines and sleeves
- Felt strips resistant to oil and emulsions
- High absorption capacity
- Long service life



### Hollow taper wiper

for taper support	Total length mm	art.no.	€
HSK 100	199	<b>400560</b> 1100	<b>75,30</b>
HSK 32	138	400560 1032	52,40
HSK 40	142	400560 1040	54,-
HSK 50	152	400560 1050	56,-
HSK 63	168	400560 1063	59,50
4109			

### Steep-angle taper wiper

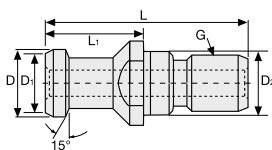
for taper support	Total length mm	art.no.	€
SK 30	168	<b>400560</b> 0030	<b>13,40</b>
SK 40	188	400560 0040	16,50
SK 50	240	400560 0050	29,-
4109			

### Morse taper wiper

for taper support	Total length mm	art.no.	€
MT 1	157	<b>400560</b> 0001	<b>8,75</b>
MT 2	192	400560 0002	11,10
MT3	196	400560 0003	13,80
MT 4	222	400560 0004	17,10
MT 5	258	400560 0005	24,20
4109			

## ATORN® Pull studs

- For tools with a steep-angle taper in accordance with DIN 69871 and JIS B 6339 (MAS-BT)
- All pull studs made from 16MnCr5, case hardened to HRC 58 ± 2
- Soft thread and bore, burnished and ground
- **Pull studs with O-ring = sealed**
- Other versions available on request (machine model must be specified)



### DIN ISO 7388-3 AD, with bore

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK30	13	9	13	M12	44	24	4	Yes	<b>438501</b> 0030	<b>10,15</b>
SK40	19	14	17	M16	54	26	7	Yes	438501 0040	<b>9,80</b>
SK50	28	21	25	M24	74	34	11.5	Yes	438501 0050	<b>12,15</b>

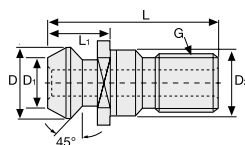
4133



### DIN ISO 7388-3 AF, without bore

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK30	13	9	13	M12	44	24	-	Yes	<b>438502</b> 0030	<b>10,50</b>
SK40	19	14	17	M16	54	26	-	Yes	438502 0040	<b>10,15</b>
SK50	28	21	25	M24	74	34	-	Yes	438502 0050	<b>12,65</b>

4133



### DIN ISO 7388-3 UD, with bore

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK40	18.95	12.95	17	M16	44.5	16.25	7	Yes	<b>438505</b> 0040	<b>10,80</b>
SK50	29.1	19.6	25	M24	65.5	25.55	11.5	Yes	438505 0050	<b>13,75</b>

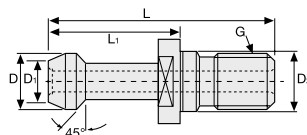
4133



### DIN ISO 7388-3 UF, without bore

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK40	18.95	12.95	17	M16	44.5	16.25	-	Yes	<b>438506</b> 0040	<b>10,-</b>
SK50	29.1	19.6	25	M24	65.5	25.55	-	Yes	438506 0050	<b>13,20</b>

4133



### DIN ISO 7388-3 JD 45°, with bore

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK30	11	7	12.5	M12	43	23	2.7	Yes	<b>438509</b> 4530	<b>9,20</b>
SK40	15	10	17	M16	60	35	4	Yes	438509 4540	<b>10,70</b>
SK50	23	17	25	M24	85	45	6	Yes	438509 4550	<b>15,20</b>

4133

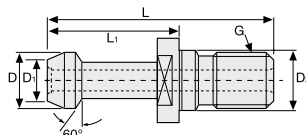


### DIN ISO 7388-3 JF 45°, without bore

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK30	11	7	12.5	M12	43	23	-	No	<b>438510</b> 4530	<b>9,20</b>
SK40	15	10	17	M16	60	35	-	Yes	438510 4540	<b>10,70</b>
SK50	23	17	25	M24	85	45	-	Yes	438510 4550	<b>15,20</b>

4133





**DIN ISO 7388-3 JD 60°, with bore**

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK30	11	7	12.5	M12	43	23	2.7	No	<b>438508 6030</b>	<b>9,20</b>
SK40	15	10	17	M16	60	35	4	Yes	438508 6040	10,70
SK50	23	17	25	M24	85	45	6	Yes	438508 6050	15,20

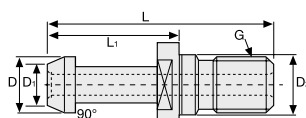
4133



**DIN ISO 7388-3 JF 60°, without bore**

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK30	11	7	12.5	M12	43	23	-	No	<b>438510 6030</b>	<b>9,20</b>
SK40	15	10	17	M16	60	35	-	Yes	438510 6040	10,70
SK50	23	17	25	M24	85	45	-	Yes	438510 6050	15,20

4133



**DIN ISO 7388-3 JD 90°, with bore**

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK40	15	10	17	M16	60	35	4	Yes	<b>438511 9040</b>	<b>10,70</b>
SK50	23	17	25	M24	95	45	6	Yes	438511 9050	15,20

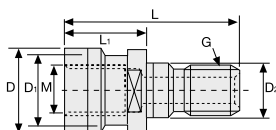
4133



**DIN ISO 7388-3 JF 90°, without bore**

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK40	15	10	17	M16	60	35	4	Yes	<b>438512 9040</b>	<b>10,70</b>
SK50	23	17	25	M24	95	45	6	Yes	438512 9050	15,20

4133



**Ott ring groove, 15° with tapped head, for DIN 69871 AD shank**

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK40	25	21.1	17	M16	53	25.1	M16 / 7.5	Yes	<b>438515 0040</b>	<b>12,15</b>
SK50	39.6	32	25	M24	65.1	25.1	M24 / 11.5	Yes	438515 0050	13,15

4133



**Ott ring groove, 15° with bore, for DIN 69871 AD shank**

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK40	25	21.1	17	M16	53	25.1	7.5	Yes	<b>438516 0040</b>	<b>9,80</b>
SK50	39.6	32	25	M24	65.1	25.1	11.5	Yes	438516 0050	12,25

4133



**Ott ring groove, 15° without bore, for DIN 69871 AD shank**

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK40	25	21.1	17	M16	53	25.1	-	No	<b>438517 0040</b>	<b>9,80</b>
SK50	39.6	32	25	M24	65.1	25.1	-	No	438517 0050	12,25

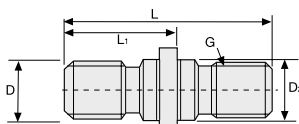
4133



**Saw-tooth thread stud SK40 S20X2 for cover**

suitable for	D mm	D1 mm	D2 mm	Thread	L mm	L1 mm	Bore hole Ø mm	O-ring	art.no.	€
SK40	S20 x 2	-	17	S20x2	56.2	28	-	No	<b>438520 0041</b>	<b>16,10</b>

4133

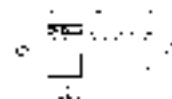


## Coolant transfer pipe

- For optimising the central coolant supply
- For DIN 69893-HSK-A hollow shank tapers, with two mounted sealing rings

Shank	L1 mm	L2 mm	D mm	Thread	art.no.	€
PSC 40	25	12	6	M14 x 1	<b>431011 0004</b>	<b>27,-</b>
PSC 50	28	14	7	M16 x 1.5	431011 0005	27,-
PSC 63	31	15	8	M20 x 2	431011 0006	27,-
PSC 80	31.5	15	10	M20 x 2	431011 0008	27,-
HSK 32	26	5.5	6	M10 x 1	431011 0032	11,40
HSK 80	40	13	14	M20 x 1.5	431011 0080	11,40
HSK 100	44	15.5	16	M24 x 1.5	431011 0100	11,40
HSK 40	29.5	7.5	8	M12 x 1	431011 0040	11,40
HSK 50	33	9.5	10	M16 x 1	431011 0050	11,40
HSK 63	34.5	11.5	12	M18 x 1	431011 0063	11,40

4117



## Coolant transfer pipe key

Shank	L mm	D mm	art.no.	€
HSK 32	115	8.5	<b>431018 0032</b>	<b>25,50</b>
HSK 40	115	10.5	431018 0040	25,50
HSK 50	115	14.5	431018 0050	25,50
HSK 63	136	16.5	431018 0063	22,70
HSK 80	136	18.5	431018 0080	28,80
HSK 100	136	22	431018 0100	29,80

4117



## Socket spanner for pull studs

for DIN ISO 7388-1 and DIN ISO 7388-2

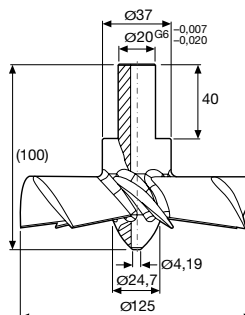
Shank	art.no.	€
SK 40	<b>431028 0040</b>	<b>35,60</b>
SK 50	431028 0050	49,90
BT 40	431028 1040	31,60
BT 50	431028 1050	47,80

4197



## ATORN® Chip booster

- Made from high-strength anodised aluminium
- Automatic cleaning of machine tool working area
- Reduced auxiliary processing times
- Low compressed air consumption
- Central coolant supply
- Balanced to G 2.5 / 12,000 rpm



Ø mm	Shank Ø mm	art.no.	€
125	20	<b>400561 0125</b>	<b>301,-</b>

4144





## SARA® Precision drill chuck Goldstück

- **With clamp force booster**
- Special design for the highest torques (clamp forces)
- The clamp force booster can be used to double the retention force
- With **DIN 238 internal taper**
- **Suitable for clockwise rotation**
- Supplied with chuck key



Clamping range mm	Taper support	L2 mm	L1 mm	D mm	art.no.	€
0 - 13	B 16	92	103	51.5	<b>400101 0013</b>	<b>131,50</b>
3 - 16	B 16	95	108	56	400101 0016	141,50

4108

## RÖHM Quick-release drill chuck SPIRO

- **Precision design**
- Self-clamping without key, self-acting re-tensioning
- Particularly suitable for high speeds and precision work
- **For clockwise rotation**
- **Internal taper, DIN 238**
- True-running accuracy 0.05 mm
- Further sizes available on request



Clamping range mm	Taper support	L1 mm	L2 mm	D mm	art.no.	€
0 - 10	B 12	82.5	90.1	43	<b>400115 0005</b>	<b>163,-</b>
0 - 10	B 16	82.5	90.1	43	400115 0006	163,-
1 - 13	B 16	94	102.5	50	400115 0007	175,-
3 - 16	B 16	96.5	106.8	55	400115 0008	187,50

4186

## RÖHM Keyed drill chuck PRIMA

### Internal taper, DIN 238

- Industrial version with key
- Further sizes available on request

Clamping range mm	Taper support	Wrench size	L1 mm	L2 mm	D mm	art.no.	€
0.5 - 8	B 12	S 1	47.5	57.5	29.5	<b>400125 0001</b>	<b>31,40</b>
1 - 10	B 16	S 2	63	77	42.8	400125 0002	35,-
1 - 16	B 18	S 3	79	98	56.5	400125 0004	82,30
5 - 20	B 22	S 4	92.5	113.5	65	400125 1004	164,-

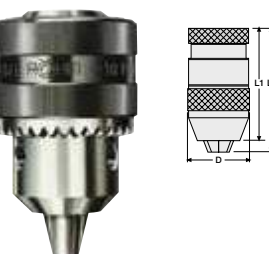
4186

### Spare key

- **DIN 6349**
- For keyed drill chucks

Wrench size	Pin Ø mm	Height mm	art.no.	€
S 1	4	30	<b>400140 0001</b>	<b>2,97</b>
S 2	6	41	400140 0002	2,97
S 3	8	50	400140 0003	4,16
S 4	9	75	400140 0005	5,35

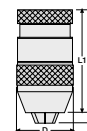
4186





## ROHM Quick-release drill chuck SUPRA

- **Clockwise rotation**
- Without key, self-clamping
- Further sizes and 3/8 inch x 24 female thread available on request



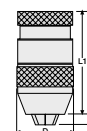
### Internal taper in accordance with DIN 238

Clamping range mm	Taper support	L1 mm	L2 mm	D mm	art.no.	€
0 - 6.5	B 10	59.5	65.6	32	400145 0001	89,50
0 - 8	B 12	67	73.4	35.8	400145 0003	89,30
0 - 10	B 12	79.5	86.1	40.2	400145 0004	96,60
0 - 10	B 16	82.5	89.1	40.2	400145 0005	96,60
1 - 13	B 12	78.8	86.1	40.2	400145 1006	82,30
1 - 13	B 16	93	101.5	46	400145 0006	104,-
3 - 16	B 16	96.5	106.8	51	400145 0007	111,-
3 - 16	B 18	96.5	106.8	51	400145 0008	111,-

4186

## ROHM Quick-release drill chuck SUPRA SK

- **With clamping force locking mechanism**
- Industrial version
- **Clockwise rotation**
- **Female thread**
- Without key, self-clamping
- **Specifically for hammer drills and machines with high natural frequencies**

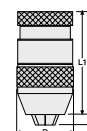


Clamping range mm	Female thread	L1 mm	L2 mm	D mm	art.no.	€
0.5 - 10	3/8" x 24	66	73.7	40	400155 0001	82,30
1.0 - 13	1/2" x 20	74.2	83.3	42.8	400155 0003	89,50

4186

## ALBRECHT Precision drill chuck SBF

- Self-clamping allows for simple and quick operation
- Easy to clamp and open by hand (no key required)
- All wearing parts case-hardened, ground and replaceable
- **For clockwise rotation**
- **Internal taper DIN ISO 239-B**
- Further sizes, versions with fastening screw thread UNF and with diamond-coated clamping jaws available on request



### DIN 239 B..

- \* = DIN 239 B18 with short taper support

Clamping range mm	Taper support	L1 mm	L2 mm	D mm	art.no.	€
0.2 - 1.5	B 06	35	37	19	400105 0000	217,-
0.2 - 3	B 06	44	48	24	400105 0001	181,-
0.5 - 6.5	B 12	62	68	34	400105 0005	176,-
0.5 - 10	B 12	80	92	43	400105 0007	176,50
0.5 - 10	B 16	80	92	43	400105 0008	176,50
1 - 13	B 16	91	103	50	400105 0009	178,-
3 - 16	B 16	96	109	56	400105 0010	203,-
3 - 16	B 18*	96	109	56	400105 0011	203,-

4102

**ALBRECHT** Precision drill chuck SBF-plus  
Präzisions Spannfutter

- **With mounting shank**
- Compact design
- High stability and high true-running accuracy
- **For clockwise rotation**
- **Advantage:** The SBF-plus drill chuck is a total of 21 mm shorter than two-part systems consisting of a taper and drill chuck.
- Version with diamond-coated clamping jaws available on request

**Morse taper holding fixture**

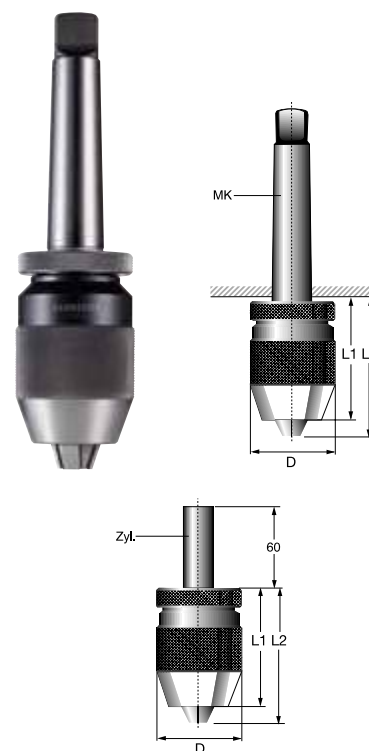
Clamping range mm	Shank	L1 mm	L2 mm	D mm	art.no.	€
1 - 13	MT 2	85	97	50	<b>400156 0213</b>	<b>195,50</b>
1 - 13	MT3	85	97	50	400156 0313	199,-
1 - 13	MT 4	87	99	50	400156 0413	207,-
3 - 16	MT 2	89	103	56	400156 0216	220,-
3 - 16	MT3	89	103	56	400156 0316	223,-
3 - 16	MT 4	90	104	56	400156 0416	232,-

4102

**Straight shank**

Clamping range mm	Shank Ø mm	L1 mm	L2 mm	D mm	art.no.	€
1 - 13	16 x 60	79	91	50	<b>400156 1613</b>	<b>195,-</b>

4102


**SARA® Drill chuck holding fixtures**
**DIN 238**

- **Without drill chuck**
- Alloyed case-hardened steel with a core tensile strength of min. 800 N/mm<sup>2</sup>
- Case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm, burnished
- Pre-balanced to G 6.3 / 15,000 rpm
- **Accuracy:** Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080
- Max. true running accuracy < 0.005 mm
- SK 30 holding fixtures available on request

**DIN ISO 7388-1 / DIN 69871 A**

Shank	Taper support	A mm	L mm	art.no.	€
SK 40	B 12	25	18.5	<b>436103 4012</b>	<b>38,70</b>
SK 40	B 16	25	24	436103 4016	38,70
SK 40	B 18	35	32	436103 4018	38,70
SK 50	B 16	25	24	436103 5016	49,90
SK 50	B 18	25	32	436103 5018	49,90

4117

**JIS B 6339 (MAS 403 BT) A**

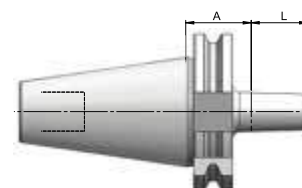
Shank	Taper support	A mm	L mm	art.no.	€
BT 40	B 12	32	18.5	<b>436107 4012</b>	<b>38,70</b>
BT 40	B 16	32	24	436107 4016	38,70
BT 40	B 18	32	32	436107 4018	38,70
BT 50	B 16	43	24	436107 5016	49,90
BT 50	B 18	43	32	436107 5018	49,90

4117

**DIN 2080**

Shank	Taper support	A mm	L mm	art.no.	€
SK 40	B 12	15	18.5	<b>436101 4012</b>	<b>37,70</b>
SK 40	B 16	17	24	436101 4016	37,70
SK 40	B 18	17	32	436101 4018	37,70
SK 50	B 16	20	24	436101 5016	48,90
SK 50	B 18	20	32	436101 5018	48,90

4117



## SARA® Plug-in shank

- For drill chucks with internal tapers in accordance with DIN 238-B
- With Morse taper shank and tangs
- Hardened and ground
- Further sizes available on request

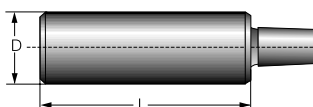
Shank	Taper support	Taper Ø mm	art.no.	€
MT 1	B 10	10.095	<b>400180 0110</b>	<b>7,30</b>
MT 1	B 12	12.065	400180 0112	<b>7,30</b>
MT 1	B 16	15.733	400180 0116	<b>7,30</b>
MT 1	B 18	17.78	400180 0118	<b>7,55</b>
MT 2	B 10	10.095	400180 0210	<b>8,30</b>
MT 2	B 12	12.065	400180 0212	<b>8,25</b>
MT 2	B 16	15.733	400180 0216	<b>8,25</b>
MT 2	B 18	17.78	400180 0218	<b>8,25</b>
MT3	B 12	12.065	400180 0312	<b>10,80</b>
MT3	B 16	15.733	400180 0316	<b>11,05</b>
MT3	B 18	17.78	400180 0318	<b>11,30</b>
MT3	B 22	21.793	400180 0322	<b>11,65</b>
MT 4	B 16	15.733	400180 0416	<b>18,25</b>
MT 4	B 18	17.78	400180 0418	<b>18,45</b>
MT 4	B 22	21.793	400180 0422	<b>18,55</b>
MT 5	B 16	15.733	400180 0516	<b>30,80</b>
MT 5	B 18	17.78	400180 0518	<b>32,-</b>
MT 5	B 22	21.793	400180 0522	<b>34,80</b>

4107



## ALBRECHT Precision plug-in shank

- For drill chucks with internal tapers in accordance with DIN 239-B
- Precision version, hardened and ground
- True-running accuracy 2 µm
- Further sizes available on request



D mm	L mm	Taper support	art.no.	€
6	35	B 06	<b>400185 0606</b>	<b>17,40</b>
8	35	B 10	400185 0810	<b>17,40</b>
10	50	B 10	400185 1010	<b>21,70</b>
10	50	B 12	400185 1012	<b>21,70</b>
12	60	B 16	400185 1216	<b>29,20</b>
16	50	B 16	400185 1616	<b>29,20</b>
20	60	B 16	400185 2016	<b>31,80</b>

4102



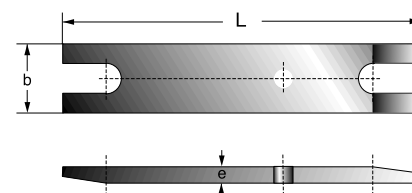
## ALBRECHT Chuck removal tool ADG

- Properly removes drill chucks from the drill chuck holding fixture
- Prevents damage to drill chucks, machine spindles or taper mandrels



L mm	b mm	e mm	suitable for taper support	art.no.	€
120	20	10	B 06	<b>400550 0006</b>	<b>26,40</b>
170	30	10	B 10, B 12	400550 1012	<b>37,20</b>
210	40	12	B 16, B 18	400550 1618	<b>39,20</b>

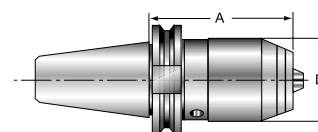
4102



## ATORN® NC short drill chuck with worm gear

- **Clamping by means of an integrated worm gear**
- Clamping range 1.0 to 16.0 mm
- High true running accuracy, max. 0.03 mm
- **Suitable for clockwise and anti-clockwise rotation**
- Long service life, wearing parts hardened and ground
- Balanced up to 7000 rpm With a residual imbalance of max. 40 g/mm
- Supplied with hexagonal key
- Max. permitted rotational speed with balanced tool 35,000 rpm

**Clamping range 1.0 to 16.0 mm  
with internal coolant supply**



### DIN 69893 ISO 12164-1 (HSK-A)

- Internal coolant supply

Shank	Clamping range mm	A mm	D mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
HSK 63	1 - 16	98	50	10	90	4	0.03	<b>440129</b> 6316	<b>325,-</b>
									4101



### DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply

Shank	Clamping range mm	A mm	D mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
SK 40	1 - 16	80	50	10	90	4	0.03	<b>440127</b> 4016	<b>244,-</b>
SK 50	1 - 16	80	50	10	90	4	0.03	<b>440127</b> 5016	<b>325,-</b>
									4101



### JIS B 6339 A (MAS BT)

- Internal coolant supply

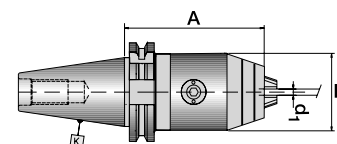
Shank	Clamping range mm	A mm	D mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
BT 40	1 - 16	88	50	10	90	4	0.03	<b>440128</b> 4016	<b>244,-</b>
									4101



## ATORN® NC short drill chuck with spur gear system

- **Clamping by means of a spur gear system**
- **Suitable for clockwise and anticlockwise rotation**
- True-running accuracy 0.02 mm
- Short clamping and retooling times
- Very short design
- For drilling, reaming, countersinking, thread cutting and simple finishing work on machining centres and CNC lathes
- Pre-balanced to G 6.3 at 25,000 rpm
- Max. permitted speed with balanced tool 35,000 rpm
- Max. permitted speed with unbalanced tool 7,000 rpm

**Clamping range 0.5 to 16.0 mm**



### DIN 69893 ISO 12164-1 (HSK-A)

- Internal coolant supply

Shank	Clamping range mm	A mm	D mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
HSK-A 63	0.5 - 16	109	57	20	90	6	0.02	<b>440137</b> 6316	<b>325,-</b>
									4101



### DIN ISO 7388-1 AD / DIN 69871 AD/AF

- Internal coolant supply

Shank	Clamping range mm	A mm	D mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
SK 40	0.5 - 16	90	57	20	90	6	0.02	<b>440139</b> 4016	<b>244,-</b>
									4101



### JIS B 6339 A (JIS B 6339)

- Internal coolant supply

Shank	Clamping range mm	A mm	D mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
BT 40	0.5 - 16	90	57	20	90	6	0.02	<b>440136</b> 4016	<b>244,-</b>
									4101



## SARA® NC short drill chuck with spur gear system

- Clamping via spur gear system
- Clockwise and anti-clockwise rotation
- True running accuracy 0.05 mm
- Reliable bevel-pinion gear
- Slim design
- Max. permitted rotational speed with unbalanced tool 7,000 rpm

### DIN ISO 7388-1 Form A / DIN 69871

Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
SK 40	0.5 - 13	50	84	20	40	6	0.05	<b>440243</b> 4013	<b>192,50</b>
SK 40	2.5 - 16	57	84	20	40	6	0.05	440243 4016	<b>197,50</b>

4108

### DIN ISO 7388-2 Form A / (JIS B6339)

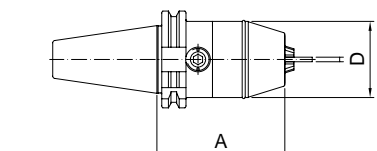
Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
BT 40	0.5 - 13	50	94	20	40	6	0.05	<b>440241</b> 4013	<b>192,50</b>
BT 40	2.5 - 16	57	94	20	40	6	0.05	440241 4016	<b>197,50</b>

4108

### DIN 2080 Form A

Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
SK 40	0.5 - 13	50	78	20	40	6	0.05	<b>440242</b> 4013	<b>192,50</b>
SK 40	2.5 - 16	57	78	20	40	6	0.05	440242 4016	<b>197,50</b>

4108



## WTE NC short drill chuck with spur gear system

- Clamping via spur gear system
- True running accuracy 0.02 mm
- High clamping force
- Short clamping and retrofitting times
- Very short design
- Suitable for clockwise and anti-clockwise rotation
- Further DIN versions available on request
- Pre-balanced to G 6.3 / 25,000 rpm
- Max. permitted rotational speed with balanced tool 35,000 rpm

### DIN ISO 7388-1 / DIN 69871

Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	Type A		Type AD/B	
								art.no.	€	art.no.	€
SK 40	0.5 - 13	50	90	20	80	6	0.02	<b>441003</b> 4013	<b>264,-</b>	<b>441005</b> 4013	<b>311,-</b>
SK 50	0.5 - 13	50	106	20	80	6	0.02	441003 5013	<b>316,-</b>	441005 5013	<b>360,-</b>

4108

4108

### MAS 403 BT - type AD/AF

Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
BT 40	0.5 - 13	50	98	20	80	6	0.02	<b>441007</b> 4013	<b>301,-</b>
BT 50	0.5 - 13	50	110	20	80	6	0.02	441007 5013	<b>341,-</b>

4108

### DIN 2080

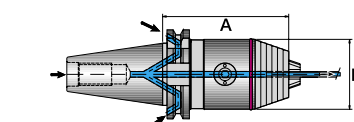
Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
SK 40	0.5 - 13	50	83	20	80	6	0.02	<b>441001</b> 4013	<b>265,-</b>
SK 50	0.5 - 13	50	100	20	80	6	0.02	441001 5013	<b>295,-</b>

4108

### With internal taper in accordance with DIN 238

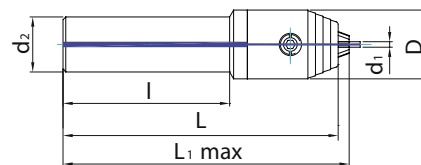
Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retaining force N	Wr. width mm	True running accuracy mm	art.no.	€
B 16	0.5 - 13	50	102	20	80	6	0.02	<b>441011</b> 1316	<b>285,-</b>
B 16	2.5 - 16	57	107	20	90	6	0.02	441011 1616	<b>290,-</b>

4108



## ATORN® Micro universal chuck

- Specially developed for micro-machining
- For machining applications in the fields of medical technology, clock and watchmaking, precision engineering and electrical engineering
- **Pre-balanced to G 2.5 / 25,000 rpm**
- True running accuracy 0.005 mm
- Clamping range from 0.2 to 3.4 mm and 0.2 to 6.4 mm



### Clamping range 0.2 to 3.4 mm

Shank	D mm	d1 mm	d2 mm	l mm	L mm	L max. mm	Weight kg	art.no.	€
Ø 16	19	0.2-3.4	16	50	80	83	0.13	442401 1608	430,-
Ø 16	19	0.2-3.4	16	70	100	103	0.16	442401 1610	450,-
Ø 16	19	0.2-3.4	16	130	160	163	0.26	442401 1616	499,-
Ø 20	19	0.2-3.4	20	52	80	83	0.17	442401 2008	430,-
Ø 20	19	0.2-3.4	20	72	100	103	0.21	442401 2010	450,-
Ø 20	19	0.2-3.4	20	132	160	163	0.36	442401 2016	499,-

4123



### Clamping range 0.2 to 6.4 mm

Shank	D mm	d1 mm	d2 mm	l mm	L mm	L max. mm	Weight kg	art.no.	€
Ø 16	25	0.2-6.4	16	60	100	104	0.3	442402 1610	450,-
Ø 16	25	0.2-6.4	16	110	150	154	0.5	442402 1615	475,-
Ø 16	25	0.2-6.4	16	160	200	204	0.7	442402 1620	519,-
Ø 20	25	0.2-6.4	20	60	100	104	0.4	442402 2010	450,-
Ø 20	25	0.2-6.4	20	110	150	154	0.6	442402 2015	475,-
Ø 20	25	0.2-6.4	20	160	200	204	0.8	442402 2020	519,-

4123



## SARA® Milling cutter extension SARAmicro

- For holding tools with a clamping surface in accordance with DIN 1835 B (shank Ø 6 - 20 mm)
- Extremely slim design allows standard tools to be extended without the need for special tools
- Extremely stable due to combination clamping
- True-running accuracy: 5 µm
- **Use:** In standard tool holding fixtures of appropriate diameter (16 / 20 / 25 or 32 mm)
- **Note:** To ensure that the tool is correctly clamped, ensure that the clamp is properly seated in the hole!

Ø mm	L mm	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm				art.no.	€
6	100	6	12	16	100	40	A1	B1	C1	445001 0006	173,-
8	100	8	14	16	100	45	A2	B2	C2	445001 0008	173,-
10	100	10	17	20	100	43	A3	B3	C3	445001 0010	176,-
12	110	12	20	25	110	39	A4	B4	C4	445001 0012	178,-
14	110	14	22	25	110	46	A5	B5	C5	445001 0014	197,50
16	125	16	25	32	125	45	A6	B6	C6	445001 0016	224,-
18	130	18	27	32	130	54	A7	B7	C7	445001 0018	224,-
20	130	20	30	32	130	62	A8	B8	C8	445001 0020	209,-

4122



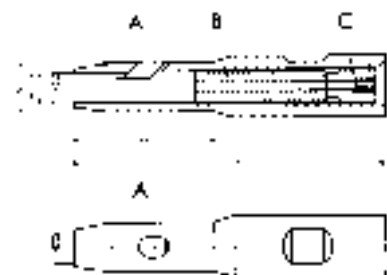
### Spare parts

	art.no.	art.no.	€	art.no.	€
A1	445010 0106	B1	445010 0206	C1	445010 0306
A2	445010 0108	B2	445010 0208	C2	445010 0308
A3	445010 0110	B3	445010 0210	C3	445010 0310
A4	445010 0112	B4	445010 0212	C4	445010 0312
A5	445010 0114	B5	445010 0214	C5	445010 0314
A6	445010 0116	B6	445010 0216	C6	445010 0316
A7	445010 0118	B7	445010 0218	C7	445010 0318
A8	445010 0120	B8	445010 0220	C8	445010 0320

4122

4122

4122

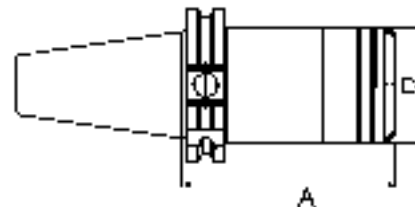


A = Clamping wedge, B = Clamping bar, C = Clamping screw

## ATORN® Precision ER collet chuck

- **30° ground trapezoidal thread with special anti-friction coating**
- Up to twice the holding forces of conventional collet chucks are possible thanks to lower friction when tightening the nut and due to the collet being seated entirely inside the chuck cone.
- Resistant to temperature fluctuations and fully suitable for dry processes and hard milling up to 200 °C.
- Clamping forces are distributed evenly across the entire cylindrical surface, and optimum radial force absorption produces perfect surfaces
- Excellent damping properties
- Increasing the chuck body to the diameter of the clamping nut creates enormous stability without any protruding contours.
- **Extremely high concentricity and precision, 3 µm**
- **Pre-balanced to G 2.5 at 22,000 rpm**
- **Leak-proof up to 80 bar with radially sealed collets**
- **For all GER collets**
- **Supplied with clamping nut**
- **Please order roller chuck key separately**
- **Torque wrench recommended**

**True-running accuracy 3 µm  
incl. clamping nut**



### DIN 69893 HSK-A, incl. clamping nut

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
HSK-A 63	1-10	GER16	55	30	<b>431236 1606</b>	<b>143,50</b>
HSK-A 63	1-10	GER16	100	30	431236 1610	143,50
HSK-A 63	1-10	GER16	160	30	431236 1616	194,50
HSK-A 63	2-16	GER25	100	40	431236 2510	146,50
HSK-A 63	2-16	GER25	160	40	431236 2516	203,-
HSK-A 63	2-20	GER32	70	50	431236 3207	148,50
HSK-A 63	2-20	GER32	100	50	431236 3210	148,50
HSK-A 63	2-20	GER32	160	50	431236 3216	205,-

4178



### DIN ISO 7388-1 / DIN 69871 AD, incl. clamping nut

- Internal coolant supply

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
SK 40	1-10	GER16	70	30	<b>431235 1607</b>	<b>118,-</b>
SK 40	1-10	GER16	100	30	431235 1610	127,50
SK 40	1-10	GER16	160	30	431235 1616	185,50
SK 40	2-16	GER25	70	40	431235 2507	121,50
SK 40	2-16	GER25	100	40	431235 2510	130,50
SK 40	2-16	GER25	160	40	431235 2516	194,50
SK 40	2-20	GER32	70	50	431235 3207	123,50
SK 40	2-20	GER32	100	50	431235 3210	132,50
SK 40	2-20	GER32	160	50	431235 3216	196,50

4178



### Roller chuck key

Designation	for clamping nut	art.no.	€
RO 30	HPC16 / HPC16-DI	<b>431240 3016</b>	<b>61,10</b>
RO 40	HPC25 / HPC25-DI	431240 3030	62,10
RO 50	HPC32 / HPC32-DI	431240 5032	62,10

4118



### Torque roller chuck key attachment

Designation	for clamping nut	for type	art.no.	€
DRO 30	HPC16 / HPC16-DI	7026030002	<b>431242 3016</b>	<b>61,10</b>
DRO 40	HPC25 / HPC25-DI	7026030003	431242 4025	62,10
DRO 50	HPC32 / HPC32-DI	7026030003	431242 5032	62,10

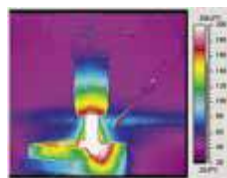
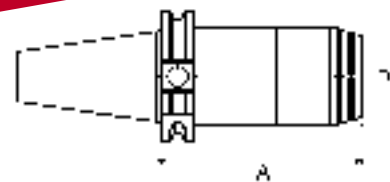
4118





**FAHRION® CENTRO|P precision ER collet chuck**

- **30° trapezoidal thread**
- With ground, extra-long double guide compared to 60° V-thread in conventional collet chucks
- Coated clamping nut reduces friction when tightening the nut
- Exact nut centring to minimise imbalance
- **Up to 100 % higher holding forces** compared with conventional collet chucks
- **Pre-balanced to G 2.5 at 25,000 rpm**
- **Entirely suitable** for dry processes and hard milling
- Insensitive to temperature fluctuations up to 200 °C
- **Leak-proof** up to 80 bar, cooling possible along the cutting edge
- **Extremely high system concentricity and precision of 3 µm achieved with a 2 µm GER-HP collet**
- **Supplied without clamping nuts or a chuck key, please order separately!**
- Slim and conical versions available on request

**True-running accuracy 1 µm**

**DIN 69893 type A (HSK-A)**

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
HSK 63	1 - 10	GER16-HP/-HPD/-HPDD	100	30	<b>431232 1030</b>	<b>121,50</b>
HSK 63	1 - 10	GER16-HP/-HPD/-HPDD	160	30	431232 1630	174,-
HSK 63	2 - 16	GER25-HP/-HPD/-HPDD	100	40	431232 1040	121,50
HSK 63	2 - 20	GER32-HP/-HPD/-HPDD	70	50	431232 0750	121,50
HSK 63	2 - 20	GER32-HP/-HPD/-HPDD	100	50	431232 1050	121,50
HSK 63	2 - 20	GER32-HP/-HPD/-HPDD	160	50	431232 1650	180,50

4118

**DIN ISO 7388-1 / DIN 69871 AD/AF**

- Internal coolant supply

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
SK 40	1 - 10	GER16-HP/-HPD/-HPDD	70	30	<b>431230 0730</b>	<b>93,60</b>
SK 40	1 - 10	GER16-HP/-HPD/-HPDD	100	30	431230 1030	104,-
SK 40	1 - 10	GER16-HP/-HPD/-HPDD	160	30	431230 1630	164,-
SK 40	2 - 16	GER25-HP/-HPD/-HPDD	45	40	431230 0440	112,-
SK 40	2 - 16	GER25-HP/-HPD/-HPDD	70	40	431230 0740	93,60
SK 40	2 - 16	GER25-HP/-HPD/-HPDD	100	40	431230 1040	104,-
SK 40	2 - 16	GER25-HP/-HPD/-HPDD	160	40	431230 1640	171,-
SK 40	2 - 20	GER32-HP/-HPD/-HPDD	50	50	431230 0550	98,70
SK 40	2 - 20	GER32-HP/-HPD/-HPDD	70	50	431230 0750	93,60
SK 40	2 - 20	GER32-HP/-HPD/-HPDD	100	50	431230 1050	104,-
SK 40	2 - 20	GER32-HP/-HPD/-HPDD	160	50	431230 1650	171,-

4118

**Clamping nuts (nuts for HPC...-DI sealing washers)**

for collets	D mm	Designation	art.no.	€
GER16-HP/-HPD/-HPDD	30	HPC-16	<b>431237 0016</b>	<b>29,50</b>
GER16-HP/-HPD/-HPDD	30	HPC-16-DI	431237 0116	36,70
GER25-HP/-HPD/-HPDD	40	HPC-25	431237 0025	32,60
GER25-HP/-HPD/-HPDD	40	HPC-25-DI	431237 0125	39,70
GER32-HP/-HPD/-HPDD	50	HPC-32	431237 0032	34,60
GER32-HP/-HPD/-HPDD	50	HPC-32-DI	431237 0132	41,70

4118

**Roller chuck key**

Designation	for clamping nut	art.no.	€
RO 30	HPC16 / HPC16-DI	<b>431240 3016</b>	<b>61,10</b>
RO 40	HPC25 / HPC25-DI	431240 3030	62,10
RO 50	HPC32 / HPC32-DI	431240 5032	62,10

4118

**Torque roller chuck key attachment**

Designation	for clamping nut	for type	art.no.	€
DRO 30	HPC16 / HPC16-DI	7026030002	<b>431242 3016</b>	<b>61,10</b>
DRO 40	HPC25 / HPC25-DI	7026030003	431242 4025	62,10
DRO 50	HPC32 / HPC32-DI	7026030003	431242 5032	62,10

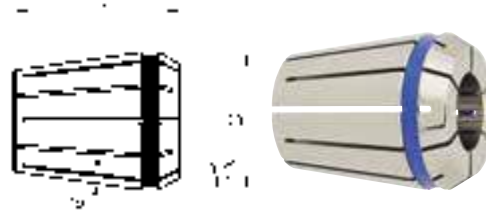
4118



**FAHRION® PRAZISION GERC-HP precision collets 2 µm**

- GERC-HP, HPD and HPDD collets 2 µm
- For Atorn precision ER collet chuck and Fahrion CENTRO|P
- Higher contact area ratio
- Increased rigidity and holding forces
- Greater system concentricity
- Optimum concentricity at nominal Ø
- Collapse h10

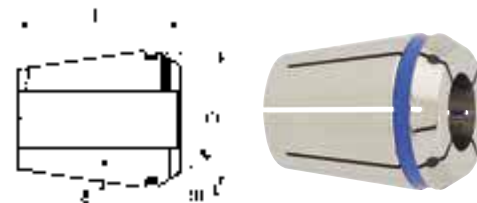
**Fahrion Protect corrosion protection**



**Standard version / type GER-HP**

Clamp Ø mm	GERC16 / 426E D = 17 mm L = 27,5 mm		GERC25 / 430E D = 26 mm L = 34 mm		GERC32 / 470E D = 33 mm L = 40 mm	
	art.no.	€	art.no.	€	art.no.	€
1	433121 0010	63,50				
2	433121 0020	47,70	433122 0020	49,30	433123 0020	50,60
3	433121 0030	40,70	433122 0030	41,80	433123 0030	42,40
4	433121 0040	40,70	433122 0040	41,80	433123 0040	42,40
5	433121 0050	40,70	433122 0050	41,80	433123 0050	42,40
6	433121 0060	40,70	433122 0060	41,80	433123 0060	42,40
7	433121 0070	40,70	433122 0070	41,80	433123 0070	42,40
8	433121 0080	40,70	433122 0080	41,80	433123 0080	42,40
9	433121 0090	40,70	433122 0090	41,80	433123 0090	42,40
10	433121 0100	40,70	433122 0100	41,80	433123 0100	42,40
	4118		4118		4118	

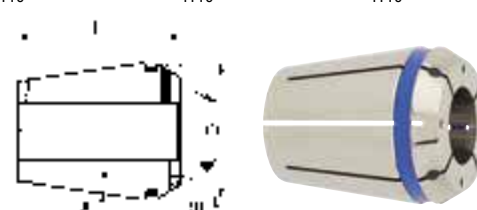
Clamp Ø mm	GERC16 / 426E D = 17 mm L = 27,5 mm		GERC25 / 430E D = 26 mm L = 34 mm		GERC32 / 470E D = 33 mm L = 40 mm	
	art.no.	€	art.no.	€	art.no.	€
11			433122 0110	41,80	433123 0110	42,40
12			433122 0120	41,80	433123 0120	42,40
13			433122 0130	41,80	433123 0130	42,40
14			433122 0140	41,80	433123 0140	42,40
15			433122 0150	41,80	433123 0150	42,40
16			433122 0160	41,80	433123 0160	42,40
17					433123 0170	42,40
18					433123 0180	42,40
20					433123 0200	42,40
	4118		4118		4118	



**With seal for internal coolant supply / type GER-HPD**

Clamp Ø mm	GERC16-HPD / 425E D = 17 mm L = 27,5 mm		GERC25-HPD / 429E D = 25,7 mm L = 34 mm		GERC32-HPD / 469E D = 32,7 mm L = 40 mm	
	art.no.	€	art.no.	€	art.no.	€
3	433124 1603	54,80				
4	433124 1604	54,80	433126 2504	57,80	433127 3204	59,80
5	433124 1605	60,10	433126 2505	63,10	433127 3205	65,10
6	433124 1606	54,80	433126 2506	57,80	433127 3206	59,80
8	433124 1608	54,80	433126 2508	57,80	433127 3208	59,80
10	433124 1610	54,80	433126 2510	57,80	433127 3210	59,80
	4118		4118		4118	

Clamp Ø mm	GERC16-HPD / 425E D = 17 mm L = 27,5 mm		GERC25-HPD / 429E D = 25,7 mm L = 34 mm		GERC32-HPD / 469E D = 32,7 mm L = 40 mm	
	art.no.	€	art.no.	€	art.no.	€
12			433126 2512	57,80	433127 3212	59,80
14			433126 2514	57,80	433127 3214	59,80
16			433126 2516	57,80	433127 3216	59,80
18					433127 3218	59,80
20					433127 3220	59,80
	4118		4118		4118	



**With seals for internal coolant supply and coolant bore / type GER-HPDD**

Clamp Ø mm	GERC25-HPDD / 429E D = 25,7 mm L = 34 mm		GERC32-HPDD / 469E D = 32,7 mm L = 40 mm	
	art.no.	€	art.no.	€
4	433129 2504	85,50	433130 3204	88,50
6	433129 2506	85,50	433130 3206	88,50
8	433129 2508	85,50	433130 3208	88,50
10	433129 2510	85,50	433130 3210	88,50
	4118		4118	

Clamp Ø mm	GERC25-HPDD / 429E D = 25,7 mm L = 34 mm		GERC32-HPDD / 469E D = 32,7 mm L = 40 mm	
	art.no.	€	art.no.	€
12	433129 2512	85,50	433130 3212	88,50
14	433129 2514	85,50	433130 3214	88,50
16			433130 3216	88,50
18			433130 3218	88,50
	4118		4118	

**Set in a wooden box, with seals for internal coolant supply / type GER-HPD**

Designation	Contents per set	Clamping range mm	art.no.	€
GERC16-HPD / 425E	Ø3-4-5-6-8-10	3 - 10	433078 0000	349,-
GERC20-HPD / 427E	Ø3-4-5-6-8-10-12	3 - 12	433078 0001	425,-
GERC25-HPD / 429E	Ø4-6-8-10-12-14-16	4 - 16	433078 0002	430,-
GERC32-HPD / 469E	Ø4-6-8-10-12-14-16-20	4 - 20	433078 0003	509,-



4118

## ALBRECHT Präzisionsspannfutter Micro precision chuck AMC

- Ideal for micro-tools
- Clamping range 1.0 to 6.0 mm
- Optional peripheral or central cooling
- Improved damping compared with shrink-fit technology
- Slim protruding contour D1 = 13.5 mm
- Perfect concentricity < 3 µm for 2.5 x D
- **Pre-balanced to G 2.5 / 25,000 rpm**

### DIN 69893 HSK-A

- Internal coolant supply
- When machining with inner coolant supply, a coolant transfer pipe Art. No. 431011.... should be used

Shank	A mm	L1 mm	L2 mm	L4 mm	D1 mm	D2 mm	Weight kg	art.no.	€
HSK-A 63	90	20	30	64	13.5	15.2	0.81	<b>441140 6309</b>	<b>286,-</b>
4102									

### DIN ISO 7388-1 AD (DIN 69871 AD)

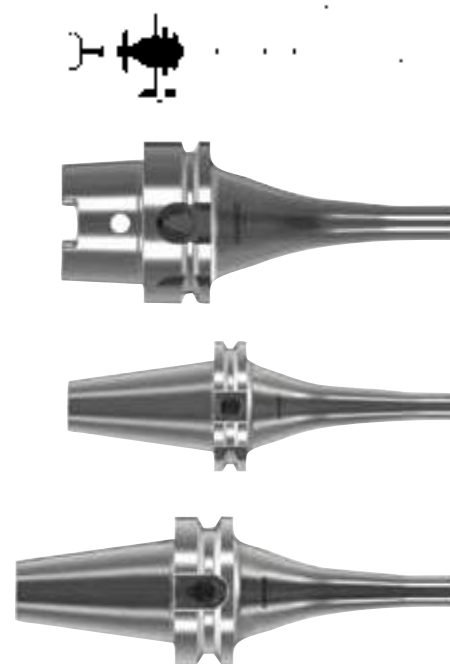
- Internal coolant supply

Shank	A mm	L1 mm	L2 mm	L4 mm	D1 mm	D2 mm	Weight kg	art.no.	€
SK 40	90	20	38	71	13.5	16.6	1.02	<b>442140 4009</b>	<b>265,-</b>
4102									

### DIN ISO 7388-2 AD (JIS B 6339)

- Internal coolant supply

Shank	A mm	L1 mm	L2 mm	L4 mm	D1 mm	D2 mm	Weight kg	art.no.	€
BT 40	90	20	30	63	13.5	15.2	1.15	<b>443140 4009</b>	<b>265,-</b>
4102									



### Clamping sleeves, sealed

- Hardened, ground and coated
- For internal coolant supply

Clamp Ø mm	art.no.	€
1	<b>440151 0001</b>	<b>175,-</b>
2	<b>440151 0002</b>	<b>114,-</b>
3	<b>440151 0003</b>	<b>95,20</b>
4	<b>440151 0004</b>	<b>95,20</b>
5	<b>440151 0005</b>	<b>95,20</b>
6	<b>440151 0006</b>	<b>95,20</b>
4102		

### Clamping sleeves

- Hardened, ground and coated

Clamp Ø mm	art.no.	€
1	<b>440141 0001</b>	<b>152,50</b>
2	<b>440141 0002</b>	<b>91,70</b>
3	<b>440141 0003</b>	<b>79,60</b>
4	<b>440141 0004</b>	<b>79,60</b>
5	<b>440141 0005</b>	<b>79,60</b>
6	<b>440141 0006</b>	<b>79,60</b>
4102		



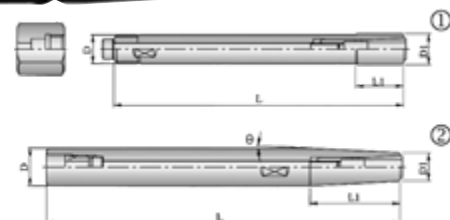
## SARA® Collet holder DC

- No clamping nuts as with traditional collet holding fixtures
- Extremely slim contour
- High true running accuracy



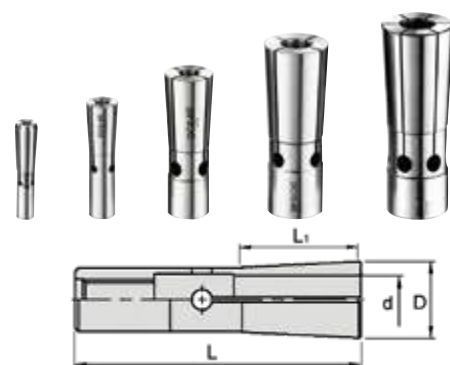
### Collet holder DC

Illustration	D mm	D1 mm	d mm	L mm	L1 mm	Angle	for collets	art.no.	€
1	10	9	2.4	90	14	-	DC4	<b>445002 4090</b>	<b>262,-</b>
2	12	9	2.4	120	38	3	DC4	<b>445002 4120</b>	<b>290,-</b>
1	12	14	2.6	120	40	-	DC6	<b>445002 6120</b>	<b>262,-</b>
2	16	14	2.6	150	35	3	DC6	<b>445002 6150</b>	<b>290,-</b>
2	20	14	2.6	200	70	3	DC6	<b>445002 6200</b>	<b>365,-</b>
2	25	14	2.6	250	115	3	DC6	<b>445002 6250</b>	<b>519,-</b>
4117									



### Collets DC

Designation	d mm	D mm	L mm	L1 mm	art.no.	€
DC4	2	7	31	10	<b>445003 4002</b>	<b>90,10</b>
DC4	3	7	31	14	<b>445003 4003</b>	<b>78,90</b>
DC4	4	7	31	14	<b>445003 4004</b>	<b>78,90</b>
DC6	3	9.6	36	14	<b>445003 6003</b>	<b>78,90</b>
DC6	4	9.6	36	14	<b>445003 6004</b>	<b>78,90</b>
DC6	6	9.6	36	16	<b>445003 6006</b>	<b>78,90</b>

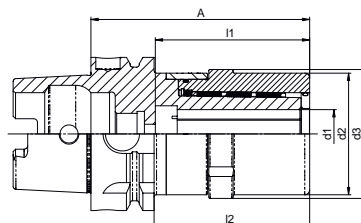


4117

## diebold Power chuck UltraGrip®

NEW

- Optimised radial run-out thanks to single-piece base body
- Maximum clamping force and stability thanks to clamping via rotary clamping nuts and needle bearings, thus clamping force of up to 4000Nm depending on  $\varnothing$
- High precision and balance quality
- Flexible use thanks to reducing bushes
- Vibration-damping effect thanks to size and multi-part design
- Maximum protection against milling tools being extracted
- Internal coolant supply up to 80 bar suitable
- Maintenance-free technology
- Supplied without chuck key
- **balanced G2.5 / 20,000 rpm**

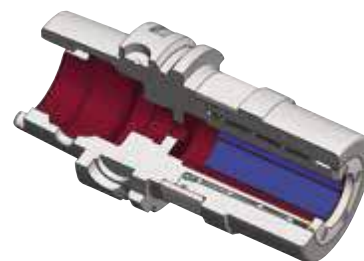


### HSK-A DIN 69893

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 431011.... should be used

Shank	d1 mm	d2 mm	d3 mm	A mm	l1 mm	l2 mm	Rotational speed max. r/min	art.no.	€
HSK-A 63	20	50	53	90	63	64	20,000	440302 6320	460,-
HSK-A 63	32	63	66	115	83	89	18,000	440302 6332	499,-
HSK-A 100	20	50	53	105	63	76	16,000	440302 1020	559,-
HSK-A 100	32	63	66	115	83	86	14,000	440302 1032	579,-

4131

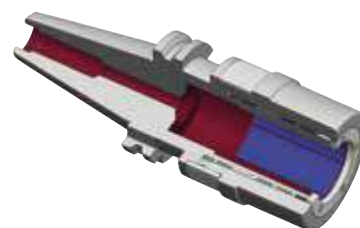


### DIN ISO 7388-1 / DIN 69871 AD/AF

- Internal coolant supply

Shank	d1 mm	d2 mm	d3 mm	A mm	l1 mm	l2 mm	Rotational speed max. r/min	art.no.	€
SK 40	20	50	53	80	63	61	18,000	440300 4020	375,-
SK 40	32	63	66	105	83	86	16,000	440300 4032	399,-

4131

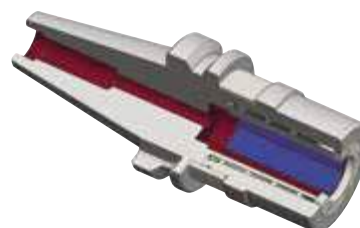


### DIN ISO 7388-2 / MAS BT JIS B 6339

- Internal coolant supply

Shank	d1 mm	d2 mm	d3 mm	A mm	l1 mm	l2 mm	Rotational speed max. r/min	art.no.	€
BT 40	20	50	53	86	63	59	18,000	440301 4020	380,-
BT 40	32	63	66	95	83	65	16,000	440301 4032	399,-

4131



## diebold Accessories for UltraGrip® and UltraJet®

### Chuck key

	for bore hole $\varnothing$ mm	art.no.	€
	20 mm	438032 0020	17,-
	32 mm	438032 0032	16,30

4131



### Extending hooks

Description	art.no.	€
for reducing bushes 433421.... and 433434....	438035 0001	8,55

4131

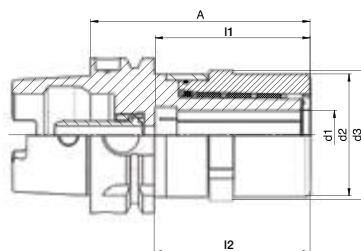


## diebold Power chuck UltraJet® 3.0

NEW

The **UltraJet® 3.0** power chuck is an innovative combination of the established **JetSleeve®** principle and the **UltraGrip® 3.0** power chuck. When using the **UltraJet® 3.0** it is almost impossible to run through the chips during heavy machining, which results in even higher cutting data and considerably longer tool service lives. The coolant supply is channelled at high pressure through the **UltraJet® 3.0** mount and through the advanced nozzle configuration onto the cutting tool. The Venturi effect keeps the mixture on the tool cutting edge, irrespective of rotational speed.

- Optimised radial run-out thanks to single-piece base body
- Maximum clamping force and stability thanks to clamping via rotary clamping nuts and needle bearings, thus clamping force of up to 4000Nm depending on Ø
- High precision and balance quality
- Flexible use thanks to reducing bushes
- Vibration-damping effect thanks to size and multi-part design
- Maximum protection against milling tools being extracted
- Internal coolant supply up to 80 bar suitable
- Maintenance-free technology
- Supplied without chuck key
- **balanced G2.5 / 20,000 rpm**



### HSK-A DIN 69893

- Internal coolant supply
- when machining with internal coolant supply, a coolant transfer pipe art.no. 431011.... should be used

Shank	d1 mm	d2 mm	d3 mm	A mm	l1 mm	l2 mm	Rotational speed max. r/min	art.no.	€
HSK-A 63	20	50	53	90	63	64	20,000	440202 6320	559,-
HSK-A 63	32	63	66	115	83	89	18,000	440202 6332	609,-
HSK-A 100	20	50	53	105	63	76	16,000	440202 1020	659,-
HSK-A 100	32	63	66	115	83	86	14,000	440202 1032	689,-

4131

### DIN ISO 7388-1 / DIN 69871 AD/AF

- Internal coolant supply

Shank	d1 mm	d2 mm	d3 mm	A mm	l1 mm	l2 mm	Rotational speed max. r/min	art.no.	€
SK 40	20	50	53	80	63	61	18,000	440200 4020	475,-
SK 40	32	63	66	105	83	86	16,000	440200 4032	499,-

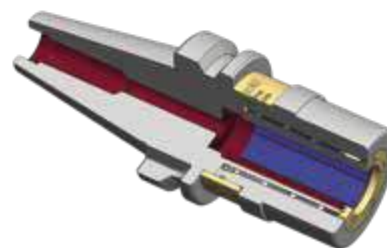
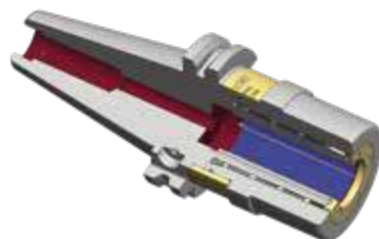
4131

### DIN ISO 7388-2 / MAS BT JIS B 6339

- Internal coolant supply

Shank	d1 mm	d2 mm	d3 mm	A mm	l1 mm	l2 mm	Rotational speed max. r/min	art.no.	€
BT 40	20	50	53	86	63	59	18,000	440201 4020	485,-
BT 40	32	63	66	95	83	65	16,000	440201 4032	509,-

4131



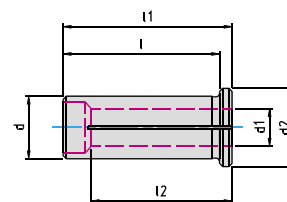
High-gloss polished...

... extremely sharp.

**ATORN®**  
Performance demands quality

## Reducing bushes

- **Slotted**
- **Mechanically sealed up to max. 80 bar**
- Suitable for hydraulic expansion chucks and power chucks
- **Seal only suitable for hydraulic expansion chucks**
- Without dirt groove
- For reducing clamping ranges
- For drilling, reaming and milling
- True running accuracy < 3 µm (at 2.5 x d)
- **Version with coolant bores available on request**



### For chuck diameter 12 mm

d mm	d1 mm	d2 mm	l mm	l1 mm	l2 mm	art.no.	€
12	3	16	40	44	29	<b>433413 0003</b>	<b>118,50</b>
12	4	16	40	44	29	433413 0004	118,50
12	5	16	40	44	29	433413 0005	118,50
12	6	16	40	44	36	433413 0006	118,50
12	8	16	40	44	37	433413 0008	118,50
12	10	16	40	44	40	433413 0010	118,50

4123

### For chuck diameter 20 mm

d mm	d1 mm	d2 mm	l mm	l1 mm	l2 mm	art.no.	€
20	3	25	50	54	28	<b>433421 0003</b>	<b>111,-</b>
20	4	25	50	54	28	433421 0004	111,-
20	5	25	50	54	28	433421 0005	111,-
20	6	25	50	54	36	433421 0006	89,50
20	8	25	50	54	37	433421 0008	89,50
20	10	25	50	54	40	433421 0010	89,50
20	12	25	50	54	45	433421 0012	89,50
20	14	25	50	54	45	433421 0014	89,50
20	16	25	50	54	48	433421 0016	89,50

4123

### For chuck diameter 25 mm

d mm	d1 mm	d2 mm	l mm	l1 mm	l2 mm	art.no.	€
25	3	30	56	60	29	<b>433422 0003</b>	<b>134,50</b>
25	4	30	56	60	29	433422 0004	120,50
25	5	30	56	60	29	433422 0005	120,50
25	6	30	56	60	37	433422 0006	120,50
25	7	30	56	60	37	433422 0007	105,-
25	8	30	56	60	37	433422 0008	105,-
25	9	30	56	60	38	433422 0009	105,-
25	10	30	56	60	40	433422 0010	105,-
25	12	30	56	60	46	433422 0012	105,-
25	14	30	56	60	47	433422 0014	105,-
25	16	30	56	60	48	433422 0016	105,-
25	18	30	56	60	48	433422 0018	105,-
25	20	30	56	60	50	433422 0020	105,-

4123

### For chuck diameter 32 mm

d mm	d1 mm	d2 mm	l mm	l1 mm	l2 mm	art.no.	€
32	6	36	60	64	36	<b>433434 0006</b>	<b>111,-</b>
32	8	36	60	64	36	433434 0008	111,-
32	10	36	60	64	40	433434 0010	111,-
32	12	36	60	64	45	433434 0012	111,-
32	14	36	60	64	46	433434 0014	111,-
32	16	36	60	64	48	433434 0016	111,-
32	18	36	60	64	49	433434 0018	111,-
32	20	36	60	64	50	433434 0020	111,-
32	25	36	60	64	56	433434 0025	111,-

4123



## HAIMER® High-precision chuck HG

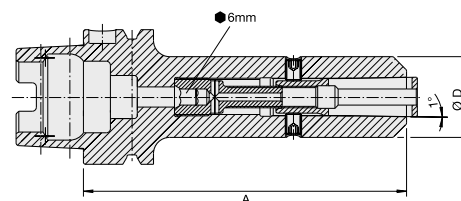
- Straight shank tools clamped with a high level precision using HG collets
- Very well suited to high-speed machining
- Taper angle tolerance quality AT3
- Finely balanced to G 2.5 at 25,000 rpm
- **True-running accuracy: 3 µm**
- Supplied with clamping screw and pull-out hook, no collet

### DIN 69893-1 HSK-A

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	Design	D mm	A mm	Designation	Clamp Ø mm	art.no.	€
HSK 63	Short	30	120	1	2 / 3 / 4 / 5 / 6 / 8	<b>431219 6301</b>	<b>198,50</b>
HSK 63	Short	35	120	2	10 / 12 / 14	431219 6302	198,50
HSK 63	Short	48	120	3	16 / 18 / 20	431219 6303	198,50
HSK 63	Extra-long	30	160	1	2 / 3 / 4 / 5 / 6 / 8	431219 6311	246,-
HSK 63	Extra-long	35	160	2	10 / 12 / 14	431219 6312	254,-
HSK 63	Extra-long	48	160	3	16 / 18 / 20	431219 6313	261,-

4165

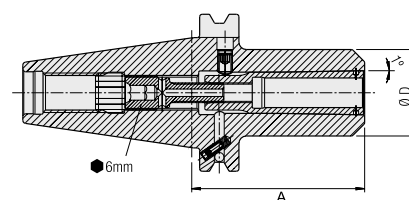


### DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply

Shank	Design	D mm	A mm	Designation	Clamp Ø mm	art.no.	€
SK 40	Short	30	65	HG 01	2 / 3 / 4 / 5 / 6 / 8	<b>431213 4001</b>	<b>136,-</b>
SK 40	Short	35	70	HG 02	10 / 12 / 14	431213 4002	136,-
SK 40	Short	48	75	HG 03	16 / 18 / 20	431213 4003	136,-
SK 40	long	30	100	HG 01	2 / 3 / 4 / 5 / 6 / 8	431213 4101	156,-
SK 40	long	35	100	HG 02	10 / 12 / 14	431213 4102	156,-
SK 40	long	48	100	HG 03	16 / 18 / 20	431213 4103	156,-

4165

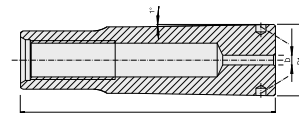


### HG collets

- **Clamp straight shank tools in HG chucks with a high level of precision**
- Further sizes available on request

suitable for	D mm	D1 mm	L mm	art.no.	€
HG 01	2	14.7	52.5	<b>431220 1020</b>	<b>126,50</b>
HG 01	3	14.7	52.5	431220 1030	126,50
HG 01	4	14.7	52.5	431220 1040	126,50
HG 01	5	14.7	52.5	431220 1050	80,40
HG 01	6	14.7	52.5	431220 1060	80,40
HG 01	8	14.7	52.5	431220 1080	80,40
HG 02	10	17.87	64.2	431220 2100	80,40
HG 02	12	17.87	64.2	431220 2120	80,40
HG 02	14	17.87	64.2	431220 2140	80,40
HG 03	16	26.15	69.7	431220 3160	80,40
HG 03	18	26.15	69.7	431220 3180	80,40
HG 03	20	26.15	69.7	431220 3200	80,40

4165

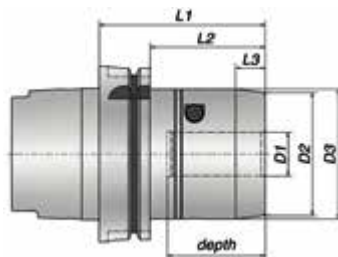




## SARA® Hydraulic expansion chuck HYDRO-Grip HD

powered by ETP

- HSK 63 and ISO 40 pre-balanced to G2.5 / 25,000 rpm
- HSK 100 and ISO 50 pre-balanced to G2.5 / 14,000 rpm
- True running accuracy < 0.004 mm at 2.5 x D
- Tool shank quality h6 or h7
- Also suitable for reducing bushes
- Rigid construction and high clamping force for heavy-duty machining

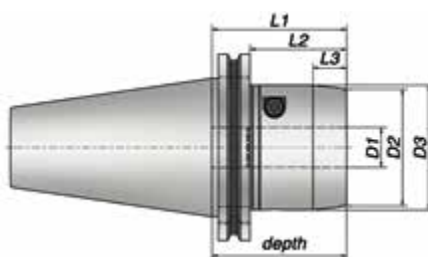


### DIN 69893 Form A - HSK-A

- Internal coolant supply
- When machining with inner coolant supply, a coolant transfer pipe Art. No. 431011.... should be used

Shank	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	Depth mm	art.no.	€
HSK-A 63	20	59	63	96	70	17	52	433826 6320	380,-
HSK-A 100	20	59	63	91	62	17	52	433826 1020	509,-
HSK-A 100	25	70	74	95	66	17	56	433826 1025	509,-
HSK-A 100	32	76	80	99	70	17	60	433826 1032	509,-

4130

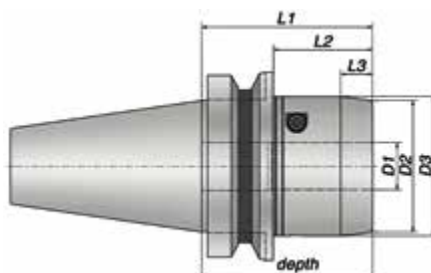


### DIN ISO 7388-1 AD (DIN 69871 AD)

- Internal coolant supply

Shank	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	Depth mm	art.no.	€
SK 40	20	59	63	90	71	17	90	433806 4020	333,-
SK 50	20	59	63	68	49	17	68	433806 5020	465,-
SK 50	25	70	74	79	60	17	79	433806 5025	465,-
SK 50	32	76	80	83	64	17	83	433806 5032	465,-

4130



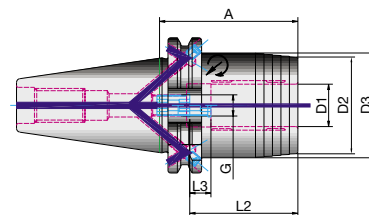
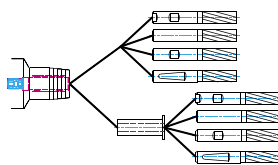
### DIN ISO 7388-2 (JIS B 6339)

Shank	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	Depth mm	art.no.	€
BT 40	20	59	63	79	60	17	79	433816 4020	333,-
BT 50	20	59	63	87	50	17	87	433816 5020	465,-
BT 50	25	70	74	91	53	17	91	433816 5025	465,-
BT 50	32	76	80	95	57	17	95	433816 5032	465,-

4130

## ATORN® Hydraulic expansion chucks

- Flexible thanks to the use of reducing bushes
- True running accuracy, maximum 3 µm
- **Balanced to G 2.5 at 25,000 rpm**
- Optimum operating temperature 20-50°C; not for use above 80°C
- Coolant pressure max. 80 bar
- Adjustment range 10 mm
- **Additional shank designs and AD/AF version available on request**
- Supplied with hexagonal T-key



### DIN ISO 7388-1 / DIN 69871 AD, short heavy-duty version

- Internal coolant supply

Shank	D1 mm	D3 mm	A mm	L2 mm	L3 mm	Thread	Weight kg	art.no.	€
SK 40	20	49.5	64.5	51	10	M16 x 1	1.3	<b>433311 4020</b>	<b>213,-</b>

4123



### DIN ISO 7388-1 / DIN 69871 AD, ultra-short version

- Internal coolant supply

Shank	D1 mm	D2 mm	D3 mm	A mm	L2 mm	Thread	Weight kg	art.no.	€
SK 40	20	48	49.5	24.5	51	M16 x 1	0.6	<b>433314 4020</b>	<b>294,-</b>

4123



### DIN ISO 7388-1 / DIN 69871 AD, short slim version

- Internal coolant supply

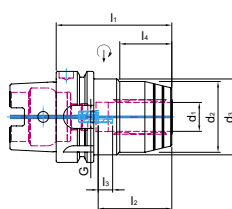
Shank	D1 mm	D2 mm	D3 mm	A mm	L2 mm	L3 mm	Thread	Weight kg	art.no.	€
SK 40	16	38	49.5	80.5	49	10	M12 x 1	1.4	<b>433303 4016</b>	<b>370,-</b>

4123



## ATORN® High-performance hydraulic expansion chuck

- **Optimum operating temperature 20-100°C**
- Max. true running accuracy < 0.003 mm
- **Pre-balanced to G 2.5 at 25,000 rpm**
- With Balluffchip bore

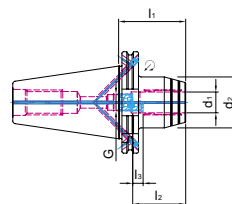


### DIN 69893 HSK-A

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	Weight kg	art.no.	€
HSK-A 63	20	49	52.5	80	51	10	36	M8x1	3 mm	1.3	<b>433409 6320</b>	<b>231,-</b>
HSK-A 100	32	70	75	100	61	10	51	M8x1	3 mm	3.8	<b>433409 1032</b>	<b>323,-</b>

4132



### DIN ISO 7388-1 / DIN 69871 AD/AF

- Internal coolant supply

Shank	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	G mm	Wr. width mm	Weight kg	art.no.	€
SK 40	20	49	64.5	51	10	M16x1	8 mm	1.4	<b>433411 4020</b>	<b>216,-</b>
SK 50	32	72	81	61	10	M16x1	8 mm	4.1	<b>433411 5032</b>	<b>308,-</b>

4132



## SARA® Hydraulic expansion chuck HG PENCIL

powered by ETP

- Extremely slim design
- For boring to finishing
- Allows machining in deep cavities
- True running accuracy < 0.004 mm at 2.5 x D (maximum 50 mm)
- Max. tightening torque 6 Nm
- For tool shanks h6 or h7
- **Pre-balanced to G 2.5 / 25,000 rpm**

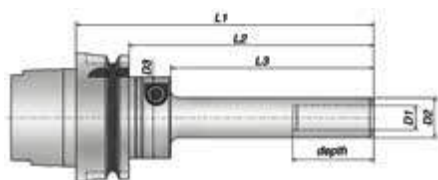


Illustration 1

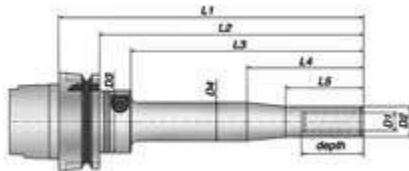


Illustration 2

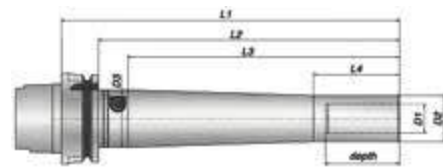


Illustration 3

### DIN 69893 Form A - HSK-A

- Internal coolant supply
- When machining with inner coolant supply, a coolant transfer pipe Art. No. 431011... should be used

Shank	Illustration	D1 mm	D2 mm	D3 mm	D4 mm	L1 mm	L2 mm	L3 mm	L4 mm	L5 mm	Depth mm	art.no.	€
HSK-A 63	1	6	12	40	-	96.5	61	50	-	-	40	<b>433801 6006</b>	499,-
HSK-A 63	1	12	19.5	40	-	96.5	61	50	-	-	40	433801 6012	420,-
HSK-A 63	1	12	19.5	40	-	146.5	111	100	-	-	40	433801 6112	450,-
HSK-A 63	2	12	19.5	40	24.5	217	161	150	75	50	40	433801 6212	509,-
HSK-A 63	3	20	32	40	-	156.5	121	110	-	-	52	433801 6020	509,-
HSK-A 63	3	20	32	40	-	257	201	190	-	-	52	433801 6120	589,-
HSK-A 100	1	12	19.5	40	-	96.5	61	50	-	-	40	433801 1012	509,-
HSK-A 100	1	12	19.5	40	-	146.5	111	100	-	-	40	433801 1112	529,-
HSK-A 100	2	12	19.5	40	24.5	217	161	150	75	50	40	433801 1212	589,-
HSK-A 100	3	20	32	40	-	156.5	121	110	-	-	52	433801 1020	589,-
HSK-A 100	3	20	32	40	-	257	201	190	-	-	52	433801 1120	679,-

4130

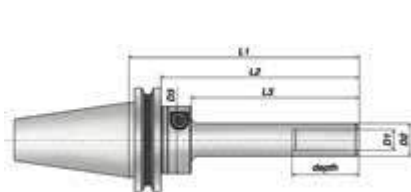


Illustration 1

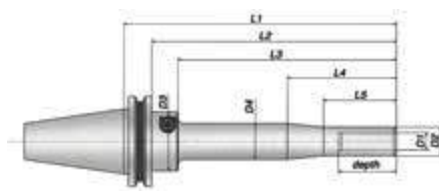


Illustration 2

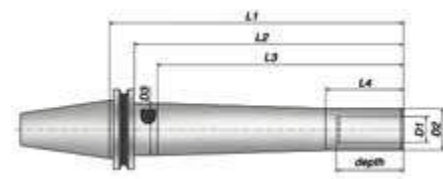


Illustration 3

### DIN ISO 7388-1 AD (DIN 69871 AD)

- Internal coolant supply

Shank	Illustration	D1 mm	D2 mm	D3 mm	D4 mm	L1 mm	L2 mm	L3 mm	L4 mm	L5 mm	Depth mm	art.no.	€
SK 40	1	6	12	40	-	87	68	50	-	-	40	<b>433802 4006</b>	480,-
SK 40	1	12	19.5	40	-	87	68	50	-	-	40	433802 4012	410,-
SK 40	1	12	19.5	40	-	137	118	100	-	-	40	433802 4112	450,-
SK 40	2	12	19.5	40	24.5	187	168	150	-	50	40	433802 4212	529,-
SK 40	3	20	32	40	-	147	128	110	60	-	52	433802 4020	445,-
SK 40	3	20	32	40	-	227	208	190	60	-	52	433802 4120	539,-
SK 50	1	12	19.5	40	-	87	68	50	-	-	40	433802 5012	485,-
SK 50	1	12	19.5	40	-	137	118	100	-	-	40	433802 5112	529,-
SK 50	2	12	19.5	40	24.5	187	168	150	75	50	40	433802 5212	629,-
SK 50	3	20	32	40	-	147	128	110	-	-	52	433802 5020	539,-
SK 50	3	20	32	40	-	227	208	190	-	-	52	433802 5120	639,-

4130



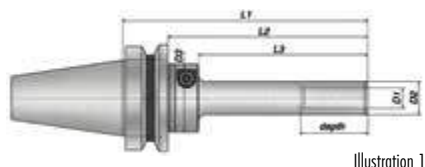


Illustration 1

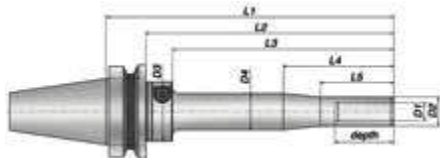


Illustration 2



Illustration 3

**DIN ISO 7388-2 (JIS B 6339)**

- Internal coolant supply

Shank	Illustration	D1 mm	D2 mm	D3 mm	D4 mm	L1 mm	L2 mm	L3 mm	L4 mm	L5 mm	Depth mm	art.no.	€
BT 40	1	6	12	40	-	95	68	50	-	-	40	<b>433803 4006</b>	480,-
BT 40	1	12	19.5	40	-	95	68	50	-	-	40	433803 4012	410,-
BT 40	1	12	19.5	40	-	145	118	100	-	-	40	433803 4112	450,-
BT 40	2	12	19.5	40	24.5	195	168	150	75	50	40	433803 4212	529,-
BT 40	3	20	32	40	-	155	128	110	60	-	52	433803 4020	445,-
BT 40	3	20	32	40	-	235	208	190	60	-	52	433803 4120	539,-
BT 50	1	12	19.5	40	-	106	68	50	-	-	40	433803 5012	485,-
BT 50	1	12	19.5	40	-	156	118	100	-	-	40	433803 5112	529,-
BT 50	2	12	19.5	40	24.5	206	168	150	75	50	40	433803 5212	629,-
BT 50	3	20	32	40	-	166	128	110	60	-	52	433803 5020	539,-
BT 50	3	20	32	40	-	246	206.5	190	60	-	52	433803 5120	639,-

4130

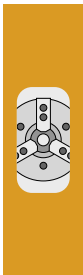
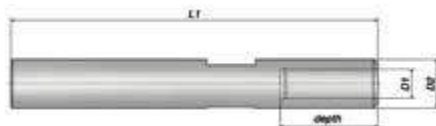


**Straight shank**

- Internal coolant supply

D1 mm	D2 mm	L1 mm	L4 mm	art.no.	€
12	20	150	40	<b>433811 2012</b>	509,-

4130



**YOUR DRILL  
GIVES UP. • WHAT DO YOU DO? YOU REACH  
FOR A NEW ONE**

**AND SIMPLY CARRY ON:  
SARA®GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
A BRAND OF SARTORIUS WERKZEUGE

## ATORN® Hydraulic expansion chuck, ultra-slim

Thanks to an innovative production process, the ultra-slim hydraulic expansion chuck combines the benefits of an expansion chuck and those of a shrink-fit chuck in a single product.

- Exceptionally high clamping forces
- Very high temperature resistance
- **Chuck remains accurate at high temperatures (up to 120 °C)**
- Designed with the slim shape of a shrink-fit chuck - suitable for use with tight protruding contours
- Very good damping
- Max. true running accuracy < 0.003 mm
- Tool changes carried out as with an expansion chuck, no need for additional equipment
- Versatile applications with reducing bushes
- **Pre-balanced to G 2.5 at 25,000 rpm**
- With Balluffchip bore



### DIN 69893 HSK-A

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	Weight kg	art.no.	€
HSK-A 63	3	9	50	120	28	16	73	M3	1.5 mm	0.9	<b>433341 0003</b>	480,-
HSK-A 63	4	10	50	120	28	12	73	M3	1.5 mm	1	433341 0004	480,-
HSK-A 63	5	11	50	120	28	8	73	M3	1.5 mm	1	433341 0005	480,-
HSK-A 63	6	12	50	120	37	10	73	M5	2.5 mm	0.9	433341 6306	440,-
HSK-A 63	8	14	50	120	37	10	74	M6	3 mm	0.9	433341 6308	440,-
HSK-A 63	10	16	50	120	41	10	74	M8x1	3 mm	1	433341 6310	440,-
HSK-A 63	12	18	50	120	46	10	75	M10x1	5 mm	1	433341 6312	440,-
HSK-A 63	6	12	50	160	37	10	113	M5	2.5 mm	1	433341 1606	549,-
HSK-A 63	8	14	50	160	37	10	114	M6	3 mm	1	433341 1608	549,-
HSK-A 63	10	16	50	160	41	10	114	M8x1	3 mm	1	433341 1610	549,-
HSK-A 63	12	18	50	160	46	10	115	M10x1	5 mm	1	433341 1612	549,-
HSK-A 63	6	12	50	200	37	10	153	M5	2.5 mm	1.1	433341 2006	729,-
HSK-A 63	8	14	50	200	37	10	154	M6	3 mm	1.1	433341 2008	729,-
HSK-A 63	10	16	50	200	41	10	154	M8x1	3 mm	1.1	433341 2010	729,-
HSK-A 63	12	18	50	200	46	10	155	M10x1	5 mm	1.1	433341 2012	729,-

4123

### DIN ISO 7388-1 / DIN 69871 AD/AF

- Internal coolant supply

Shank	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	Weight kg	art.no.	€
SK 40	3	9	49.5	120	28	16	79.5	M3	1.3 mm	1.1	<b>433340 0003</b>	440,-
SK 40	4	10	49.5	120	28	12	79.5	M3	1.3 mm	1.2	433340 0004	440,-
SK 40	5	11	49.5	120	28	8	80	M3	1.3 mm	1.2	433340 0005	440,-
SK 40	6	12	49.5	120	37	10	79.9	M5	2.5 mm	1.2	433340 4006	399,-
SK 40	8	14	49.5	120	37	10	79.9	M6	3 mm	1.2	433340 4008	399,-
SK 40	10	16	49.5	120	41	10	80.9	M8x1	3 mm	1.2	433340 4010	399,-
SK 40	12	18	49.5	120	46	10	81.9	M10x1	5 mm	1.2	433340 4012	399,-
SK 40	6	12	49.5	160	37	10	119.9	M5	2.5 mm	1.4	433340 1606	529,-
SK 40	8	14	49.5	160	37	10	119.9	M6	3 mm	1.6	433340 1608	529,-
SK 40	10	16	49.5	160	41	10	120.9	M8x1	3 mm	1.7	433340 1610	529,-
SK 40	12	18	49.5	160	46	10	121.9	M10x1	5 mm	1.7	433340 1612	529,-
SK 40	6	12	49.5	200	37	10	159.9	M5	2.5 mm	1.9	433340 2006	619,-
SK 40	8	14	49.5	200	37	10	159.9	M6	3 mm	2	433340 2008	619,-
SK 40	10	16	49.5	200	41	10	160.9	M8x1	3 mm	2	433340 2010	619,-
SK 40	12	18	49.5	200	46	10	161.9	M10x1	5 mm	2.1	433340 2012	619,-

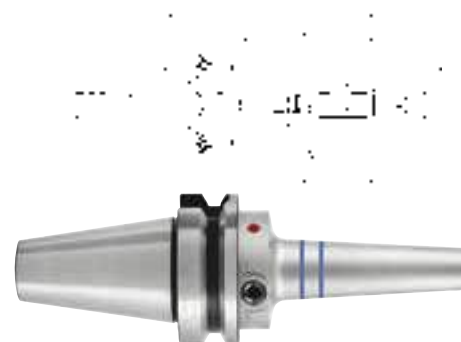
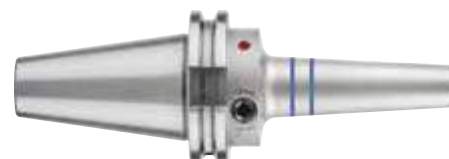
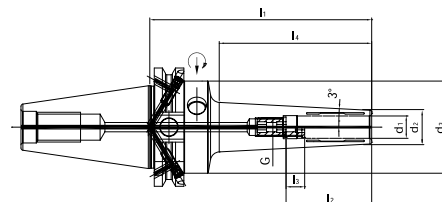
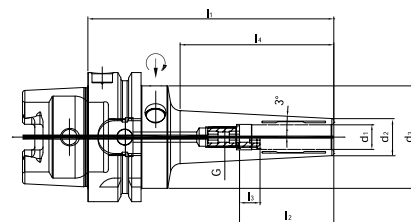
4123

### DIN ISO 7388-2 / MAS BT JIS B 6339

- Internal coolant supply

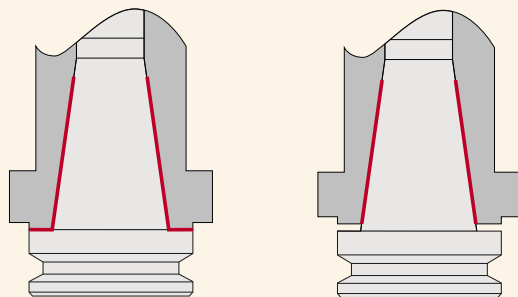
Shank	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	Weight kg	art.no.	€
BT 40	3	9	49.5	120	28	16	70.5	M3	1.5	1.3	<b>433342 4003</b>	455,-
BT 40	4	10	49.5	120	28	12	70.5	M3	1.5	1.3	433342 4004	455,-
BT 40	5	11	49.5	120	28	8	71	M3	1.5	1.3	433342 4005	455,-
BT 40	6	12	49.5	120	37	10	71.9	M5	2.5	1.3	433342 4006	395,-
BT 40	8	14	49.5	120	37	10	72.4	M6	3	1.3	433342 4008	395,-
BT 40	10	16	49.5	120	41	10	72.9	M8x1	3	1.3	433342 4010	395,-
BT 40	12	18	49.5	120	46	10	73.4	M10x1	5	1.3	433342 4012	395,-

4123

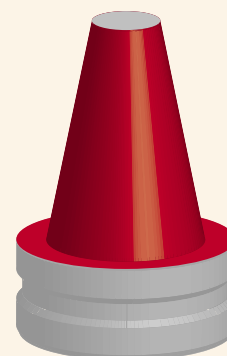


**ATORN® Tool mounts with levelling****INFO****for use in machine spindles with planar support**

- high rigidity due to the planar support between spindle and tool mount above the collar
- planar support ensures axial positioning accuracy
- suitable for high rotational speeds, spindle expansion (through centrifugal forces) have no further influence on the tool mount in axial direction
- considerable decrease in vibration through traction on the taper/planar support
- Increased service life in cutting tools



**TRACTION THROUGH TAPER/PLANAR SUPPORT**  
compared with conventional tool mounts



**FULL-SERVICE CONTACT**  
Taper and planar support

**ATORN® Transverse slot shell-type milling cutter arbour with planar support**

- **Pre-balanced to G 2.5 / 25,000 rpm**
- Taper angle tolerance quality < AT3 in accordance with DIN 7187
- Max. true running accuracy < 0.005 mm
- Internal coolant supply
- Case hardened to HRC 60 ± 2

**DIN ISO 7388-1 AD (DIN 69871 AD)**

- Internal coolant supply

Shank	d mm	D mm	L mm	L2 mm	art.no.	€
SK 40	16	38	45	17	<b>435403 4016</b>	<b>137,50</b>
SK 40	22	50	45	19	435403 4022	137,50
SK 40	27	60	50	21	435403 4027	137,50
SK 40	32	78	55	24	435403 4032	137,50
SK 50	16	38	45	17	435403 5016	158,-
SK 50	22	50	60	19	435403 5022	158,-
SK 50	27	60	60	21	435403 5027	158,-
SK 50	32	78	50	24	435403 5032	158,-

4179

**DIN ISO 7388-2 (JIS B 6339)**

- Internal coolant supply

Shank	d mm	D mm	L mm	L2 mm	art.no.	€
BT 30	16	38	35	17	<b>435407 3016</b>	<b>114,-</b>
BT 30	22	50	45	19	435407 3022	114,-
BT 30	27	60	45	21	435407 3027	114,-
BT 40	16	38	45	17	435407 4016	137,50
BT 40	22	50	45	19	435407 4022	137,50
BT 40	27	60	45	21	435407 4027	137,50
BT 40	32	78	60	24	435407 4032	137,50
BT 50	16	38	60	17	435407 5016	158,-
BT 50	22	50	60	19	435407 5022	158,-
BT 50	27	60	60	21	435407 5027	158,-
BT 50	32	78	60	24	435407 5032	158,-

4179





## ATORN® ER collet chuck with planar support

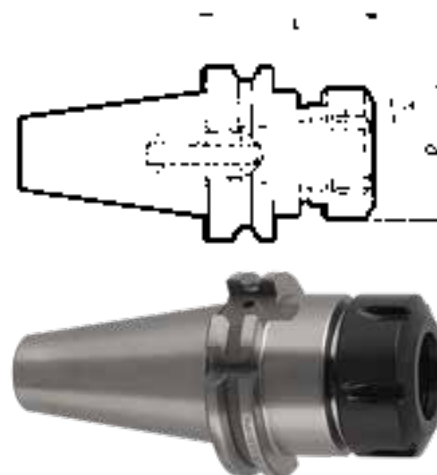
- Pre-balanced to G 2.5 / 25,000 rpm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187
- Max. true running accuracy < 0.005 mm
- Internal coolant supply
- Case hardened to HRC 60 ± 2

### DIN ISO 7388-1 AD (DIN69871 AD)

- Internal coolant supply

Shank	Clamping range mm	for collets	D mm	L mm	art.no.	€
SK 40	1 - 10	ER16	28	70	<b>431203 4016</b>	<b>147,50</b>
SK 40	2 - 16	ER25	42	70	431203 4025	147,50
SK 40	2 - 20	ER32	50	70	431203 4032	147,50
SK 40	3 - 26	ER40	63	70	431203 4040	174,-
SK 40	1 - 10	ER16	28	100	431203 4116	158,-
SK 40	2 - 16	ER25	42	100	431203 4125	158,-
SK 40	2 - 20	ER32	50	100	431203 4132	158,-
SK 40	3 - 26	ER40	63	100	431203 4140	184,50
SK 50	1 - 10	ER16	28	80	431203 5016	201,-
SK 50	2 - 16	ER25	42	80	431203 5025	201,-
SK 50	2 - 20	ER32	50	80	431203 5032	201,-
SK 50	3 - 26	ER40	63	80	431203 5040	229,-
SK 50	1 - 10	ER16	28	100	431203 5116	219,-
SK 50	2 - 16	ER25	42	100	431203 5125	219,-
SK 50	2 - 20	ER32	50	100	431203 5132	219,-
SK 50	3 - 26	ER40	63	100	431203 5140	250,-

4179



### DIN ISO 7388-2 (JIS B 6339)

- Internal coolant supply

Shank	Clamping range mm	for collets	D mm	L mm	art.no.	€
BT 30	1 - 10	ER16	28	70	<b>431107 3016</b>	<b>117,-</b>
BT 30	2 - 16	ER25	42	70	431107 3025	117,-
BT 30	2 - 20	ER32	50	70	431107 3032	117,-
BT 40	1 - 10	ER16	28	70	431107 4016	147,50
BT 40	2 - 16	ER25	42	70	431107 4025	147,50
BT 40	2 - 20	ER32	50	70	431107 4032	147,50
BT 40	3 - 26	ER40	63	70	431107 4040	174,-
BT 40	1 - 10	ER16	28	100	431107 4116	158,-
BT 40	2 - 16	ER25	42	100	431107 4125	158,-
BT 40	2 - 20	ER32	50	100	431107 4132	158,-
BT 40	3 - 26	ER40	63	100	431107 4140	184,50
BT 50	1 - 10	ER16	28	80	431107 5016	201,-
BT 50	2 - 16	ER25	42	80	431107 5025	201,-
BT 50	2 - 20	ER32	50	80	431107 5032	201,-
BT 50	3 - 26	ER40	63	80	431107 5040	229,-
BT 50	1 - 10	ER16	28	100	431107 5116	219,-
BT 50	2 - 16	ER25	42	100	431107 5125	219,-
BT 50	2 - 20	ER32	50	100	431107 5132	219,-
BT 50	3 - 26	ER40	63	100	431107 5140	250,-

4179





**ATORN® Milling cutter mount DIN6359 (Weldon) with planar support**

- Pre-balanced to G 2.5 / 25,000 rpm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187
- Max. true running accuracy < 0,005 mm
- Internal coolant supply
- Case hardened to HRC 60 ± 2

**DIN ISO 7388-1 AD (DIN 69871 AD)**

- Internal coolant supply

Shank	d mm	D mm	L mm	art.no.	€
SK 40	6	25	50	<b>434603</b> 4006	131,50
SK 40	8	28	50	434603 4008	126,50
SK 40	10	35	50	434603 4010	126,50
SK 40	12	42	50	434603 4012	126,50
SK 40	16	48	63	434603 4016	126,50
SK 40	20	52	63	434603 4020	126,50
SK 40	25	64	100	434603 4025	169,-
SK 40	32	72	100	434603 4032	169,-
SK 50	6	25	63	434603 5006	194,50
SK 50	8	28	63	434603 5008	189,50
SK 50	10	35	63	434603 5010	189,50
SK 50	12	42	63	434603 5012	189,50
SK 50	16	48	63	434603 5016	189,50
SK 50	20	52	63	434603 5020	189,50
SK 50	25	64	80	434603 5025	214,-
SK 50	32	72	100	434603 5032	214,-

4179

**DIN ISO 7388-2 (JIS B 6339)**

- Internal coolant supply

Shank	d mm	D mm	L mm	art.no.	€
BT 30	6	25	60	<b>434607</b> 3006	90,60
BT 30	8	28	60	434607 3008	90,60
BT 30	10	35	60	434607 3010	90,60
BT 30	12	42	60	434607 3012	90,60
BT 30	16	48	75	434607 3016	112,-
BT 30	20	52	75	434607 3020	112,-
BT 30	25	64	90	434607 3032	142,50
BT 40	6	25	50	434607 4006	131,50
BT 40	8	28	50	434607 4008	126,50
BT 40	10	35	63	434607 4010	126,50
BT 40	12	42	63	434607 4012	126,50
BT 40	16	48	63	434607 4016	126,50
BT 40	20	52	63	434607 4020	126,50
BT 40	25	64	100	434607 4025	169,-
BT 40	32	72	100	434607 4032	169,-
BT 50	6	25	63	434607 5006	194,50
BT 50	8	28	63	434607 5008	189,50
BT 50	10	35	63	434607 5010	189,50
BT 50	12	42	80	434607 5012	189,50
BT 50	16	48	80	434607 5016	189,50
BT 50	20	52	80	434607 5020	189,50
BT 50	25	64	100	434607 5025	214,-
BT 50	32	72	105	434607 5032	214,-

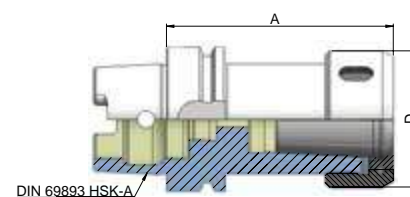
4179



## ATORN® OZ collet chuck

**DIN  
6391**

- For DIN 6388 collets
- Pre-balanced to G 2.5 / 25,000 rpm
- Alloyed case-hardened steel with a core tensile strength of min. 950 N/mm<sup>2</sup>
- case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm, burnished
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080, max. true running accuracy < 0.005 mm
- Supplied with clamping nut
- Additional shank designs and AD/AF versions available on request
- Suitable hook spanner under Article No. 701550....



### DIN 69893 type A (HSK-A)

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
HSK-A 50	2 - 16	410E / 415E	100	43	<b>431509 5016</b>	<b>95,10</b>
HSK-A 50	2 - 25	444E / 462E	100	60	431509 5025	<b>95,10</b>
HSK-A 63	2 - 16	410E / 415E	100	43	431509 6316	<b>100,50</b>
HSK-A 63	2 - 25	444E / 462E	100	60	431509 6325	<b>100,50</b>
HSK-A 63	3 - 32	450E / 467E	120	72	431509 6332	<b>106,-</b>
HSK-A 100	2 - 16	410E / 415E	110	43	431509 1016	<b>134,50</b>
HSK-A 100	2 - 25	444E / 462E	120	60	431509 1025	<b>134,50</b>
HSK-A 100	3 - 32	450E / 467E	130	72	431509 1032	<b>144,50</b>

4117



### DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
SK 40	2 - 16	410E / 415E	70	43	<b>431503 4016</b>	<b>59,-</b>
SK 40	2 - 16	410E / 415E	100	43	431503 4116	<b>73,30</b>
SK 40	2 - 25	444E / 462E	70	60	431503 4025	<b>63,10</b>
SK 40	2 - 25	444E / 462E	100	60	431503 4125	<b>76,30</b>
SK 40	3 - 32	450E / 467E	90	72	431503 4032	<b>66,20</b>
SK 50	2 - 25	444E / 462E	70	60	431503 5025	<b>82,40</b>
SK 50	3 - 32	450E / 467E	80	72	431503 5032	<b>87,-</b>
SK 50	3 - 32	450E / 467E	100	72	431503 5132	<b>102,-</b>

4117



### DIN ISO 7388-2 / MAS BT JIS B 6339

- Internal coolant supply

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
BT 40	2 - 16	410E / 415E	70	43	<b>431507 4016</b>	<b>59,-</b>
BT 40	2 - 25	444E / 462E	70	60	431507 4025	<b>63,10</b>
BT 40	3 - 32	450E / 467E	90	72	431507 4032	<b>66,20</b>
BT 50	2 - 25	444E / 462E	85	60	431507 5025	<b>82,40</b>
BT 50	3 - 32	450E / 467E	90	72	431507 5032	<b>87,-</b>

4117



### DIN 2080

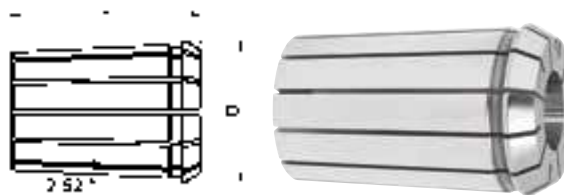
Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
SK 40	2 - 16	410E / 415E	55	43	<b>431501 4016</b>	<b>58,-</b>
SK 40	2 - 25	444E / 462E	66	60	431501 4025	<b>62,10</b>
SK 40	3 - 32	450E / 467E	95	72	431501 4032	<b>66,20</b>
SK 50	2 - 25	444E / 462E	71	60	431501 5025	<b>81,40</b>
SK 50	3 - 32	450E / 467E	73	72	431501 5032	<b>85,50</b>

4117



**FAHRION®** OZ collets  
PRAZISION
**DIN  
6388-B**

- Exceptionally flexible double-slotted version
- Higher contact area ratio, increased rigidity and holding forces, greater system concentricity
- Collapse 0.5 mm
- For clamping tools and twist drill bits on the chamfer
- True-running accuracy:
  - 415E: 6 µm
  - 462E: 6 µm
  - 467E: 10 µm

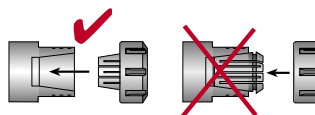


Clamp Ø mm	415E L = 40 mm D = 25,5 mm		462E L = 52 mm D = 35,05 mm		467E L = 60 mm D = 43,7 mm	
	art.no.	€	art.no.	€	art.no.	€
2	433015 0020	32,60	433016 0020	36,90		
2.5	433015 0025	37,90	433016 0025	42,10		
3	433015 0030	23,20	433016 0030	27,20		
3.5	433015 0035	28,90	433016 0035	33,10		
4	433015 0040	23,20	433016 0040	27,20	433017 0040	49,90
4.5	433015 0045	28,90	433016 0045	33,10	433017 0045	60,10
5	433015 0050	23,20	433016 0050	27,20	433017 0050	35,20
5.5	433015 0055	28,90	433016 0055	33,10	433017 0055	45,70
6	433015 0060	23,20	433016 0060	27,20	433017 0060	35,20
6.5	433015 0065	28,90	433016 0065	33,10	433017 0065	45,70
7	433015 0070	23,20	433016 0070	27,20	433017 0070	35,20
7.5	433015 0075	28,90	433016 0075	33,10	433017 0075	45,70
8	433015 0080	23,20	433016 0080	27,20	433017 0080	35,20
8.5	433015 0085	28,90	433016 0085	33,10	433017 0085	45,70
9	433015 0090	23,20	433016 0090	27,20	433017 0090	35,20
9.5	433015 0095	28,90	433016 0095	33,10	433017 0095	45,70
10	433015 0100	23,20	433016 0100	27,20	433017 0100	35,20
10.5	433015 0105	28,90	433016 0105	33,10	433017 0105	45,70
11	433015 0110	23,20	433016 0110	27,20	433017 0110	35,20
11.5	433015 0115	28,90	433016 0115	33,10	433017 0115	45,70
12	433015 0120	23,20	433016 0120	27,20	433017 0120	35,20
12.5	433015 0125	28,90	433016 0125	33,10	433017 0125	45,70
	4119		4119		4119	

Clamp Ø mm	415E L = 40 mm D = 25,5 mm		462E L = 52 mm D = 35,05 mm		467E L = 60 mm D = 43,7 mm	
	art.no.	€	art.no.	€	art.no.	€
13	433015 0130	23,20	433016 0130	27,20	433017 0130	35,20
13.5	433015 0135	28,90	433016 0135	33,10	433017 0135	45,70
14	433015 0140	23,20	433016 0140	27,20	433017 0140	35,20
14.5	433015 0145	28,90	433016 0145	33,10	433017 0145	45,70
15	433015 0150	23,20	433016 0150	27,20	433017 0150	35,20
15.5	433015 0155	28,90	433016 0155	33,10	433017 0155	45,70
16	433015 0160	23,20	433016 0160	27,20	433017 0160	35,20
17			433016 0170	27,20	433017 0170	35,20
18			433016 0180	27,20	433017 0180	35,20
20			433016 0200	27,20	433017 0200	35,20
21			433016 0210	27,20	433017 0210	35,20
22			433016 0220	27,20	433017 0220	35,20
23			433016 0230	27,20	433017 0230	35,20
24			433016 0240	27,20	433017 0240	35,20
25			433016 0250	27,20	433017 0250	35,20
26					433017 0260	35,20
27					433017 0270	35,20
28					433017 0280	35,20
29					433017 0290	35,20
30					433017 0300	35,20
31					433017 0310	35,20
32					433017 0320	35,20
	4119		4119		4119	

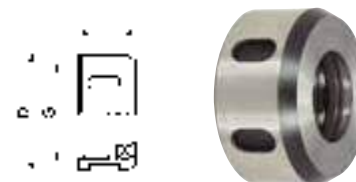
**OZ clamping nuts**

- For collets in accordance with DIN 6388 (OZ)
- With ball bearing-mounted pressure ring
- For higher holding forces and better concentricity
- Suitable hook spanner under Article No. 701550....



suitable for	Clamping range mm	D mm	L mm	Thread	art.no.	€
410E/415E	2 - 16	43	24	M33 x 1.5	431014 0216	38,30
444E/462E	2 - 25	60	30	M48 x 2.0	431014 0225	43,80
450E/467E	3 - 32	72	33.5	M60 x 2.5	431014 0332	51,70

4120



## ATORN® ER collet chuck

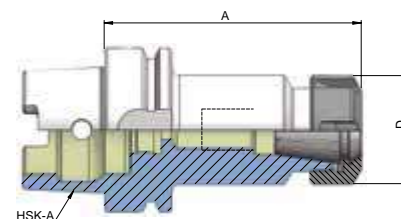
- For DIN 6499 ER collets
- Pre-balanced to G 2.5 / 25,000 rpm
- Alloyed case-hardened steel with a core tensile strength of min. 950 N/mm<sup>2</sup>, case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm, burnished
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080, max. true running accuracy < 0.005 mm
- Supplied with clamping nut
- Additional shank designs and AD/AF version available on request
- ER16 / 426E\* tool holding fixtures supplied with hexagonal nut

### DIN 69893 type A (HSK-A)

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
HSK-A 50	1 - 10	ER16 / 426E *	100	32	<b>431009 5010</b>	<b>87,-</b>
HSK-A 50	2 - 16	ER25 / 430E	100	42	431009 5016	87,-
HSK-A 50	2 - 20	ER32 / 470E	100	50	431009 5020	92,10
HSK-A 63	1 - 10	ER16 / 426E *	100	32	431009 6310	87,-
HSK-A 63	1 - 10	ER16 / 426E *	160	32	431009 6410	113,-
HSK-A 63	2 - 16	ER25 / 430E	100	42	431009 6316	83,40
HSK-A 63	2 - 16	ER25 / 430E	160	42	431009 6416	110,-
HSK-A 63	2 - 20	ER32 / 470E	100	50	431009 6320	87,-
HSK-A 63	2 - 20	ER32 / 470E	160	50	431009 6420	113,-
HSK-A 63	3 - 26	ER40 / 472E	120	63	431009 6326	92,10
HSK-A 100	2 - 16	ER25 / 430E	100	42	431009 1016	116,-
HSK-A 100	2 - 20	ER32 / 470E	100	50	431009 1020	116,-
HSK-A 100	3 - 26	ER40 / 472E	120	63	431009 1026	121,50

4117

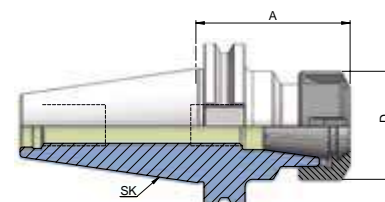


### DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
SK 40	1 - 10	ER16 / 426E *	63	32	<b>431003 4010</b>	<b>46,80</b>
SK 40	1 - 10	ER16 / 426E *	100	32	431003 4110	54,-
SK 40	1 - 10	ER16 / 426E *	160	32	431003 4210	89,-
SK 40	2 - 16	ER25 / 430E	60	42	431003 4016	46,80
SK 40	2 - 16	ER25 / 430E	100	42	431003 4116	60,10
SK 40	2 - 16	ER25 / 430E	160	42	431003 4216	89,-
SK 40	2 - 20	ER32 / 470E	70	50	431003 4020	49,90
SK 40	2 - 20	ER32 / 470E	100	50	431003 4120	60,10
SK 40	2 - 20	ER32 / 470E	160	50	431003 4220	91,10
SK 40	3 - 26	ER40 / 472E	80	63	431003 4026	52,90
SK 40	3 - 26	ER40 / 472E	100	63	431003 4126	66,20
SK 40	3 - 26	ER40 / 472E	160	63	431003 4226	97,20
SK 50	1 - 10	ER16 / 426E	100	32	431003 5010	89,-
SK 50	1 - 10	ER16 / 426E	160	32	431003 5210	122,50
SK 50	2 - 16	ER25 / 430E	60	42	431003 5016	73,30
SK 50	2 - 16	ER25 / 430E	100	42	431003 5116	89,-
SK 50	2 - 16	ER25 / 430E	160	42	431003 5216	122,50
SK 50	2 - 20	ER32 / 470E	70	50	431003 5020	76,30
SK 50	2 - 20	ER32 / 470E	100	50	431003 5120	106,-
SK 50	2 - 20	ER32 / 470E	160	50	431003 5220	122,50
SK 50	2 - 20	ER32 / 470E	200	50	431003 5230	164,-
SK 50	3 - 26	ER40 / 472E	80	63	431003 5026	76,30
SK 50	3 - 26	ER40 / 472E	100	63	431003 5126	109,-
SK 50	3 - 26	ER40 / 472E	160	63	431003 5226	125,50
SK 50	3 - 26	ER40 / 472E	200	63	431003 5326	170,-

4117



**DIN ISO 7388-2 / MAS BT JIS B 6339**

- Internal coolant supply

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
BT 40	1 - 10	ER16 / 426E *	63	32	<b>431007 4010</b>	<b>46,80</b>
BT 40	1 - 10	ER16 / 426E *	100	32	431007 4110	54,-
BT 40	2 - 16	ER25 / 430E	60	42	431007 4016	46,80
BT 40	2 - 16	ER25 / 430E	100	42	431007 4116	67,20
BT 40	2 - 20	ER32 / 470E	70	50	431007 4020	49,90
BT 40	2 - 20	ER32 / 470E	100	50	431007 4120	60,10
BT 40	3 - 26	ER40 / 472E	80	63	431007 4026	52,90
BT 40	3 - 26	ER40 / 472E	100	63	431007 4126	66,20
BT 50	2 - 16	ER25 / 230E	70	42	431007 5016	80,40
BT 50	2 - 20	ER32 / 470E	70	50	431007 5020	76,30
BT 50	3 - 26	ER40 / 472E	80	63	431007 5026	76,30

4117

**DIN 2080**

Shank	Clamping range mm	for collets	A mm	D mm	art.no.	€
SK 40	1 - 10	ER16 / 426E *	50	32	<b>431001 4010</b>	<b>46,80</b>
SK 40	2 - 16	ER25 / 430E	50	42	431001 4016	46,80
SK 40	2 - 20	ER32 / 470E	50	50	431001 4020	48,90
SK 40	3 - 26	ER40 / 472E	80	63	431001 4026	51,90
SK 50	2 - 20	ER32 / 470E	63	50	431001 5020	75,30
SK 50	3 - 26	ER40 / 472E	63	63	431001 5026	75,30

4117

**With straight shank**

- True running accuracy < 15 µm

D1 mm	Clamping range mm	for collets	L1 mm	L mm	D mm	art.no.	€
20	1.5 - 16	ER25	50	46	42	<b>431016 2001</b>	<b>107,-</b>
20	1.5 - 16	ER25	100	46	42	431016 2002	114,-
20	2 - 20	ER32	100	54	50	431016 2003	182,50
25	1 - 16	ER25	50	40	42	431016 2501	114,-
25	1 - 16	ER25	100	40	42	431016 2502	114,-
25	2 - 20	ER32	50	52	50	431016 2503	182,50
32	2 - 20	ER32	50	48	50	431016 3202	152,-
32	2 - 20	ER32	100	48	50	431016 3212	141,50
32	3 - 26	ER40	70	60	63	431016 3203	193,50
40	2 - 20	ER32	80	33	50	431016 4001	193,50

4120



# ECOGRIP ER



- **Simple, quick and precise**
- **Turns your ER collet system into a hydraulic expansion chuck with adjustable true running accuracy to 0.003 mm**



Video on YouTube

## ATORN® ER precision collets 2 µm

- True running accuracy 2 µm
- For greater system concentricity
- Collapse h10
- **Sealed collets for internal coolant supply and collet sets available on request**



Clamp Ø mm	ER16UP/426E D = 17 mm L = 27,5 mm		ER25UP/430E D = 26 mm L = 34 mm		ER32UP/470E D = 33 mm L = 40 mm		ER40UP/472E D = 41 mm L = 46 mm	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€
1	433621 0010	53,30	433622 0010	45,10				
1.5	433621 0015	53,30	433622 0015	45,10				
2	433621 0020	42,-	433622 0020	44,40	433623 0020	45,50		
2.5	433621 0025	42,-	433622 0025	44,40	433623 0025	45,50		
3	433621 0030	36,70	433622 0030	37,70	433623 0030	38,10	433624 0030	60,10
3.5	433621 0035	49,90	433622 0035	50,30	433623 0035	51,10	433624 0035	68,20
4	433621 0040	36,70	433622 0040	37,70	433623 0040	38,10	433624 0040	54,-
4.5	433621 0045	49,90	433622 0045	50,30	433623 0045	51,10	433624 0045	68,20
5	433621 0050	36,70	433622 0050	37,70	433623 0050	38,10	433624 0050	54,-
5.5	433621 0055	49,90	433622 0055	50,30	433623 0055	51,10	433624 0055	68,20
6	433621 0060	36,70	433622 0060	37,70	433623 0060	38,10	433624 0060	54,-
6.5	433621 0065	49,90	433622 0065	50,30	433623 0065	51,10	433624 0065	68,20
7	433621 0070	36,70	433622 0070	37,70	433623 0070	38,10	433624 0070	54,-
7.5	433621 0075	49,90	433622 0075	50,30	433623 0075	51,10	433624 0075	68,20
8	433621 0080	36,70	433622 0080	37,70	433623 0080	38,10	433624 0080	54,-
8.5	433621 0085	49,90	433622 0085	50,30	433623 0085	51,10	433624 0085	68,20
9	433621 0090	36,70	433622 0090	37,70	433623 0090	38,10	433624 0090	54,-
9.5	433621 0095	49,90	433622 0095	50,30	433623 0095	51,10	433624 0095	68,20
10	433621 0100	36,70	433622 0100	37,70	433623 0100	38,10	433624 0100	54,-
10.5			433622 0105	50,30	433623 0105	51,10	433624 0105	68,20
11			433622 0110	37,70	433623 0110	38,10	433624 0110	54,-
11.5			433622 0115	50,30	433623 0115	51,10	433624 0115	68,20
12			433622 0120	37,70	433623 0120	38,10	433624 0120	54,-
12.5			433622 0125	50,30	433623 0125	51,10	433624 0125	68,20
13			433622 0130	37,70	433623 0130	38,10	433624 0130	54,-
13.5			433622 0135	50,30	433623 0135	51,10	433624 0135	68,20
14			433622 0140	37,70	433623 0140	38,10	433624 0140	54,-
14.5			433622 0145	50,30	433623 0145	51,10	433624 0145	68,20
15			433622 0150	37,70	433623 0150	38,10	433624 0150	54,-
15.5			433622 0155	50,30	433623 0155	51,10	433624 0155	68,20
16			433622 0160	37,70	433623 0160	38,10	433624 0160	54,-
16.5					433623 0165	51,10	433624 0165	68,20
17					433623 0170	38,10	433624 0170	54,-
17.5					433623 0175	51,10	433624 0175	68,20
18					433623 0180	38,10	433624 0180	54,-
18.5					433623 0185	51,10	433624 0185	68,20
19					433623 0190	38,10	433624 0190	54,-
19.5					433623 0195	51,10	433624 0195	68,20
20					433623 0200	38,10	433624 0200	54,-
20.5							433624 0205	68,20
21							433624 0210	54,-
21.5							433624 0215	68,20
22							433624 0220	54,-
22.5							433624 0225	68,20
23							433624 0230	54,-
23.5							433624 0235	68,20
24							433624 0240	54,-
24.5							433624 0245	68,20
25							433624 0250	54,-
25.5							433624 0255	68,20
26							433624 0260	54,-
	4202		4202		4202		4202	

## ATORN® ER precision collets 5 µm

- True running accuracy 5µm
- for greater system true running accuracy
- Collapse 0.5mm
- **sealed collets for internal coolant supply available on request**



### Single

Clamp Ø mm	ER16HP/426E D = 17 mm L = 27,5 mm		ER25HP/430E D = 26 mm L = 34 mm		ER32HP/470E D = 33 mm L = 40 mm		ER40HP/472E D = 41 mm L = 46 mm	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€
1	433221 0010	22,50	433222 0010	24,60				
1.5	433221 0015	22,50	433222 0015	24,60				
2	433221 0020	22,50	433222 0020	24,60	433223 0020	25,80		
2.5	433221 0025	22,50	433222 0025	24,60	433223 0025	25,80		
3	433221 0030	17,70	433222 0030	18,85	433223 0030	20,10	433224 0030	34,80
3.5	433221 0035	30,50	433222 0035	31,60	433223 0035	32,50	433224 0035	37,30
4	433221 0040	17,70	433222 0040	18,85	433223 0040	20,10	433224 0040	26,-
4.5	433221 0045	30,50	433222 0045	31,60	433223 0045	32,50	433224 0045	37,30
5	433221 0050	17,70	433222 0050	18,85	433223 0050	20,10	433224 0050	26,-
5.5	433221 0055	30,50	433222 0055	31,60	433223 0055	32,50	433224 0055	37,30
6	433221 0060	17,70	433222 0060	18,85	433223 0060	20,10	433224 0060	26,-
6.5	433221 0065	30,50	433222 0065	31,60	433223 0065	32,50	433224 0065	37,30
7	433221 0070	17,70	433222 0070	18,85	433223 0070	20,10	433224 0070	26,-
7.5	433221 0075	30,50	433222 0075	31,60	433223 0075	32,50	433224 0075	37,30
8	433221 0080	17,70	433222 0080	18,85	433223 0080	20,10	433224 0080	26,-
8.5	433221 0085	30,50	433222 0085	31,60	433223 0085	32,50	433224 0085	37,30
9	433221 0090	17,70	433222 0090	18,85	433223 0090	20,10	433224 0090	26,-
9.5	433221 0095	30,50	433222 0095	31,60	433223 0095	32,50	433224 0095	37,30
10	433221 0100	17,70	433222 0100	18,85	433223 0100	20,10	433224 0100	26,-
10.5			433222 0105	31,60	433223 0105	32,50	433224 0105	37,30
11			433222 0110	18,85	433223 0110	20,10	433224 0110	26,-
11.5			433222 0115	31,60	433223 0115	32,50	433224 0115	37,30
12			433222 0120	18,85	433223 0120	20,10	433224 0120	26,-
12.5			433222 0125	31,60	433223 0125	32,50	433224 0125	37,30
13			433222 0130	18,85	433223 0130	20,10	433224 0130	26,-
13.5			433222 0135	31,60	433223 0135	32,50	433224 0135	37,30
14			433222 0140	18,85	433223 0140	20,10	433224 0140	26,-
14.5			433222 0145	31,60	433223 0145	32,50	433224 0145	37,30
15			433222 0150	18,85	433223 0150	20,10	433224 0150	26,-
15.5			433222 0155	31,60	433223 0155	32,50	433224 0155	37,30
16			433222 0160	18,85	433223 0160	20,10	433224 0160	26,-
16.5							433224 0165	37,30
17					433223 0170	20,10	433224 0170	26,-
17.5					433223 0175	32,50	433224 0175	37,30
18					433223 0180	20,10	433224 0180	26,-
18.5					433223 0185	32,50	433224 0185	37,30
19					433223 0190	20,10	433224 0190	26,-
19.5					433223 0195	32,50	433224 0195	37,30
20					433223 0200	20,10	433224 0200	26,-
20.5							433224 0205	37,30
21							433224 0210	26,-
21.5							433224 0215	37,30
22							433224 0220	26,-
22.5							433224 0225	37,30
23							433224 0230	26,-
23.5							433224 0235	37,30
24							433224 0240	26,-
24.5							433224 0245	37,30
25							433224 0250	26,-
25.5							433224 0255	37,30
26							433224 0260	26,-
	4202		4202		4202		4202	

Continued on next page &gt;&gt;&gt;



Sets

Designation	Contents per set	Clamping range mm	art.no.	€
ER16HP	10-pcs.	Ø1mm - Ø10mm	433081 0016	213,-
ER25HP	15-pcs.	Ø2mm - Ø16mm	433081 0025	318,-
ER32HP	18-pcs.	Ø3mm - Ø20mm	433081 0032	399,-
ER40HP	23-pcs.	Ø4mm - Ø26mm	433081 0040	599,-

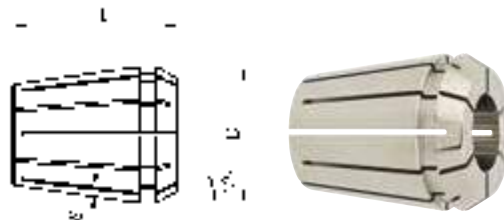
4202



433081 0032

**FAHRION®** GERC collets 5 µm

- Collapse of 1 mm (0.5 mm with clamping diameters of 1 to 2 mm)
- True-running accuracy 5 µm



Standard version / type GERC-B

Clamp Ø mm	GERC16 / 426E D = 17 mm L = 27,5 mm		GERC25 430E D = 26 mm L = 34 mm		GERC32 470E D = 33 mm L = 40 mm		GERC40 472E D = 41 mm L = 46 mm	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€
1	433071 0010	25,-	433073 0010	27,30				
1.5	433071 0015	25,-	433073 0015	27,30				
2	433071 0020	25,-	433073 0020	27,30	433074 0020	28,70		
2.5	433071 0025	25,-	433073 0025	27,30	433074 0025	28,70		
3	433071 0030	19,70	433073 0030	21,-	433074 0030	22,30	433075 0030	38,70
3.5	433071 0035	33,90	433073 0035	35,-	433074 0035	36,10		
4	433071 0040	19,70	433073 0040	21,-	433074 0040	22,30	433075 0040	28,80
4.5	433071 0045	33,90	433073 0045	35,-	433074 0045	36,10		
5	433071 0050	19,70	433073 0050	21,-	433074 0050	22,30	433075 0050	28,80
5.5	433071 0055	33,90	433073 0055	35,-	433074 0055	36,10		
6	433071 0060	19,70	433073 0060	21,-	433074 0060	22,30	433075 0060	28,80
6.5	433071 0065	33,90	433073 0065	35,-	433074 0065	36,10		
7	433071 0070	19,70	433073 0070	21,-	433074 0070	22,30	433075 0070	28,80
7.5	433071 0075	33,90	433073 0075	35,-	433074 0075	36,10		
8	433071 0080	19,70	433073 0080	21,-	433074 0080	22,30	433075 0080	28,80
8.5	433071 0085	33,90	433073 0085	35,-	433074 0085	36,10	433075 0085	43,20
9	433071 0090	19,70	433073 0090	21,-	433074 0090	22,30	433075 0090	28,80
9.5	433071 0095	33,90	433073 0095	35,-	433074 0095	36,10		
10	433071 0100	19,70	433073 0100	21,-	433074 0100	22,30	433075 0100	28,80
10.5			433073 0105	35,-	433074 0105	36,10	433075 0105	43,20
11			433073 0110	21,-	433074 0110	22,30	433075 0110	28,80
11.5			433073 0115	35,-	433074 0115	36,10		
12			433073 0120	21,-	433074 0120	22,30	433075 0120	28,80
12.5			433073 0125	35,-	433074 0125	36,10		
13			433073 0130	21,-	433074 0130	22,30	433075 0130	28,80
13.5			433073 0135	35,-	433074 0135	36,10		
14			433073 0140	21,-	433074 0140	22,30	433075 0140	28,80
14.5			433073 0145	35,-	433074 0145	36,10		
15			433073 0150	21,-	433074 0150	22,30	433075 0150	28,80
15.5			433073 0155	35,-	433074 0155	36,10		
16			433073 0160	21,-	433074 0160	22,30	433075 0160	28,80
17					433074 0170	22,30	433075 0170	28,80
18					433074 0180	22,30	433075 0180	28,80
19							433075 0190	28,80
20					433074 0200	22,30	433075 0200	28,80
21							433075 0210	28,80
22							433075 0220	28,80
23							433075 0230	28,80
24							433075 0240	28,80
25							433075 0250	28,80
26							433075 0260	28,80

4119

4119

4119

4119

**Set in a wooden box, standard increasing in increments of 1 mm / type GERC-B**

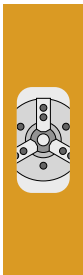
Designation	Contents per set	Clamping range mm	art.no.	€
GERC 16 426E	10-pcs.	1 - 10	<b>433076 0000</b>	<b>225,-</b>
GERC 20 428E	12-pcs.	2 - 13	433076 0001	275,-
GERC 25 430E	15-pcs.	2 - 16	433076 0002	347,-
GERC 32 470E	18-pcs.	3 - 20	433076 0003	435,-
GERC 40 472E	23-pcs.	4 - 26	433076 0004	709,-

4119



**With seal for internal coolant supply / type GERC-BD**

Clamp Ø mm	GERC16-BD 425E D = 16,7 mm L = 27,5 mm		GERC25-BD 429E D = 25,7 mm L = 34 mm		GERC32-BD 429E D = 32,7 mm L = 40 mm		GERC40-BD 471E D = 40,7 mm L = 46 mm	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€
3	<b>433131 1603</b>	<b>47,-</b>	<b>433133 2503</b>	<b>54,80</b>	<b>433134 3203</b>	<b>56,80</b>		
4	433131 1604	47,-	433133 2504	49,10	433134 3204	51,10		
5	433131 1605	52,70	433133 2505	54,80	433134 3205	56,80		
6	433131 1606	47,-	433133 2506	49,10	433134 3206	51,10	<b>433135 4006</b>	<b>60,10</b>
8	433131 1608	47,-	433133 2508	49,10	433134 3208	51,10	433135 4008	60,10
10	433131 1610	47,-	433133 2510	49,10	433134 3210	51,10	433135 4010	60,10
12			433133 2512	49,10	433134 3212	51,10	433135 4012	60,10
14			433133 2514	49,10	433134 3214	51,10	433135 4014	60,10
16			433133 2516	49,10	433134 3216	51,10	433135 4016	60,10
18					433134 3218	51,10	433135 4018	60,10
20					433134 3220	51,10	433135 4020	60,10
22							433135 4022	66,20
25							433135 4025	60,10
			4118		4118		4118	



**Set in a wooden box, with seals for internal coolant supply / type GERC-D**

Designation	Contents per set	Clamping range mm	art.no.	€
GERC16-BD / 425E	Ø3-4-5-6-8-10	3 - 10	<b>433077 0001</b>	<b>303,-</b>
GERC20-BD / 427E	Ø3-4-5-6-8-10-12	3 - 12	433077 0002	365,-
GERC25-BD / 429E	Ø4-6-8-10-12-14-16	4 - 16	433077 0003	365,-
GERC32-BD / 469E	Ø4-6-8-10-12-14-16-20	4 - 20	433077 0004	435,-

4118



Best surfaces...

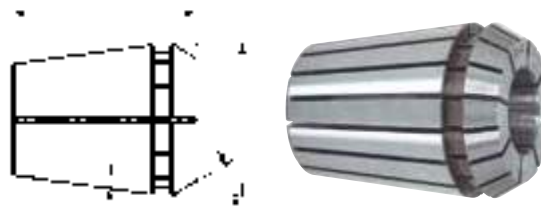
... with curve segment.

**ATORN®**  
Performance demands quality

## SARA® ER collets, 10 µm

**DIN  
6499-B**

- Collapse of 1 mm (for ER11; 0.5 mm for clamping diameters of 1 to 2 mm)
- True running accuracy 10 µm



### Individual

Ø mm	ER11 4008E D = 11,5 mm L = 18 mm		ER16 426E D = 17 mm L = 27,5 mm		ER25 430E D = 26 mm L = 34 mm		ER32 470E D = 33 mm L = 40 mm		ER40 472E D = 41 mm L = 46 mm	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
1	433210 0010	17,10	433211 0010	16,40						
1.5	433210 0015	17,10								
2	433210 0020	17,10	433211 0020	16,40	433213 0020	17,30				
2.5	433210 0025	17,10								
3	433210 0030	17,10	433211 0030	16,40	433213 0030	17,30	433214 0030	18,55	433215 0030	22,50
3.5	433210 0035	17,10								
4	433210 0040	17,10	433211 0040	16,40	433213 0040	17,30	433214 0040	18,55	433215 0040	22,50
4.5	433210 0045	17,10								
5	433210 0050	17,10	433211 0050	16,40	433213 0050	17,30	433214 0050	18,55	433215 0050	22,50
5.5	433210 0055	17,10								
6	433210 0060	17,10	433211 0060	16,40	433213 0060	17,30	433214 0060	18,55	433215 0060	22,50
6.5	433210 0065	17,10								
7	433210 0070	17,10	433211 0070	16,40	433213 0070	17,30	433214 0070	18,55	433215 0070	22,50
8			433211 0080	16,40	433213 0080	17,30	433214 0080	18,55	433215 0080	22,50
9			433211 0090	16,40	433213 0090	17,30	433214 0090	18,55	433215 0090	22,50
10			433211 0100	16,40	433213 0100	17,30	433214 0100	18,55	433215 0100	22,50
11					433213 0110	17,30	433214 0110	18,55	433215 0110	22,50
12					433213 0120	17,30	433214 0120	18,55	433215 0120	22,50
13					433213 0130	17,30	433214 0130	18,55	433215 0130	22,50
14					433213 0140	17,30	433214 0140	18,55	433215 0140	22,50
15					433213 0150	17,30	433214 0150	18,55	433215 0150	22,50
16					433213 0160	17,30	433214 0160	18,55	433215 0160	22,50
17							433214 0170	18,55		
18							433214 0180	18,55	433215 0180	22,50
19							433214 0190	18,55		
20							433214 0200	18,55	433215 0200	22,50
21									433215 0210	22,50
22									433215 0220	22,50
25									433215 0250	22,50
26									433215 0260	22,50
		4120		4120		4120		4120		4120

### Set on a wooden stand

- ER11 = increasing in increments of 0.5 mm, ER16 - ER40 = increasing in increments of 1 mm

Designation	Contents per set	Clamping range mm	art.no.	€
ER11 4008E	13-pcs.	1 - 7	433220 1110	231,-
ER16 426E	10-pcs.	1 - 10	433220 1610	184,50
ER20 428E	12-pcs.	2 - 13	433220 2012	224,-
ER25 430E	15-pcs.	2 - 16	433220 2515	285,-
ER32 470E	18-pcs.	3 - 20	433220 3218	355,-
ER40 472E	24-pcs.	3 - 26	433220 4023	549,-

4120

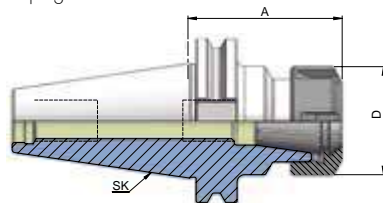


433220 1110

433220 2515

## SARA® ER collet chuck set DIN ISO 7388-1 / DIN 69871AD/AF SK40

- ER collets, DIN 6499, increasing in 1 mm increments, max. true running accuracy < 0.008 mm
- ER collet chuck, DIN ISO 7388-1 / DIN 69871AD/AF SK 40, max. true running accuracy < 0.005 mm
- Alloyed case-hardened steel with a core tensile strength of min. 950 N/mm<sup>2</sup> Case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm, burnished
- Pre-balanced to G 6.3 / 15,000 rpm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080
- Supplied in plastic case with clamping key and clamping nut



Contents per set	A mm	D mm	Collet	Clamping range mm	art.no.	€
17-pcs.	70	42	ER25	2 - 16	431103 4917	375,-
20-pcs.	70	50	ER32	3 - 20	431103 4920	435,-

4120

## SARA® Mini ER collet chuck extension

- Hardened (58 - 60 HRC) and precision-ground
- True-running accuracy, straight shank to internal taper, max. 5 µm; taper angle tolerance quality AT3
- Supplied with clamping and removal nuts

### Individual

Clamping range mm	for collets	L mm	D mm	art.no.	€
1 - 7	ER11	161	16	432000 1110	143,50
1 - 10	ER16	161	20	432000 1610	147,50
1 - 10	ER16	191	20	432000 1615	162,-
1.5 - 13	ER20	164	20	432000 2010	172,-
1.5 - 13	ER20	188	20	432000 2015	178,-

4120

### Set

- With collet chuck extension, collets, clamping nuts, key

Clamping range mm	Collet	L mm	Number of collets	art.no.	€
0.5 - 7	ER11	149	13	432100 1110	380,-
1 - 10	ER16	161	10	432100 1610	321,-
1 - 10	ER16	191	10	432100 1615	331,-
1.5 - 13	ER20	166	12	432100 2010	390,-
1.5 - 13	ER20	236	12	432100 2015	415,-

4120



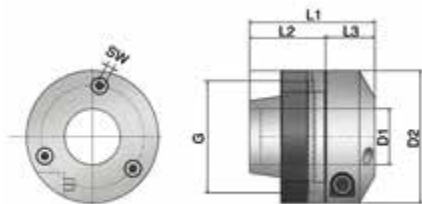
Drilling and turning ...

... with a single tool.

**ATORN®**  
Performance demands quality

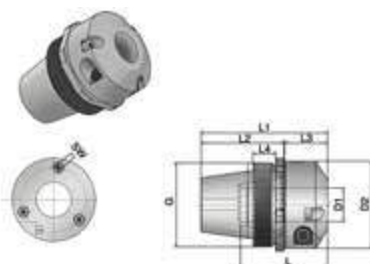
**SARA® Hydraulic expansion clamping unit ECOGRIP ER****powered by ETP**

- renders ER collet systems hydraulic
- Adjustable radial run-out
- installed correctly, a true running accuracy of 0.003 mm is achieved. The radial run-out can be further adjusted to the desired accuracy by slightly tightening the setting screws.

**For ER collet systems with external thread**

Designation	D1 mm	D2 mm	L1 mm	L2 mm	L3 mm	Thread	Wr. width mm	art.no.	€
ER16	6	34	30	16	14	M22 x 1.5	2.5	<b>433804 1006</b>	<b>230,-</b>
ER16 Mini	6	34	30	16	14	M19 x 1	2.5	433804 1106	261,-
ER20	12	43.5	40	16	24	M25 x 1.5	3	433804 2012	194,50
ER20 Mini	12	43.5	40	16	24	M24 x 1	3	433804 2112	224,-
ER25	12	48	46	20	26	M32 x 1.5	3	433804 3012	251,-
ER25	16	48	46	20	26	M32 x 1.5	3	433804 3016	220,-
ER32	20	52	52	26.5	25.5	M40 x 1.5	3	433804 4020	220,-
ER40	25	59	56	34	22	M50 x 1.5	3	433804 5020	246,-

4130

**for powered tools with ER female thread**

Designation	D1 mm	D2 mm	L mm	L1 mm	L2 mm	L3 mm	L4 mm	Thread	Wr. width mm	art.no.	€
ER20	12	16	40	60.5	36	24	10	M32 x 1.5	3	<b>433814 2512</b>	<b>288,-</b>
ER25	12	16	46	71	44.5	26	12	M40 x 1.5	3	433814 3212	288,-
ER25	16	16	46	71	44.5	26	12	M40 x 1.5	3	433814 3216	288,-
ER32	20	22	52	75.5	49.5	25.5	13.5	M50 x 1.5	3	433814 4020	327,-

4130



# ECOGRIP ER



- **Simple, quick and precise**
- **Turns your ER collet system into a hydraulic expansion chuck with adjustable true running accuracy to 0.003 mm**



Video on YouTube

## SARA® ER clamping nuts

- For collets in accordance with DIN 6499 (ER/ESX)
- Case-hardened and ground, suitable for increased speeds

### Mini nuts

- 50-54 HRC, ground on all sides
- Small constructional dimensions

suitable for	Tightening torque max. mm	Rotational speed max. r/min	D mm	L mm	Thread	art.no.	€
ER 11	18	70000	16	12	M13 x 0.75	<b>431010 1011</b>	<b>24,30</b>
ER 16	28	60000	22	18	M19 x 1	431010 1016	<b>22,90</b>
ER 20	35	50000	28	19	M24 x 1	431010 1020	<b>23,60</b>

4120



### Standard

- 56-60 HRC, pre-balanced

suitable for	Tightening torque max. mm	Rotational speed max. r/min	D mm	L mm	Thread	art.no.	€
ER 16	50	10000	32	17	M22 x 1.5	<b>431010 0016</b>	<b>21,40</b>
ER 20	75	10000	35	18.5	M25 x 1.5	431010 0020	<b>21,90</b>
ER 25	85	10000	42	20	M32 x 1.5	431010 0025	<b>22,70</b>
ER 32	105	10000	50	22.5	M40 x 1.5	431010 0032	<b>25,30</b>
ER 40	150	10000	63	25.5	M50 x 1.5	431010 0040	<b>28,70</b>

4120



### Type HP for sealing washers

- 56-60 HRC, pre-balanced
- For holding HP sealing washers,
- Operating pressure up to 80 bar

suitable for	Tightening torque max. mm	Rotational speed max. r/min	D mm	L mm	Thread	art.no.	€
ER 16	50	40000	32	22	M22 x 1.5	<b>431019 0016</b>	<b>30,80</b>
ER 25	85	35000	42	24.7	M32 x 1.5	431019 0025	<b>35,10</b>
ER 32	105	35000	50	27	M40 x 1.5	431019 0032	<b>37,30</b>
ER 40	150	25000	63	30.7	M50 x 1.5	431019 0040	<b>44,-</b>

4118



## FAHRION® Sealing washers for ER collet chucks

- For ER clamping nuts, 431019....
- For Fahrion clamping nuts **CENTRO|P (HPC-DI)** 431237....
- **Please specify shank Ø dimension in mm as four-digit figure**  
(Example HP25 DI Ø8.5 = 431021 0085)

### Bridging range -0.1 / +0.4 mm

for shank Ø mm	431020.... HP 16 Di	431021.... DI 25	431022.... HP 32 Di	431023.... HP 40 DI
	D = 12,6 mm L = 2 mm €	D = 20,2 mm L = 2 mm €	D = 26,2 mm L = 2 mm €	D = 34,2 mm L = 2 mm €
2 - 2.5	18,85	18,85	19,55	
3 - 10	15,45	15,45	16,05	19,55
10.5 - 16		15,45	16,05	19,55
17 - 20			16,05	19,55
21 - 26				19,55
	4118	4118	4118	4118



## Chuck key

- For DIN 6499 type ER clamping nuts, DIN 1804 slotted nuts and DIN 981 roller bearing nuts
- Special steel

### Standard

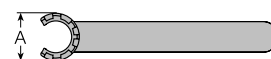
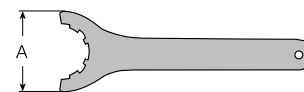
for clamping nut	A mm	art.no.	€
ER 16	50	<b>438030</b> 0016	<b>12,40</b>
ER 20	60	438030 0028	13,35
ER 25	65	438030 0042	14,15
ER 32	75	438030 0050	19,95
ER 40	90	438030 0063	26,40

4120

### Mini

for clamping nut	A mm	art.no.	€
ER 11 MINI	22.3	<b>438031</b> 0011	<b>16,-</b>
ER 16 MINI	22.5	438031 0016	16,80
ER 20 MINI	29	438031 0020	18,45

4120



## AMF Hook spanner

DIN  
1810ADIN  
1810B

- Special steel, hardened and burnished
- \* not DIN-compliant

### With milled nose, for DIN 1804 slotted nuts

- DIN 1810A

Wr. width mm	Total length mm	Thickness mm	art.no.	€
16 - 20	110	3	<b>701550</b> 0020	<b>5,30</b>
25 - 28	136	4	701550 0028	5,60
30 - 32	136	4	701550 0032	5,60
34 - 36	170	5	701550 0036	6,65
40 - 42	170	5	701550 0042	6,55
45 - 50	206	6	701550 0050	7,65
52 - 55	206	6	701550 0055	7,80
58 - 62	240	7	701550 0062	11,50
68 - 75	240	7	701550 0075	11,40
80 - 90	280	8	701550 0090	15,45
95 - 100	280	8	701550 0100	15,55
110 - 115	335	10	701550 0115	27,10
120 - 130	335	10	701550 0130	27,10
135 - 145	385	10*	701550 0145	33,50
155 - 165	385	10*	701550 0165	33,50
180 - 195	470	10*	701550 0195	54,90

4159



### With pilot tip, for capstan nuts, DIN 1816

- DIN 1810B

Wr. width mm	Pin Ø mm	Pin length mm	Total length mm	Thickness mm	art.no.	€
16 - 18	2.5	2.5	110	3	<b>701560</b> 0020	<b>5,95</b>
25 - 28	3.0	3.0	136	4	701560 0028	6,75
30 - 32	4.0	3.0	136	4	701560 0032	6,75
34 - 36	4.0	3.5	170	5	701560 0036	7,90
40 - 42	4.0	3.5	170	5	701560 0042	8,-
45 - 50	5.0	4.0	206	6	701560 0050	9,85
52 - 55	5.0	4.0	206	6	701560 0055	9,95
58 - 62	5.0	5.0	240	7	701560 0062	13,10
68 - 75	6.0	5.0	240	7	701560 0075	13,25
80 - 90	6.0	6.0	280	8	701560 0090	16,35
95 - 100	8.0	6.0	280	8	701560 0100	16,35
110 - 115	8.0	8.0	335	8*	701560 0115	28,20
120 - 130	8.0	8.0	335	8*	701560 0130	28,20
135 - 145	8.0	8.0	380	8*	701560 0145	36,70
180 - 195	10.0	8.0	470	10*	701560 0195	62,-

4159





# ATORN® Milling cutter holding fixture, DIN 6359

**DIN 6359**

- For straight shanks, DIN 1835-B (WELDON)
- Pre-balanced to G 2.5 / 25,000 rpm
- Alloyed case-hardened steel with a core tensile strength of min. 950 N/mm<sup>2</sup>
- Case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080
- Max. true running accuracy < 0.005 mm
- Supplied with clamping screw
- Additional shank designs and AD/B version available on request
- Version with coolant bores: Ø 6 to Ø 18 mm = two coolant bores, Ø 20 to Ø 40 mm = four coolant bores
- Version with coolant bores: Ø 6 to Ø 18 mm = two coolant bores Ø 20 to Ø 40 mm = four coolant bores

## DIN 69893 type A (HSK-A)

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

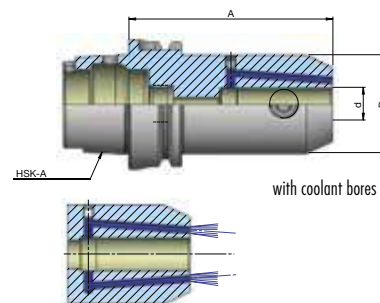
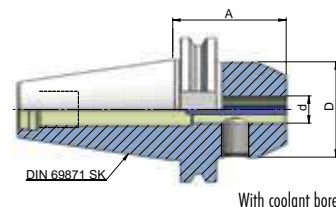
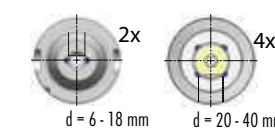
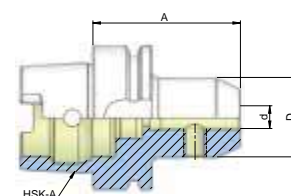
**NEW**

Shank	d mm	A mm	D mm	art.no.	€	With coolant bores		with coolant bores	
						art.no.	€	art.no.	€
HSK 50	6	65	25	434509 5006	87,-	434510 5006	97,20		
HSK 50	8	65	28	434509 5008	87,-	434510 5008	97,20		
HSK 50	10	65	35	434509 5010	87,-	434510 5010	97,20		
HSK 50	12	80	42	434509 5012	87,-	434510 5012	97,20		
HSK 50	14	80	44	434509 5014	87,-	434510 5014	97,20		
HSK 50	16	80	48	434509 5016	87,-	434510 5016	97,20		
HSK 50	18	80	50	434509 5018	87,-	434510 5018	97,20		
HSK 50	20	80	52	434509 5020	87,-	434510 5020	97,20		
HSK 63	6	65	25	434509 6306	87,-	434510 6306	97,20	434511 6306	101,-
HSK 63	6	100	25	434509 6406	102,-			434511 6406	117,50
HSK 63	6	160	25	434509 6506	136,50			434511 6506	142,50
HSK 63	8	65	28	434509 6308	87,-	434510 6308	97,20	434511 6308	101,-
HSK 63	8	100	28	434509 6408	102,-			434511 6408	117,50
HSK 63	8	160	28	434509 6508	136,50			434511 6508	142,50
HSK 63	10	65	35	434509 6310	87,-	434510 6310	97,20	434511 6310	101,-
HSK 63	10	100	35	434509 6410	102,-			434511 6410	117,50
HSK 63	10	160	35	434509 6510	136,50			434511 6510	142,50
HSK 63	12	160	42	434509 6412	136,50			434511 6512	142,50
HSK 63	12	80	42	434509 6312	87,-	434510 6312	97,20	434511 6312	101,-
HSK 63	14	80	44	434509 6314	87,-	434510 6314	97,20	434511 6314	101,-
HSK 63	14	160	44	434509 6514	136,50			434511 6514	142,50
HSK 63	16	80	48	434509 6316	87,-	434510 6316	97,20	434511 6316	101,-
HSK 63	16	160	48	434509 6416	136,50			434511 6516	142,50
HSK 63	18	80	50	434509 6318	87,-	434510 6318	97,20	434511 6318	101,-
HSK 63	18	160	50	434509 6518	136,50			434511 6518	142,50
HSK 63	20	80	52	434509 6320	87,-	434510 6320	97,20	434511 6320	101,-
HSK 63	20	160	52	434509 6420	136,50			434511 6520	142,50
HSK 63	25	110	63	434509 6325	96,20	434510 6325	107,-	434511 6325	117,50
HSK 63	32	110	72	434509 6332	101,50	434510 6332	112,-	434511 6332	122,-
HSK 63	40	125	80	434509 6340	116,-	434510 6340	126,50	434511 6340	132,50
HSK 100	6	80	25	434509 1006	121,50	434510 1006	141,50	434511 1006	134,50
HSK 100	8	80	28	434509 1008	121,50	434510 1008	141,50	434511 1008	134,50
HSK 100	10	80	35	434509 1010	121,50	434510 1010	141,50	434511 1010	134,50
HSK 100	12	80	42	434509 1012	121,50	434510 1012	141,50	434511 1012	134,50
HSK 100	14	80	44	434509 1014	121,50	434510 1014	141,50	434511 1014	134,50
HSK 100	16	100	48	434509 1016	121,50	434510 1016	141,50	434511 1016	134,50
HSK 100	18	100	50	434509 1018	121,50	434510 1018	141,50	434511 1018	134,50
HSK 100	20	100	52	434509 1020	121,50	434510 1020	141,50	434511 1020	134,50
HSK 100	25	100	65	434509 1025	140,50	434510 1025	149,50	434511 1025	151,50
HSK 100	32	100	72	434509 1032	146,50	434510 1032	154,-	434511 1032	166,-
HSK 100	40	105	80	434509 1040	159,-	434510 1040	183,50	434511 1040	176,-

4117

4117

4117



Continued on next page >>>

DIN ISO 7388-1 / DIN 69871 AD

• Internal coolant supply

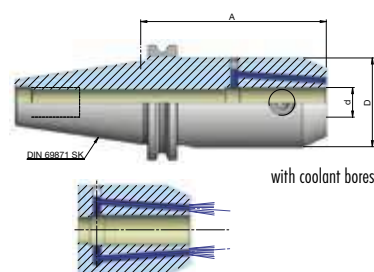
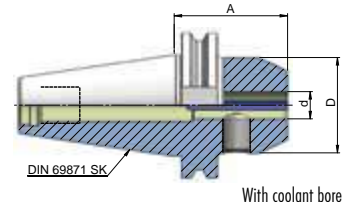
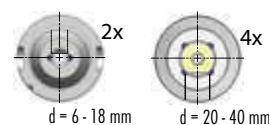
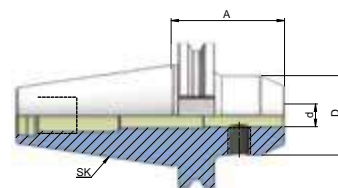
NEW

Shank	d mm	A mm	D mm	With coolant bores		with coolant bores			
				art.no.	€	art.no.	€		
SK 40	6	50	25	434503 4006	38,70	434504 4006	45,80	434505 4006	52,40
SK 40	6	100	25	434503 4106	45,80	434504 4106	55,-	434505 4106	58,50
SK 40	6	160	25	434503 4206	97,20			434505 4206	90,10
SK 40	8	50	28	434503 4008	36,70	434504 4008	43,80	434505 4008	50,40
SK 40	8	100	28	434503 4108	42,80	434504 4108	52,90	434505 4108	56,50
SK 40	8	160	28	434503 4208	89,-			434505 4208	87,50
SK 40	10	50	35	434503 4010	36,70	434504 4010	43,80	434505 4010	50,40
SK 40	10	100	35	434503 4110	42,80	434504 4110	52,90	434505 4110	56,50
SK 40	10	160	35	434503 4210	89,-			434505 4210	87,50
SK 40	12	50	42	434503 4012	36,70	434504 4012	43,80	434505 4012	50,40
SK 40	12	100	42	434503 4112	42,80	434504 4112	52,90	434505 4112	56,50
SK 40	12	160	42	434503 4212	89,-			434505 4212	87,50
SK 40	14	50	44	434503 4014	36,70	434504 4014	45,80	434505 4014	50,40
SK 40	14	100	44	434503 4114	42,80	434504 4114	57,-	434505 4114	56,50
SK 40	14	160	44	434503 4214	89,-			434505 4214	87,50
SK 40	16	35	45	434503 4216	42,40			434505 4016	56,50
SK 40	16	63	48	434503 4016	36,70	434504 4016	45,80	434505 4116	50,40
SK 40	16	100	48	434503 4116	42,80	434504 4116	57,-	434505 4216	56,50
SK 40	16	160	48	434503 4316	89,-			434505 4316	87,50
SK 40	18	63	50	434503 4018	36,70	434504 4018	45,80	434505 4018	50,40
SK 40	18	100	50	434503 4118	42,80	434504 4118	57,-	434505 4118	56,50
SK 40	18	160	50	434503 4218	89,-			434505 4218	87,50
SK 40	20	35	45	434503 4220	42,40			434505 4020	56,50
SK 40	20	63	52	434503 4020	36,70	434504 4020	45,80	434505 4120	50,40
SK 40	20	100	52	434503 4120	42,80	434504 4120	57,-	434505 4220	56,50
SK 40	20	160	52	434503 4320	89,-			434505 4320	87,50
SK 40	25	35	50	434503 4225	48,60				
SK 40	25	100	63	434503 4025	42,80	434504 4025	59,-	434505 4125	56,50
SK 40	25	160	63	434503 4325	97,20			434505 4225	92,60
SK 40	32	65	50	434503 4232	57,-				
SK 40	32	100	72	434503 4032	44,80	434504 4032	60,10	434505 4132	58,50
SK 40	32	160	72	434503 4332	101,50			434505 4232	98,70
SK 40	40	120	80	434503 4040	57,-	434504 4040	63,10	434505 4140	72,30
SK 50	6	63	25	434503 5006	55,-	434504 5006	69,20	434505 5006	72,30
SK 50	6	100	25	434503 5106	65,10			434505 5106	82,40
SK 50	6	160	25	434503 5206	132,50			434505 5206	97,70
SK 50	8	63	28	434503 5008	52,90	434504 5008	67,20	434505 5008	70,20
SK 50	8	100	28	434503 5108	63,10			434505 5108	79,40
SK 50	8	160	28	434503 5208	125,50			434505 5208	96,70
SK 50	10	63	35	434503 5010	52,90	434504 5010	67,20	434505 5010	70,20
SK 50	10	100	35	434503 5110	63,10			434505 5110	79,40
SK 50	10	160	35	434503 5210	125,50			434505 5210	96,70
SK 50	12	63	42	434503 5012	52,90	434504 5012	67,20	434505 5012	70,20
SK 50	12	100	42	434503 5112	63,10			434505 5112	79,40
SK 50	12	160	42	434503 5212	125,50			434505 5212	96,70
SK 50	14	63	44	434503 5014	52,90	434504 5014	67,20	434505 5014	70,20
SK 50	14	100	44	434503 5114	63,10			434505 5114	79,40
SK 50	14	160	44	434503 5214	125,50			434505 5214	96,70
SK 50	16	63	48	434503 5016	52,90	434504 5016	67,20	434505 5016	70,20
SK 50	16	100	48	434503 5116	63,10			434505 5116	79,40
SK 50	16	160	48	434503 5216	125,50			434505 5216	96,70
SK 50	18	63	50	434503 5018	52,90	434504 5018	67,20	434505 5018	70,20
SK 50	18	100	50	434503 5118	63,10			434505 5118	79,40
SK 50	18	160	50	434503 5218	125,50			434505 5218	96,70
SK 50	20	63	52	434503 5020	52,90	434504 5020	67,20	434505 5020	70,20
SK 50	20	100	52	434503 5120	63,10			434505 5120	79,40
SK 50	20	160	52	434503 5220	125,50			434505 5220	96,70
SK 50	25	80	65	434503 5025	59,-	434504 5025	73,30	434505 5025	77,30
SK 50	25	120	65	434503 5125	82,40			434505 5125	89,50

4117

4117

4117



**NEW**

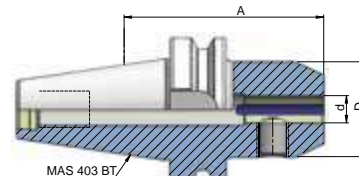
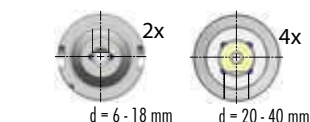
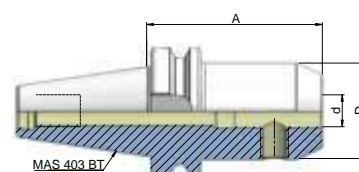
Shank	d mm	A mm	D mm	art.no.	€	With coolant bores art.no.	€	with coolant bores art.no.	€
SK 50	25	160	65	434503 5225	99,20			434505 5225	96,70
SK 50	32	100	72	434503 5032	63,10	434504 5032	74,30	434505 5032	79,40
SK 50	32	160	72	434503 5132	145,50			434505 5132	96,70
SK 50	40	100	80	434503 5040	68,20	434504 5040	77,30	434505 5040	82,40
SK 50	40	160	80	434503 5140	108,-			434505 5140	101,-
				4117		4117		4117	

**DIN ISO 7388-2 / MAS BT JIS B 6339**

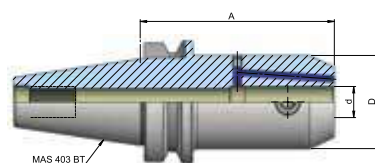
• Internal coolant supply

**NEW**

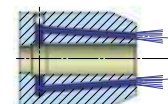
Shank	d mm	A mm	D mm	art.no.	€	With coolant bores art.no.	€	with coolant bores art.no.	€
BT 40	6	50	25	434507 4006	38,70	434508 4006	45,80	434518 4006	55,-
BT 40	6	100	25	434507 4106	45,80			434518 4106	60,10
BT 40	6	160	25	434507 4306	83,40			434518 4206	92,60
BT 40	8	50	28	434507 4008	36,70	434508 4008	43,80	434518 4008	52,90
BT 40	8	100	28	434507 4108	42,80			434518 4108	59,-
BT 40	8	160	28	434507 4308	80,40			434518 4208	88,50
BT 40	10	63	35	434507 4010	36,70	434508 4010	43,80	434518 4010	52,90
BT 40	10	100	35	434507 4110	42,80			434518 4110	59,-
BT 40	10	160	35	434507 4310	80,40			434518 4210	88,50
BT 40	12	63	42	434507 4012	36,70	434508 4012	43,80	434518 4012	52,90
BT 40	12	100	42	434507 4112	42,80			434518 4112	59,-
BT 40	12	160	42	434507 4312	80,40			434518 4212	88,50
BT 40	14	63	44	434507 4014	36,70	434508 4014	45,80	434518 4014	52,90
BT 40	14	100	44	434507 4114	42,80			434518 4114	59,-
BT 40	16	35	45	434507 4216	42,80				
BT 40	16	63	48	434507 4016	36,70	434508 4016	45,80	434518 4016	52,90
BT 40	16	100	48	434507 4116	42,80			434518 4116	59,-
BT 40	16	160	48	434507 4316	80,40			434518 4216	88,50
BT 40	18	63	50	434507 4018	36,70	434508 4018	45,80	434518 4018	52,90
BT 40	18	100	50	434507 4118	42,80			434518 4118	59,-
BT 40	20	35	45	434507 4220	42,80				
BT 40	20	63	52	434507 4020	36,70	434508 4020	45,80	434518 4020	52,90
BT 40	20	100	52	434507 4120	42,80			434518 4120	59,-
BT 40	20	160	52	434507 4320	80,40			434518 4220	88,50
BT 40	25	35	45	434507 4225	48,90				
BT 40	25	90	63	434507 4025	40,70	434508 4025	59,-	434518 4025	59,-
BT 40	25	160	63	434507 4325	87,-			434518 4325	94,60
BT 40	32	65	62	434507 4232	52,90				
BT 40	32	100	72	434507 4032	44,80	434508 4032	60,10	434518 4032	60,10
BT 40	32	160	72	434507 4332	95,10			434518 4332	101,-
BT 40	40	120	80	434507 4040	57,-	434508 4040	69,20	434518 4040	73,30
BT 50	6	63	25	434507 5006	61,10	434508 5006	69,20		
BT 50	8	63	28	434507 5008	59,-	434508 5008	67,20		
BT 50	10	63	35	434507 5010	59,-	434508 5010	67,20		
BT 50	10	100	35	434507 5110	76,30				
BT 50	12	80	42	434507 5012	59,-	434508 5012	67,20		
BT 50	12	100	42	434507 5112	76,30				
BT 50	14	80	44	434507 5014	59,-	434508 5014	67,20		
BT 50	16	80	48	434507 5016	59,-	434508 5016	67,20		
BT 50	16	100	48	434507 5116	76,30				
BT 50	18	80	50	434507 5018	59,-	434508 5018	67,20		
BT 50	20	80	52	434507 5020	59,-	434508 5020	67,20		
BT 50	20	100	52	434507 5120	76,30				
BT 50	25	100	65	434507 5025	64,10	434508 5025	74,30		
BT 50	25	160	65	434507 5325	145,50				
BT 50	32	105	72	434507 5032	68,20	434508 5032	79,40		
BT 50	32	160	72	434507 5332	123,50				
BT 50	40	110	80	434507 5040	75,30	434508 5040	87,-		
				4117		4117		4117	



With coolant bore



with coolant bores

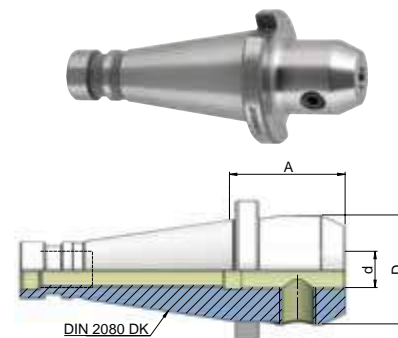


Continued on next page >>>

**DIN 2080**

Shank	d mm	A mm	D mm	art.no.	€
SK 40	6	50	25	<b>434501 4006</b>	<b>37,70</b>
SK 40	8	50	28	434501 4008	35,60
SK 40	10	50	35	434501 4010	35,60
SK 40	12	50	42	434501 4012	35,60
SK 40	14	50	44	434501 4014	35,60
SK 40	16	63	48	434501 4016	35,60
SK 40	18	63	50	434501 4018	35,60
SK 40	20	63	52	434501 4020	35,60
SK 40	25	80	63	434501 4025	39,70
SK 40	32	80	72	434501 4032	44,80
SK 40	40	90	80	434501 4040	56,-
SK 50	6	63	25	434501 5006	54,-
SK 50	8	63	28	434501 5008	51,90
SK 50	10	63	35	434501 5010	51,90
SK 50	12	63	42	434501 5012	51,90
SK 50	14	63	44	434501 5014	51,90
SK 50	16	63	48	434501 5016	51,90
SK 50	18	63	50	434501 5018	51,90
SK 50	20	63	52	434501 5020	51,90
SK 50	25	80	65	434501 5025	58,-
SK 50	32	80	72	434501 5032	62,10
SK 50	40	90	80	434501 5040	68,20

4117

**Clamping screws for milling cutter holding fixtures, DIN 6359****Weldon clamping screws, DIN 1835 B**

- For clamping DIN 1835 B straight shanks in DIN 6359/1835 Part 2 - 3 milling cutter arbours (Weldon jaw chuck)
- For standard and long chuck designs
- Clamping screws for short chuck versions ( $\varnothing 16 / 20 / 25 A = 35$  mm,  $\varnothing 32 A = 65$  mm) available on request

Thread	L mm	for $\varnothing$ mm	art.no.	€
M10	12	10	<b>431012 0010</b>	<b>3,06</b>
M12	16	12	431012 0012	5,10
M14	16	16	431012 0014	5,10
M16	16	20	431012 0016	5,10
M18x2	20	25	431012 0025	12,25
M20x2	20	32+40	431012 0032	12,25
M6	10	6	431012 0006	3,06
M8	10	8	431012 0008	3,06

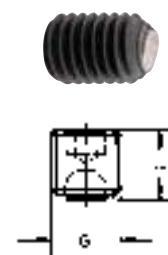
4117

**Whistle-notch clamping screws, DIN 1835 E**

- Version with ball
- For clamping DIN 1835 E straight shanks (with suitable clamping surface) in DIN 6359/1835 Part 2 - 3 milling cutter arbours (Weldon jaw chuck)
- Clamping screws for short chuck versions ( $\varnothing 16/20/25 A = 35$  mm,  $\varnothing 32 A = 65$  mm) available on request

Thread	L mm	for $\varnothing$ mm	art.no.	€
M 6	10	6	<b>431013 0006</b>	<b>8,55</b>
M 8	10	8	431013 0008	9,55
M10	12	10	431013 0010	10,50
M12	16	12 + 14	431013 0012	12,40
M14	16	16 + 18	431013 0014	14,75
M16	16	20	431013 0016	15,25
M18x2	20	25	431013 0018	19,05
M20x2	20	32 + 40	431013 0020	21,-

4117



## ATORN® Shell-type milling cutter arbour with transverse slot

**DIN  
6357**

- with enlarged collar diameter and coolant mounts
- pre-balanced G 2.5 / 25,000 rpm
- alloyed case-hardened steel, tensile strength at core min. 950 N/mm<sup>2</sup>
- case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8mm ± 0.2mm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080
- max. True running accuracy < 0.005mm
- Supplied with carrier blocks and milling cutter retaining screw
- **Additional shank designs and AD/AF version available on request**

### DIN 69893 type A (HSK-A)

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used
- \* = Also with four DIN 2079-compliant threaded bores for holding cutter heads

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
HSK 50	16	50	38	17	<b>435309 5016</b>	<b>100,50</b>
HSK 50	22	60	48	19	435309 5022	100,50
HSK 50	27	60	58	21	435309 5027	104,-
HSK 50	32	60	78	24	435309 5032	143,50
HSK 63	16	50	38	17	435309 6316	108,-
HSK 63	16	100	38	17	435309 6416	128,50
HSK 63	16	160	38	17	435309 6516	180,50
HSK 63	22	50	48	19	435309 6322	108,-
HSK 63	22	100	48	19	435309 6422	128,50
HSK 63	22	160	48	19	435309 6522	180,50
HSK 63	27	60	58	21	435309 6327	116,-
HSK 63	27	100	58	21	435309 6427	136,50
HSK 63	27	160	58	21	435309 6527	180,50
HSK 63	32	60	78	24	435309 6332	120,50
HSK 63	32	100	78	24	435309 6432	140,50
HSK 63	32	160	78	24	435309 6532	195,50
HSK 63	*	40	60	88	435309 6340	134,50
HSK 63	*	40	100	88	435309 6440	144,-
HSK 63	*	40	160	88	435309 6540	209,-
HSK 100	16	50	38	17	435309 1016	136,50
HSK 100	16	100	38	17	435309 1116	169,-
HSK 100	16	160	38	17	435309 1216	245,-
HSK 100	22	50	48	19	435309 1022	136,50
HSK 100	22	100	48	19	435309 1122	169,-
HSK 100	22	160	48	19	435309 1222	245,-
HSK 100	27	50	58	21	435309 1027	141,50
HSK 100	27	100	58	21	435309 1127	172,-
HSK 100	27	160	58	21	435309 1227	250,-
HSK 100	32	50	78	24	435309 1032	152,-
HSK 100	32	100	78	24	435309 1132	181,50
HSK 100	32	160	78	24	435309 1232	265,-
HSK 100	*	40	60	88	435309 1040	157,-
HSK 100	*	40	100	88	435309 1140	196,50

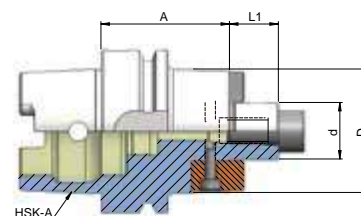
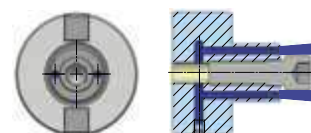
4117

### DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply
- \* = Also with four DIN 2079-compliant threaded bores for holding cutter heads

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
SK 40	16	35	38	17	<b>435303 4016</b>	<b>49,90</b>
SK 40	16	100	38	17	435303 4116	61,10
SK 40	16	160	38	17	435303 4216	86,50
SK 40	22	35	48	19	435303 4022	49,90
SK 40	22	100	48	19	435303 4122	61,10
SK 40	22	160	48	19	435303 4222	86,50
SK 40	27	40	58	21	435303 4027	50,90
SK 40	27	100	58	21	435303 4127	62,10

4117



Continued on next page &gt;&gt;&gt;

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
SK 40	27	160	58	21	435303 4227	97,70
SK 40	32	50	78	24	435303 4032	54,-
SK 40	32	100	78	24	435303 4132	66,20
SK 40	32	160	78	24	435303 4232	94,10
SK 40	*	40	50	88	435303 4040	65,10
SK 40	*	40	160	88	435303 4240	122,-
SK 50	16	35	38	17	435303 5016	65,10
SK 50	16	100	38	17	435303 5116	79,40
SK 50	16	160	38	17	435303 5216	112,50
SK 50	22	35	48	19	435303 5022	65,10
SK 50	22	100	48	19	435303 5122	79,40
SK 50	22	160	48	19	435303 5222	112,50
SK 50	27	40	58	21	435303 5027	65,10
SK 50	27	100	58	21	435303 5127	79,40
SK 50	27	160	58	21	435303 5227	112,50
SK 50	32	50	78	24	435303 5032	69,20
SK 50	32	100	78	24	435303 5132	84,50
SK 50	32	160	78	24	435303 5232	119,50
SK 50	*	40	50	88	435303 5040	79,40
SK 50	*	40	100	88	435303 5140	98,20
SK 50	*	40	160	88	435303 5240	112,50

4117

**DIN ISO 7388-2 / MAS BT JIS B 6339**

- Internal coolant supply
- \* = Also with four DIN 2079-compliant threaded bores for holding cutter heads

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
BT 40	16	40	38	17	<b>435307</b> 4016	49,90
BT 40	16	100	38	17	435307 4116	60,10
BT 40	16	160	38	17	435307 4216	86,50
BT 40	22	40	48	19	435307 4022	49,90
BT 40	22	100	48	19	435307 4122	60,10
BT 40	22	160	48	19	435307 4222	86,50
BT 40	27	40	58	21	435307 4027	50,90
BT 40	27	100	58	21	435307 4127	60,10
BT 40	27	160	58	21	435307 4227	86,50
BT 40	32	50	78	24	435307 4032	54,-
BT 40	32	100	78	24	435307 4132	65,10
BT 40	32	160	78	24	435307 4232	94,10
BT 40	*	40	50	88	435307 4040	65,10
BT 40	*	40	100	88	435307 4140	77,30
BT 40	*	40	160	88	435307 4240	112,50
BT 50	22	55	48	19	435307 5022	72,30
BT 50	27	55	58	21	435307 5027	72,30
BT 50	32	55	78	24	435307 5032	76,30
BT 50	*	40	55	88	435307 5040	87,-

4117

**DIN 2080**

- \* = Also with four DIN 2079-compliant threaded bores for holding cutter heads

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
SK 40	16	30	38	17	<b>435301</b> 4016	48,90
SK 40	22	30	48	19	435301 4022	48,90
SK 40	27	30	58	21	435301 4027	49,90
SK 40	32	30	78	24	435301 4032	52,90
SK 40	*	40	30	88	435301 4040	64,10
SK 50	22	35	48	19	435301 5022	64,10
SK 50	27	35	58	21	435301 5027	64,10
SK 50	32	40	78	24	435301 5032	69,20
SK 50	*	40	33	88	435301 5040	78,40

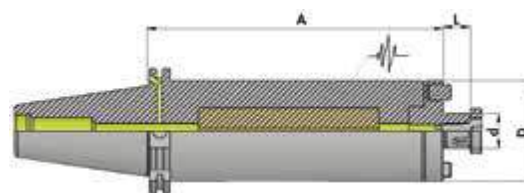
4117





**ATORN® Transverse slot shell-type milling arbour, vibration-dampened****NEW**

- Pre-balanced to G 2.5 / 25,000 rpm
- Vibration-dampened due to mounted heavy metal core
- Shank hard overturned for corrosion protection and improved smooth running
- Straight version
- With coolant bores and enlarged contact surface
- All functional surfaces – such as taper, contact surface and holding pin – ground
- Milling cutter retaining screw with INBUS screw and fine thread ring for increased clamp force
- Increased working safety thanks to pressed-in driving pin without detachable screws

**DIN 69893 ISO 12164-1 (HSK-A)**

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe art.no. 431011.... should be used

Shank	A mm	L mm	d mm	D mm	art.no.	€
HSK-A 63	200	17	16	38	<b>435339 6216</b>	<b>689,-</b>
HSK-A 63	300	17	16	38	435339 6316	789,-
HSK-A 63	200	19	22	48	435339 6222	689,-
HSK-A 63	300	19	22	48	435339 6322	789,-
HSK-A 63	200	21	27	58	435339 6227	689,-
HSK-A 100	200	17	16	38	435339 1216	799,-
HSK-A 100	300	17	16	38	435339 1316	839,-
HSK-A 100	400	17	16	38	435339 1416	889,-
HSK-A 100	200	19	22	48	435339 1222	799,-
HSK-A 100	300	19	22	48	435339 1322	839,-
HSK-A 100	400	19	22	48	435339 1422	889,-
HSK-A 100	200	21	27	58	435339 1227	799,-
HSK-A 100	300	21	27	58	435339 1327	839,-
HSK-A 100	400	21	27	58	435339 1427	889,-
HSK-A 100	300	24	32	78	435339 1332	839,-

4123

**DIN 69871 ISO 7388-1 (SK)**

- Internal coolant supply

Shank	A mm	L mm	d mm	D mm	art.no.	€
SK 40	200	17	16	38	<b>435333 4216</b>	<b>559,-</b>
SK 40	300	17	16	38	435333 4316	639,-
SK 40	200	19	22	48	435333 4222	559,-
SK 40	300	19	22	48	435333 4322	639,-
SK 40	200	21	27	58	435333 4227	559,-
SK 50	200	17	16	38	435333 5216	649,-
SK 50	300	17	16	38	435333 5316	729,-
SK 50	400	17	16	38	435333 5416	759,-
SK 50	200	19	22	48	435333 5222	649,-
SK 50	300	19	22	48	435333 5322	729,-
SK 50	400	19	22	48	435333 5422	759,-
SK 50	200	21	27	58	435333 5227	649,-
SK 50	300	21	27	58	435333 5327	729,-
SK 50	400	21	27	58	435333 5427	759,-
SK 50	300	24	32	78	435333 5332	729,-

4123



Continued on next page &gt;&gt;&gt;



**JIS B 6339 ISO 7388-2 (BT)**

- Internal coolant supply

Shank	A mm	L mm	d mm	D mm	art.no.	€
BT 40	200	17	16	38	<b>435337 4216</b>	<b>559,-</b>
BT 40	300	17	16	38	435337 4316	639,-
BT 40	200	19	22	48	435337 4222	559,-
BT 40	300	19	22	48	435337 4322	639,-
BT 40	200	21	27	58	435337 4227	559,-
BT 50	200	17	16	38	435337 5216	649,-
BT 50	300	17	16	38	435337 5316	729,-
BT 50	400	17	16	38	435337 5416	759,-
BT 50	200	19	22	48	435337 5222	649,-
BT 50	300	19	22	48	435337 5322	729,-
BT 50	400	19	22	48	435337 5422	759,-
BT 50	200	21	27	58	435337 5227	649,-
BT 50	300	21	27	58	435337 5327	729,-
BT 50	400	21	27	58	435337 5427	759,-
BT 50	300	24	32	78	435337 5332	729,-

4123

**Carrier blocks**

- For shell-type milling cutter arbours with transverse slots
- With screw



for gauge Ø mm	B mm	H mm	L mm	art.no.	€
16	8	10	10	<b>438026 0016</b>	<b>10,35</b>
22	10	11	11	438026 0022	10,35
27	12	13	14	438026 0027	16,30
32	14	14	22	438026 0032	16,30
40	16	16	23	438026 0040	20,70

4117

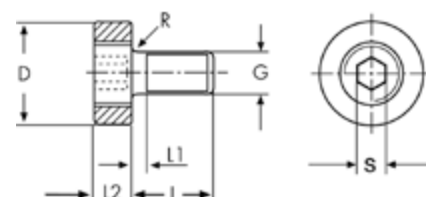
**Cutter retaining screw for milling cutter arbours**

- For milling cutter arbours, holding fixtures for cutter heads and milling cutters with transverse slots
- The different pitches of the two threads on the threaded bolt create a strong locking effect. The milling cutter is securely clamped without a major exertion of force, tube extensions or hammer blows.



for gauge Ø mm	D mm	L mm	L1 mm	L2 mm	R mm	S mm	Thread	art.no.	€
16	20	16	3	7	1.6	5	M 8	<b>438010 0008</b>	<b>8,25</b>
22	28	18	3.6	8	2	6	M10	438010 0010	9,80
27	35	22	4.5	9	2.5	8	M12	438010 0012	14,35
32	42	26	5.5	10	3	10	M16	438010 0016	19,85
40	52	30	6	11	3	12	M20	438010 0020	30,60
50	63	36	7.5	13	4	14	M24	438010 0024	42,80

4117



## ATORN® Combination shell-type milling cutter arbour

**DIN  
6358**

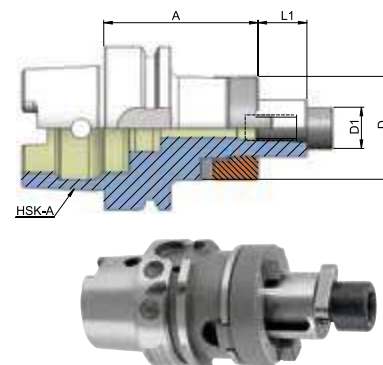
- For milling cutters with longitudinal or transverse slots
- Pre-balanced to **G 2.5 / 25,000 rpm**
- Alloyed case-hardened steel, core tensile strength min. 950 N/mm<sup>2</sup>
- Case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080
- Max. true running accuracy < 0.005 mm
- Delivery incl. fitting key, follower ring and **tightening bolt without coolant bore**
- **Additional shank designs and AD/B versions available on request**

### DIN 69893 type A (HSK-A)

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
HSK-A 50	16	50	32	17	<b>434909 5016</b>	<b>95,10</b>
HSK-A 50	22	50	40	19	434909 5022	<b>97,20</b>
HSK-A 50	27	65	48	21	434909 5027	<b>101,50</b>
HSK-A 50	32	65	58	24	434909 5032	<b>108,-</b>
HSK-A 63	16	60	32	17	434909 6316	<b>97,20</b>
HSK-A 63	16	100	32	17	434909 6416	<b>106,-</b>
HSK-A 63	22	60	40	19	434909 6322	<b>97,20</b>
HSK-A 63	22	100	40	19	434909 6422	<b>106,-</b>
HSK-A 63	27	60	48	21	434909 6327	<b>106,-</b>
HSK-A 63	27	100	48	21	434909 6427	<b>114,-</b>
HSK-A 63	32	60	58	24	434909 6332	<b>110,-</b>
HSK-A 63	32	100	58	24	434909 6432	<b>118,-</b>
HSK-A 63	40	60	70	27	434909 6340	<b>114,-</b>
HSK-A 63	40	100	70	27	434909 6440	<b>122,50</b>
HSKA 100	16	60	32	17	434909 1016	<b>129,50</b>
HSKA 100	22	60	40	19	434909 1022	<b>129,50</b>
HSKA 100	27	60	48	21	434909 1027	<b>134,50</b>
HSKA 100	32	60	58	24	434909 1032	<b>144,50</b>
HSKA 100	40	70	70	27	434909 1040	<b>149,50</b>

4117



### DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply
- **A = 160 and 200 mm incl. coolant bores for cutter heads with internal coolant supply**

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
SK 40	16	55	32	17	<b>434903 4016</b>	<b>44,80</b>
SK 40	16	100	32	17	434903 4116	<b>57,-</b>
SK 40	16	160	32	17	434903 4216	<b>112,-</b>
SK 40	22	55	40	19	434903 4022	<b>45,80</b>
SK 40	22	100	40	19	434903 4122	<b>58,-</b>
SK 40	22	160	40	19	434903 4222	<b>116,-</b>
SK 40	27	55	48	21	434903 4027	<b>45,80</b>
SK 40	27	100	48	21	434903 4127	<b>59,-</b>
SK 40	27	160	48	21	434903 4227	<b>121,50</b>
SK 40	32	60	58	24	434903 4032	<b>50,90</b>
SK 40	32	100	58	24	434903 4132	<b>61,10</b>
SK 40	32	160	58	24	434903 4232	<b>128,50</b>
SK 40	40	60	70	27	434903 4040	<b>58,-</b>
SK 50	16	55	32	17	434903 5016	<b>62,10</b>
SK 50	16	100	32	17	434903 5116	<b>73,30</b>
SK 50	16	160	32	17	434903 5216	<b>137,50</b>
SK 50	16	200	32	17	434903 5316	<b>164,-</b>
SK 50	22	55	40	19	434903 5022	<b>62,10</b>
SK 50	22	100	40	19	434903 5122	<b>73,30</b>

4117



Continued on next page &gt;&gt;&gt;

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
SK 50	22	160	40	19	434903 5222	140,50
SK 50	22	200	40	19	434903 5322	170,-
SK 50	27	55	48	21	434903 5027	63,10
SK 50	27	100	48	21	434903 5127	74,30
SK 50	27	160	48	21	434903 5227	145,50
SK 50	27	200	48	21	434903 5327	176,-
SK 50	32	55	58	24	434903 5032	65,10
SK 50	32	100	58	24	434903 5132	75,30
SK 50	32	160	58	24	434903 5232	155,-
SK 50	32	200	58	24	434903 5332	187,50
SK 50	40	55	70	27	434903 5040	72,30
SK 50	40	100	70	27	434903 5140	81,40
SK 50	40	160	70	27	434903 5240	169,-
SK 50	40	200	70	27	434903 5340	196,50

4117

**DIN ISO 7388-2 / MAS BT JIS B 6339**

Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
BT 40	16	55	32	17	<b>434907</b> 4016	44,80
BT 40	16	100	32	17	434907 4116	57,-
BT 40	22	55	40	19	434907 4022	45,80
BT 40	22	100	40	19	434907 4122	58,-
BT 40	27	55	48	21	434907 4027	45,80
BT 40	27	100	48	21	434907 4127	59,-
BT 40	32	60	58	24	434907 4032	50,90
BT 40	32	100	58	24	434907 4132	61,10
BT 40	40	60	70	27	434907 4040	58,-
BT 50	16	70	32	17	434907 5016	62,10
BT 50	22	70	40	19	434907 5022	62,10
BT 50	27	70	48	21	434907 5027	63,10
BT 50	32	70	58	24	434907 5032	65,10
BT 50	40	70	70	27	434907 5040	72,30

4117

**DIN 2080**

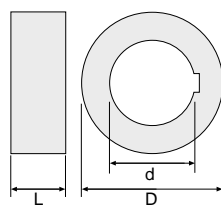
Shank	D1 mm	A mm	D mm	L1 mm	art.no.	€
SK 40	16	52	32	17	<b>434901</b> 4016	44,80
SK 40	22	52	40	19	434901 4022	45,80
SK 40	27	52	48	21	434901 4027	45,80
SK 40	32	52	58	24	434901 4032	49,90
SK 40	40	52	70	27	434901 4040	57,-
SK 50	16	55	32	17	434901 5016	61,10
SK 50	22	55	40	19	434901 5022	61,10
SK 50	27	55	48	21	434901 5027	62,10
SK 50	32	55	58	24	434901 5032	64,10
SK 50	40	55	70	27	434901 5040	71,20

4117



**SARA® Form B spacing collars****DIN  
2084**

- Alloyed case-hardened steel, turned and ground, hardened (min. 52 HRC)
- Width parallelism tolerance is IT3 in relation to the bore



d mm	D mm	L mm	art.no.	€
16	27	2	<b>434922 2002</b>	<b>9,25</b>
16	27	3	434922 2003	<b>9,25</b>
16	27	4	434922 2004	<b>9,70</b>
16	27	5	434922 2005	<b>10,05</b>
16	27	6	434922 2006	<b>10,25</b>
16	27	10	434922 2010	<b>14,45</b>
16	27	20	434922 2020	<b>18,25</b>
16	27	30	434922 2030	<b>22,70</b>
22	34	2	434922 3002	<b>9,70</b>
22	34	3	434922 3003	<b>10,05</b>
22	34	4	434922 3004	<b>10,60</b>
22	34	5	434922 3005	<b>11,15</b>
22	34	6	434922 3006	<b>12,20</b>
22	34	10	434922 3010	<b>16,60</b>
22	34	20	434922 3020	<b>21,20</b>
22	34	30	434922 3030	<b>28,-</b>
22	34	60	434922 3060	<b>41,80</b>
22	34	100	434922 3100	<b>61,60</b>
27	41	2	434922 4002	<b>10,25</b>
27	41	3	434922 4003	<b>10,60</b>
27	41	4	434922 4004	<b>12,20</b>
27	41	5	434922 4005	<b>12,90</b>
27	41	6	434922 4006	<b>14,10</b>
27	41	10	434922 4010	<b>17,10</b>

4109

d mm	D mm	L mm	art.no.	€
27	41	20	434922 4020	<b>23,50</b>
27	41	30	434922 4030	<b>32,80</b>
27	41	60	434922 4060	<b>50,10</b>
27	41	100	434922 4100	<b>77,90</b>
32	47	2	434922 5002	<b>11,60</b>
32	47	3	434922 5003	<b>13,55</b>
32	47	4	434922 5004	<b>14,10</b>
32	47	5	434922 5005	<b>14,65</b>
32	47	6	434922 5006	<b>15,70</b>
32	47	10	434922 5010	<b>21,10</b>
32	47	20	434922 5020	<b>29,70</b>
32	47	30	434922 5030	<b>36,-</b>
32	47	60	434922 5060	<b>58,-</b>
32	47	100	434922 5100	<b>90,60</b>
40	55	2	434922 6002	<b>15,10</b>
40	55	3	434922 6003	<b>15,10</b>
40	55	4	434922 6004	<b>17,90</b>
40	55	5	434922 6005	<b>18,85</b>
40	55	6	434922 6006	<b>20,40</b>
40	55	10	434922 6010	<b>26,30</b>
40	55	20	434922 6020	<b>36,60</b>
40	55	30	434922 6030	<b>44,70</b>
40	55	60	434922 6060	<b>73,30</b>
40	55	100	434922 6100	<b>112,-</b>

4109



# Metal saw blades

**Page 425**

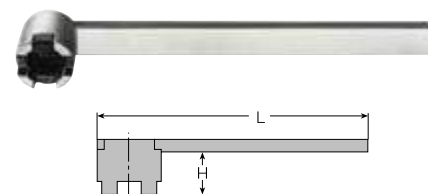
## AMF Key for shell-type milling cutter arbours

**DIN 6368**

- For tightening DIN 6367 retaining screws
- Special steel hardened and tempered to a burnished shade

for gauge Ø mm	Thread	H mm	L mm	art.no.	€
16	M8	20	180	<b>438005 0016</b>	<b>15,90</b>
22	M10	25	200	438005 0022	19,25
27	M12	32	225	438005 0027	22,30
32	M16	36	250	438005 0032	29,70
40	M20	40	280	438005 0040	39,-
50	M24	45	315	438005 0050	74,50

4159



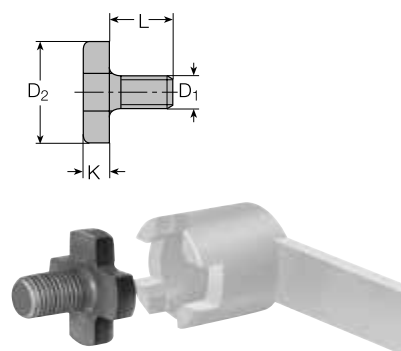
## Cutter retaining screw for shell-type milling cutter arbours

**DIN 6367**

D1 mm	for gauge Ø mm	D2 mm	K mm	L mm	Standard art.no.	€	For internal cooling art.no.	€
M8	16	20	6	16	<b>438001 0008</b>	<b>6,35</b>	<b>438002 0008</b>	<b>12,45</b>
M10	22	28	7	18	438001 0010	7,75	438002 0010	12,45
M12	27	35	8	22	438001 0012	9,10	438002 0012	13,80
M16	32	42	9	26	438001 0016	13,25	438002 0016	23,50
M20	40	52	10	30	438001 0020	17,80		
M24	50	63	12	36	438001 0024	28,70		

4117

4117



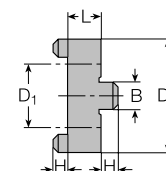
## Follower rings

**DIN 6366**

- For shell-type milling cutter arbours

D1 mm	L mm	D3 mm	B mm	H mm	art.no.	€
16	10	32	8	5	<b>438020 0016</b>	<b>13,30</b>
22	12	40	10	5.6	438020 0022	16,30
27	12	48	12	6.3	438020 0027	16,30
32	14	58	14	7	438020 0032	20,70
40	14	70	16	8	438020 0040	30,90

4117



## Fitting keys

- For combination shell-type milling cutter arbours

for gauge Ø mm	B mm	H mm	L mm	art.no.	€
16	4	4	20	<b>438025 0016</b>	<b>5,90</b>
22	6	6	25	438025 0022	5,90
27	7	7	25	438025 0027	5,90
32	8	7	28	438025 0032	5,90
40	10	8	32	438025 0040	5,90

4117



## ATORN® Boring bar blanks

- Steep-angle taper and collar case-hardened to HRC 60 ± 2 (HV 700 ± 50) and ground
- Soft shank for further machining

### DIN ISO 7388-1 / DIN 69871 A

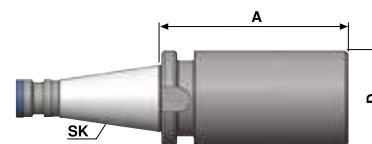
Shank	A mm	D mm	art.no.	€
SK 40	250	63	431002 4063	89,-
SK 50	315	97	431002 5097	147,50

4117

### DIN 2080

Shank	A mm	D mm	art.no.	€
SK 40	250	63	431000 4063	97,70
SK 50	315	97	431000 5097	161,-

4117



## ATORN® Adapter sleeves for Morse tapers with tangs

**DIN  
6383**

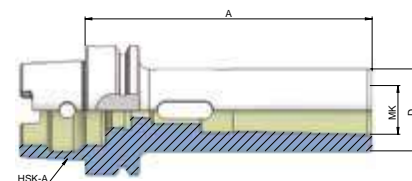
- Alloyed case-hardened steel, core tensile strength min. 950 N/mm<sup>2</sup>
- **Pre-balanced to G 2.5 / 25,000 rpm**
- Case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm, burnished
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080
- Max. true running accuracy < 0.005 mm
- Additional versions available on request

### DIN 69893 type A (HSK-A)

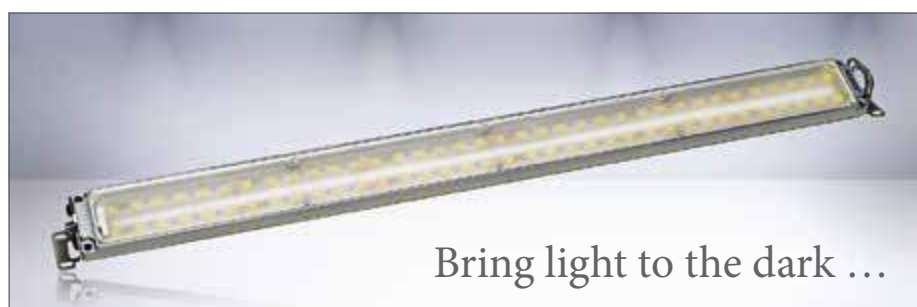
- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	Shank design interior	A mm	D mm	art.no.	€
HSK-A 50	MT 1	100	25	433509 5001	81,40
HSK-A 50	MT 2	120	32	433509 5002	81,40
HSK-A 50	MT3	140	40	433509 5003	82,40
HSK-A 63	MT 1	100	25	433509 6301	84,50
HSK-A 63	MT 2	120	32	433509 6302	84,50
HSK-A 63	MT3	140	40	433509 6303	87,-
HSK-A 63	MT 4	160	48	433509 6304	89,-
HSK-A 100	MT 1	110	25	433509 1001	113,-
HSK-A 100	MT 2	120	32	433509 1002	113,-
HSK-A 100	MT3	150	40	433509 1003	114,-
HSK-A 100	MT 4	170	48	433509 1004	116,-
HSK-A 100	MT 5	200	63	433509 1005	133,50

4117



Continued on next page &gt;&gt;&gt;



Bring light to the dark ...

... with LED.

**ATORN®**  
Performance demands quality

**DIN ISO 7388-1 / DIN 69871 AD**

- Internal coolant supply

Shank	Shank design interior	A mm	D mm	art.no.	€
SK 40	MT 1	50	25	<b>433503</b> 4001	<b>36,70</b>
SK 40	MT 2	50	32	433503 4002	<b>36,70</b>
SK 40	MT 2	117	32	433503 4102	<b>62,10</b>
SK 40	MT3	70	40	433503 4003	<b>36,70</b>
SK 40	MT3	133	40	433503 4103	<b>62,10</b>
SK 40	MT 4	95	48	433503 4004	<b>39,70</b>
SK 40	MT 4	156	48	433503 4104	<b>69,20</b>
SK 50	MT 1	45	25	433503 5001	<b>50,90</b>
SK 50	MT 2	60	32	433503 5002	<b>50,90</b>
SK 50	MT 2	117	32	433503 5102	<b>118,-</b>
SK 50	MT3	65	40	433503 5003	<b>50,90</b>
SK 50	MT3	137	40	433503 5103	<b>118,-</b>
SK 50	MT 4	95	48	433503 5004	<b>50,90</b>
SK 50	MT 4	167	48	433503 5104	<b>129,50</b>
SK 50	MT 5	105	63	433503 5005	<b>57,-</b>
SK 50	MT 5	197	63	433503 5105	<b>138,50</b>

4117

**DIN ISO 7388-2 / MAS BT JIS B 6339**

- Internal coolant supply

Shank	Shank design interior	A mm	D mm	art.no.	€
BT 40	MT 1	50	25	<b>433507</b> 4001	<b>36,70</b>
BT 40	MT 2	50	32	433507 4002	<b>36,70</b>
BT 40	MT3	70	40	433507 4003	<b>36,70</b>
BT 40	MT 4	95	48	433507 4004	<b>39,70</b>
BT 50	MT 1	45	25	433507 5001	<b>50,90</b>
BT 50	MT 2	60	32	433507 5002	<b>50,90</b>
BT 50	MT3	65	40	433507 5003	<b>50,90</b>
BT 50	MT 4	95	48	433507 5004	<b>50,90</b>
BT 50	MT 5	105	63	433507 5005	<b>57,-</b>

4117

**DIN 2080**

Shank	Shank design interior	A mm	D mm	art.no.	€
SK 40	MT 1	50	25	<b>433501</b> 4001	<b>35,60</b>
SK 40	MT 2	50	32	433501 4002	<b>35,60</b>
SK 40	MT3	65	40	433501 4003	<b>35,60</b>
SK 40	MT 4	95	48	433501 4004	<b>35,60</b>
SK 50	MT 1	45	25	433501 5001	<b>49,90</b>
SK 50	MT 2	60	32	433501 5002	<b>49,90</b>
SK 50	MT3	65	40	433501 5003	<b>49,90</b>
SK 50	MT 4	70	48	433501 5004	<b>49,90</b>
SK 50	MT 5	105	63	433501 5005	<b>56,-</b>

4117

**SARA® Reducing bushes, type H****DIN 2185**

- For tools with a Morse taper
- Hardened, ground inside and outside



Taper external	Taper internal	L mm	art.no.	€
MT 1	MT 0	80	<b>400501</b> 0100	<b>11,65</b>
MT 2	MT 1	92	400501 0201	<b>10,10</b>
MT3	MT 1	99	400501 0301	<b>12,60</b>
MT3	MT 2	112	400501 0302	<b>12,60</b>
MT 4	MT 1	124	400501 0401	<b>17,80</b>
MT 4	MT 2	124	400501 0402	<b>17,80</b>
MT 4	MT3	140	400501 0403	<b>17,80</b>

4107

Taper external	Taper internal	L mm	art.no.	€
MT 5	MT 1	156	400501 0501	<b>29,10</b>
MT 5	MT 2	156	400501 0502	<b>29,10</b>
MT 5	MT3	156	400501 0503	<b>29,10</b>
MT 5	MT 4	171	400501 0504	<b>29,10</b>
MT 6	MT3	218	400501 0603	<b>70,60</b>
MT 6	MT 4	218	400501 0604	<b>70,60</b>
MT 6	MT 5	218	400501 0605	<b>70,60</b>

4107



## SARA® Extension sleeves, type H

**DIN  
2187**

- For tools with a Morse taper
- Hardened, ground inside and outside

### Extension sleeve

- Inner taper = outer taper

Taper external	Taper internal	External Ø mm	L mm	art.no.	€
MT 1	MT 1	20	145	<b>400505 0101</b>	<b>14,65</b>
MT 2	MT 2	30	175	400505 0202	22,-
MT3	MT3	36	215	400505 0303	28,50
MT 4	MT 4	48	265	400505 0404	48,-
MT 5	MT 5	63	335	400505 0505	96,10

4107



### Extended reducing bush

- Inner taper < outer taper

Taper external	Taper internal	External Ø mm	L mm	art.no.	€
MT 2	MT 1	20	160	<b>400505 0201</b>	<b>14,65</b>
MT3	MT 1	20	175	400505 0301	18,65
MT3	MT 2	30	194	400505 0302	22,-
MT 4	MT 1	20	200	400505 0401	28,80
MT 4	MT 2	30	215	400505 0402	28,50
MT 4	MT3	36	240	400505 0403	28,50
MT 5	MT 1	20	232	400505 0501	46,80
MT 5	MT 2	30	247	400505 0502	46,80
MT 5	MT3	36	268	400505 0503	46,80
MT 5	MT 4	48	300	400505 0504	46,80
MT 6	MT 4	48	355	400505 0604	111,-
MT 6	MT 5	63	390	400505 0605	111,-

4107



### Expansion sleeve

- Inner taper > outer taper (for easy machining)

Taper external	Taper internal	External Ø mm	L mm	art.no.	€
MT 1	MT 2	30	160	<b>400505 0102</b>	<b>22,-</b>
MT 2	MT3	36	196	400505 0203	28,50
MT3	MT 4	48	240	400505 0304	48,10
MT 4	MT 5	63	300	400505 0405	94,60

4107



## AMF Ejector drift

**DIN  
317**

- For DIN 228 tool tapers
- Special steel, hardened
- Tempered to a burnished shade

### Standard

for Morse tapers	for metr. taper	Total length mm	Cross section mm	art.no.	€
0	4 + 6	90	12 x 3	<b>400530 0000</b>	<b>3,68</b>
1 + 2	-	140	20 x 5	400530 0102	4,47
3	-	190	25 x 7	400530 0003	7,35
4	-	225	30 x 10	400530 0004	14,70
5 + 6	-	265	35 x 15	400530 0506	33,80

4159



### Semi-automatic

- With plastic-coated handle and finger guard

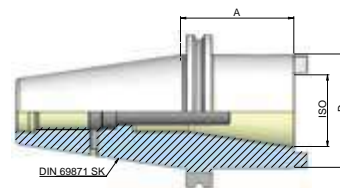
for Morse tapers	Total length mm	art.no.	€
1 - 3	330	<b>400535 0103</b>	<b>67,50</b>
4 - 6	380	400535 0406	84,10

4159



## ATORN® Adapter sleeves for steep-angle tapers

- For holding all steep-angle taper systems (DIN 2080, ISO7388-1 / DIN 69871, MAS BT, ANSI-CAT)
- Pre-balanced to G 2.5 / 25,000 rpm
- Alloyed case-hardened steel with a core tensile strength of min. 950 N/mm<sup>2</sup>
- Case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080, max. true running accuracy < 0.005 mm



### DIN ISO 7388-1 / DIN 69871 A

Shank	Shank design interior	A mm	D mm	art.no.	€
SK 40	SK 30	50	50	<b>433903</b> 4030	88,-
SK 40	SK 40	100	63	433903 4040	91,10
SK 50	SK 40	70	70	433903 5040	112,-
SK 50	SK 50	120	97	433903 5050	128,50

4117



### DIN ISO 7388-2 / MAS BT JIS B 6339

Shank	Shank design interior	A mm	D mm	art.no.	€
BT 40	BT 30	60	50	<b>433907</b> 4030	88,-
BT 40	BT 40	100	63	433907 4040	91,10
BT 50	BT 40	70	70	433907 5040	112,-
BT 50	BT 50	120	97	433907 5050	128,50

4117



### DIN 2080

Shank	Shank design interior	A mm	D mm	art.no.	€
SK 40	SK 30	50	50	<b>433901</b> 4030	88,-
SK 40	SK 40	100	63	433901 4040	91,10
SK 50	SK 40	50	70	433901 5040	112,-
SK 50	SK 50	125	97	433901 5050	128,50

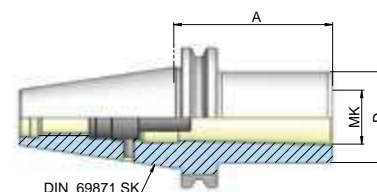
4117



## ATORN® Adapter sleeves for MT with clamping threads

### DIN 6364

- Alloyed case-hardened steel, core tensile strength min. 950 N/mm<sup>2</sup>
- Pre-balanced to G 2.5 / 25,000 rpm
- Case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080
- Max. true running accuracy < 0.005 mm
- Additional versions available on request



### DIN ISO 7388-1 / DIN 69871 A

Shank	Shank design interior	A mm	D mm	art.no.	€
SK 40	MT 1	50	25	<b>433703</b> 4001	59,-
SK 40	MT 2	50	32	433703 4002	59,-
SK 40	MT3	70	40	433703 4003	59,-
SK 40	MT 4	95	48	433703 4004	63,10
SK 50	MT 1	45	25	433703 5001	76,30
SK 50	MT 2	60	32	433703 5002	76,30
SK 50	MT3	65	40	433703 5003	76,30
SK 50	MT 4	70	48	433703 5004	82,40
SK 50	MT 5	100	63	433703 5005	84,50

4117



## DIN ISO 7388-2 / MAS BT JIS B 6339

Shank	Shank design interior	A mm	D mm	art.no.	€
BT 40	MT 1	50	25	433707 4001	59,-
BT 40	MT 2	50	32	433707 4002	59,-
BT 40	MT3	70	40	433707 4003	59,-
BT 40	MT 4	95	48	433707 4004	63,10
BT 40	MT 4	110	63	433707 4104	69,20
BT 50	MT 1	45	25	433707 5001	76,30
BT 50	MT 2	60	32	433707 5002	76,30
BT 50	MT3	65	40	433707 5003	76,30
BT 50	MT 4	70	48	433707 5004	82,40
BT 50	MT 5	100	63	433707 5005	84,50
BT 50	MT 4	85	63	433707 5104	89,-
BT 50	MT 5	118	78	433707 5105	97,20

4117



## ATORN® Tool holding fixture for indexable insert drill bits

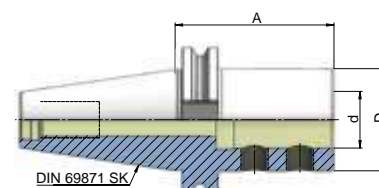
- Alloyed case-hardened steel, core tensile strength min. 950 N/mm<sup>2</sup>
- **Pre-balanced to G 2.5 / 25,000 rpm**
- Case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080
- Max. true running accuracy < 0.005 mm
- Additional versions available on request

## DIN ISO 7388-1 / DIN 69871 AD/AF

- Internal coolant supply

Shank	d mm	A mm	D mm	art.no.	€
SK 40	20	65	40	434540 4020	59,-
SK 40	25	70	45	434540 4025	52,90
SK 40	32	75	52	434540 4032	52,90
SK 40	40	115	60	434540 4040	64,10
SK 50	20	70	40	434540 5020	83,40
SK 50	25	70	40	434540 5025	83,40
SK 50	32	70	52	434540 5032	83,40
SK 50	40	80	60	434540 5040	83,40
SK 50	50	90	75	434540 5050	93,60

4117



## ATORN® Tool holding fixtures for screw-in milling cutters

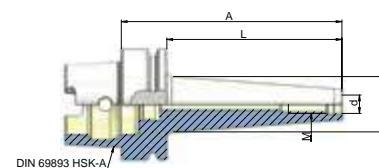
- Taper angle tolerance AT3
- **Pre-balanced to G 2.5 / 25,000 rpm**
- True running accuracy of steep taper tool holder, DIN 69871: < 0.003 mm, HSK 63 A: < 0.005 mm
- MAS/BT-AD/AF version available on request

## DIN69893 Form A (HSK-A)

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	Thread	D mm	d mm	A mm	L mm	art.no.	€
HSK 63	M6	13	10	51	25	430236 6061	158,-
HSK 63	M8	23	13	76	50	430236 6082	173,-
HSK 63	M8	23	13	101	75	430236 6083	189,50
HSK 63	M10	20	18	51	25	430236 6101	165,-
HSK 63	M10	23	18	76	50	430236 6102	180,50
HSK 63	M10	32	18	126	100	430236 6104	214,-
HSK 63	M12	24	21	51	25	430236 6121	165,-
HSK 63	M12	24	21	76	50	430236 6122	180,50
HSK 63	M12	31	21	101	75	430236 6123	194,50
HSK 63	M12	33	21	126	100	430236 6124	214,-
HSK 63	M12	40	21	176	150	430236 6126	255,-
HSK 63	M16	29	29	51	25	430236 6161	165,-
HSK 63	M16	34	29	76	50	430236 6162	180,50
HSK 63	M16	34	29	101	75	430236 6163	194,50
HSK 63	M16	36	29	126	100	430236 6164	214,-
HSK 63	M16	43	29	176	150	430236 6166	255,-

4117



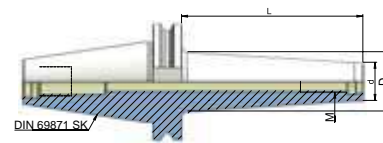
Continued on next page &gt;&gt;&gt;

**DIN ISO 7388-1 / DIN 69871 AD**

- Internal coolant supply

Shank	Thread	D mm	d mm	A mm	L mm	art.no.	€
SK 40	M6	13	10	44	25	<b>430235 4061</b>	<b>88,-</b>
SK 40	M6	20	10	69	50	430235 4062	101,-
SK 40	M6	23	10	94	75	430235 4063	110,-
SK 40	M8	15	13	44	25	430235 4081	88,-
SK 40	M8	23	13	69	50	430235 4082	101,-
SK 40	M8	23	13	94	75	430235 4083	110,-
SK 40	M10	20	18	44	25	430235 4101	87,50
SK 40	M10	23	18	69	50	430235 4102	95,60
SK 40	M10	28	18	94	75	430235 4103	110,-
SK 40	M12	24	21	44	25	430235 4121	87,50
SK 40	M12	24	21	69	50	430235 4122	95,60
SK 40	M12	31	21	94	75	430235 4123	110,-
SK 40	M16	29	29	44	25	430235 4161	90,60
SK 40	M16	34	29	69	50	430235 4162	101,-
SK 40	M16	34	29	94	75	430235 4163	110,-

4117


**palbit** Extension for modular milling cutter heads
**Solid carbide extension**

- Straight version
- With internal coolant supply

D mm	L mm	Thread	art.no.	€
12	100	M6	<b>430352 1210</b>	<b>264,-</b>
12	150	M6	430352 1215	322,-
16	100	M8	430352 1610	308,-
16	150	M8	430352 1615	370,-
20	150	M10	430352 2015	470,-
20	200	M10	430352 2020	589,-
25	150	M12	430352 2515	609,-
25	200	M12	430352 2520	829,-

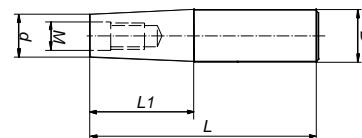
4201

**Vibration-dampened**

- Offset straight shank
- without internal coolant supply

D mm	d mm	L mm	L1 mm	Thread	art.no.	€
12	9.8	90	40	M6	<b>430350 1209</b>	<b>284,-</b>
12	9.8	110	60	M6	430350 1211	332,-
12	9.8	130	80	M6	430350 1213	435,-
12	12.8	95	40	M8	430350 1609	390,-
16	12.8	115	60	M8	430350 1611	405,-
16	12.8	135	80	M8	430350 1613	669,-
16	12.8	155	100	M8	430350 1615	669,-
16	12.8	175	120	M8	430350 1617	669,-
20	15.8	100	40	M10	430350 2010	529,-
20	15.8	120	60	M10	430350 2012	529,-
20	15.8	140	80	M10	430350 2014	659,-
20	17.8	140	80	M10	430350 2015	659,-
20	15.8	160	100	M10	430350 2016	679,-
20	17.8	160	100	M10	430350 2017	679,-
20	15.8	180	120	M10	430350 2018	929,-
20	17.8	180	120	M10	430350 2019	929,-
25	20.8	125	60	M12	430350 2512	949,-
25	20.8	145	80	M12	430350 2514	949,-
25	20.8	165	100	M12	430350 2516	949,-

4201

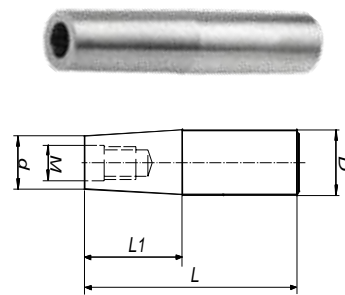


**Steel extensions for modular milling cutter heads**

- Offset straight shank
- No internal coolant supply

D mm	d mm	L mm	L1 mm	Thread	art.no.	€
12	9.8	65	20	M6	<b>430351 1206</b>	<b>97,40</b>
16	12.8	88	40	M8	430351 1608	109,50
20	17.8	95	45	M10	430351 2010	115,50
25	20.8	106	50	M12	430351 2512	121,50
32	28.8	110	50	M16	430351 3216	128,-

4201



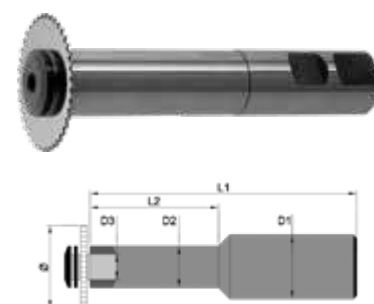
**Saw blade holding fixtures**

- For holding saw blades from Ø 20 to Ø 100 mm
- Highly hardened and tempered
- Shank design in accordance with DIN 1835 B
- High true-running accuracy
- Supplied without disc milling cutter

**Individual**

for saw blade size	L1 mm	L2 mm	D1 mm	D2 mm	D3 mm	art.no.	€
20	75	30	10	10	5	<b>438082 1020</b>	<b>105,-</b>
20	90	30	20	10	5	438082 2020	95,60
25	88	48	10	13	8	438082 1025	105,-
25	100	42	20	13	8	438082 2025	95,60
32	93	53	10	16	8	438082 1032	105,-
32	105	53	20	16	8	438082 2032	95,60
40	100	60	10	19.5	10	438082 1040	105,-
40	110	60	20	19.5	10	438082 2040	95,60
50	126	78	16	24.5	13	438082 1650	105,-
50	136	78	25	24.5	13	438082 2550	95,60
63	126	78	16	24.5	16	438082 1663	105,-
63	136	78	25	24.5	16	438082 2563	95,60
80	142	92	20	34	22	438082 2080	143,50
80	150	92	25	34	22	438082 2580	131,50
100	142	92	20	39.5	22	438082 2010	143,50
100	150	92	25	39.5	22	438082 2510	131,50

4107



**Set**

Contents	art.no.	€
6 saw blade mounts for saw blade Ø 20 mm to 63 mm	<b>438083 2506</b>	<b>569,-</b>

4107



Grooving from 2 mm ...

... with internal cooling.

**ATORN®**  
Performance demands quality

## diebold Innovations in shrink-fit technology

### New units with innovative temperature control and automatic cooling

Diebold Series US 1100 shrink-fit units are available in both a horizontal and a vertical version. If the units are equipped with **pyrometer control**, the shrinking process runs under controlled temperature. The pyrometer technology in the coil ensures direct temperature monitoring. A world-first solution for more reliable and gentle tool shrinking (in and out).

The temperature is measured directly on the shrink-fit holder and automatically controlled during the shrink-fit process by way of **TempControl**. This is revolutionary, as until now all conventional shrink-fit units have controlled the shrink-fit process indirectly via stored parameters but the actual temperature of the shrink-fit unit was unknown.

### US 1100 with automatic TubeChiller cooling of the tool holder.

With the TubeChiller we offer you a fully-automated solution for the optimal shrinkage and automatic cooling of tools. This technology was developed to combine our US 1100 Series shrink-fit units with the automatic cooling of the TubeChiller.



Video on YouTube channel

### Advantages of the Diebold shrink-fit technology

1. US 1100 shrink-fit unit with pyrometer control for automatic temperature recognition
2. Horizontal and vertical units cover all applications
3. TubeChiller for automatic "hands-free" cooling
4. Gentle shrinking, which means no overheating of the shrink fit holder, for long service life of your shrink fit holder
5. Finely-tuned parameters for shrinking in all shrinking units
6. High-quality stainless steel shrink fit holder
7. No increase in tolerances through artificial ageing of the material
8. Thus higher quality and longer usability of the high accuracy
9. Production in fully-air-conditioned hall, quality assurance in Grade 2 measurement rooms



Following the shrinking process, the cooling pipe moves upwards from the TubeChiller while the coolant rises in the cooling pipe and flows around the tool in a circle. Through this movement the induction coil is automatically returned to its start position without any additional drive required. Once cooled, the cooling pipe is lowered again, the liquid flows back into the tank in the sub-structure and the tool mount is dried efficiently with compressed air.

## diebold Inductive shrink-fit unit ThermoGrip MS502-P

- Gentle and targeted heating thanks to parameterised generator output
- Simple and secure handling
- Also suitable for standard chucks, Ø 3 to 16 mm
- Gentle heating thanks to controllable generator output
- Low heat output, cooling using air cooling unit is sufficient
- Only suitable for carbide shanks
- Supplied with 4 shielding rings and protective gloves, no tool holder



432725 0001



432725 0002

### Inductive shrink-fit unit ThermoGrip MS502

Description	for Ø mm	Output kW	Connection	Weight kg	art.no.	€
With cooling unit	3 - 20	3	220V	17	432725 0002	4.379,-
Without cooling	3 - 20	3	220V	15	432725 0001	3.669,-

4129

### Tool holders for MS502-P

Description	art.no.	€
Tool holder HSK 25	432745 0025	395,-
Tool holder HSK 32	432745 0032	405,-
Tool holder HSK 40	432745 0040	415,-
Tool holder HSK 50	432745 0050	415,-
Tool holder HSK 63	432745 0063	440,-
Tool holder SK 30	432745 0130	465,-
Tool holder SK 40	432745 0140	465,-

4129





# diebold Inductive shrink-fit unit ThermoGrip US1 100, with pyrometer coil

NEW

The pyrometer coil also permits automatic and direct temperature control of the shrink-fit holder during heating. This prevents burning the shrink-fit holder. The quick and reliable shrinking process requires no prior identification of the shrink-fit holder.

- Shrink length approx. 500mm
- Shrinking of SC shanks measuring Ø3 - 20mm and HSS steel shanks measuring Ø 6 - 32mm
- Manual shrink-fitting possible
- Contour-independent cooling, cleaning and preserving can be carried out when used together with the ATORN cooling station
- **Supplied with 5 ferrite discs, protective gloves and pyrometer coil**



## Vertical

- Includes centring disc for HSK100 / 80 / 63 and Ø 20

Dimensions W x D x H mm	Output kW	Connection	art.no.	€
570 x 420 x 730	11	400 V / 16 A	<b>432863</b> 1100	<b>8.439,-</b>
4129				

## Horizontal

- Without basic set and tool mount for basic set

Dimensions W x D x H mm	Output kW	Connection	art.no.	€
700 x 470 x 387	11	400 V / 16 A	<b>432861</b> 1100	<b>8.019,-</b>
4129				



## Basic set for tool holders with art.no. 432731...

Description	art.no.	€
Base support for article no. 432731....	<b>432730</b> 1100	<b>122,50</b>
4129		



## Tool mount for basic set US1 100

Description	art.no.	€
Universal clamp for all interfaces	<b>432731</b> 1100	<b>1.049,-</b>
Tool holder SK 30	432731 1130	<b>579,-</b>
Tool holder SK 40	432731 1140	<b>579,-</b>
Tool holder SK 50	432731 1150	<b>679,-</b>
Tool holder HSK 32	432731 0032	<b>509,-</b>
Tool holder HSK 40	432731 0040	<b>509,-</b>
Tool holder HSK 50	432731 0050	<b>509,-</b>
Tool holder HSK 63	432731 0063	<b>509,-</b>
Tool holder HSK 80	432731 0080	<b>859,-</b>
Tool holder HSK 100	432731 0100	<b>859,-</b>
4129		



432731 1100



## Length adjustment for US1 100 horizontal and vertical

Description	art.no.	€
with brass fixed stop	<b>432752</b> 1002	<b>1.729,-</b>
With dial indicator	432752 1001	<b>1.889,-</b>
4129		



432752 1001

432752 1002



**ATORN® Inductive shrink-fit unit with induction coil****NEW**

The ATORN shrink-fit unit has shrinking parameters for standard, slim and reinforced mounts, as well as shrink-fit collets.

- Shrink length approx. 500 mm
- Shrinking of SC shanks measuring  $\varnothing$  3 - 20 mm and HSS steel shanks measuring  $\varnothing$  6 - 32 mm
- Manual shrink-fitting possible
- Contour-independent cooling, cleaning and preserving can be carried out when used together with the ATORN cooling station
- **Supplied with 5 ferrite discs, protective gloves and basic coil**

**Vertical**

- Includes centring disc for HSK 100 / 80 / 63 and  $\varnothing$  20

Dimensions W x D x H mm	Output kW	Connection	art.no.	€
570 x 420 x 730	11	400 V / 16 A	<b>432851 0001</b>	<b>6.199,-</b>
4129				

**Horizontal**

- Without basic set and tool mount for basic set

Dimensions W x D x H mm	Output kW	Connection	art.no.	€
700 x 470 x 387	11	400 V / 16 A	<b>432850 0001</b>	<b>5.789,-</b>
4129				

**Universal clamp for shrink-fit unit Horizontal**

Description	art.no.	€
Universal clamp including base support	<b>432852 0001</b>	<b>1.169,-</b>
4129		

**ATORN® Liquid cooler****NEW**

- Electronic-controlled liquid cooler for shrink-fit holders
- Contour-independent cooling
- Cools, cleans and preserves holding fixtures in a single operation, automatically at the push of a button
- Cycle time approx. 40 sec.
- Supplied with SK / BT 40 base support and 1 litre of liquid coolant concentrate
- Please order necessary tool holder separately! (Hose and blow gun not included)
- No tool holder required for any HSK interfaces
- **Pneumatic 6 bar compressed air**

Dimensions W x D x H mm	Compressed air connection bar	art.no.	€
412 x 462 x 700	6	<b>432829 1001</b>	<b>2.359,-</b>
4129			



## diebold ThermoGrip® shrink fit holder

- Straight shank milling tools clamped with a high level of precision
- Tool shanks in accordance with DIN 6335 type HA, HB and HE. Tool shanks in accordance with DIN 1835 type A and B with shank tolerance h6 and Ra < 0.3
- **Patented counterbore from Ø 6 mm for an automatic shrink-fit process**

### HSK A DIN 69893

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used
- Balanced at 24,000 rpm

Shank	Clamp Ø mm	d2 mm	d3 mm	l1 mm	A mm	Thread	art.no.	€
HSK-A 63	3	15	20	20	90	M6	<b>430218 6303</b>	158,-
HSK-A 63	4	15	20	20	90	M6	430218 6304	158,-
HSK-A 63	5	15	25	25	90	M6	430218 6305	158,-
HSK-A 63	6	20	27	36	80	M5	430218 6306	141,50
HSK-A 63	6	20	27	36	90	M5	430218 6406	141,50
HSK-A 63	6	20	27	36	120	M5	430218 6506	179,-
HSK-A 63	6	20	32	36	160	M5	430218 6606	202,-
HSK-A 63	8	20	27	36	80	M6	430218 6308	141,50
HSK-A 63	8	20	27	36	90	M6	430218 6408	141,50
HSK-A 63	8	20	27	36	120	M6	430218 6508	179,-
HSK-A 63	8	20	32	36	160	M6	430218 6608	202,-
HSK-A 63	10	24	32	42	85	M8x1	430218 6310	141,50
HSK-A 63	10	24	32	42	90	M8x1	430218 6410	141,50
HSK-A 63	10	24	32	42	120	M8x1	430218 6510	179,-
HSK-A 63	10	24	34	42	160	M8x1	430218 6610	202,-
HSK-A 63	12	24	32	47	90	M10x1	430218 6312	141,50
HSK-A 63	12	24	32	47	120	M10x1	430218 6512	179,-
HSK-A 63	12	24	34	47	160	M10x1	430218 6612	202,-
HSK-A 63	14	27	34	47	90	M10x1	430218 6314	141,50
HSK-A 63	14	27	34	47	120	M10x1	430218 6414	179,-
HSK-A 63	14	27	42	47	160	M10x1	430218 6514	202,-
HSK-A 63	16	27	34	50	95	M12x1	430218 6316	141,50
HSK-A 63	16	27	34	50	120	M12x1	430218 6516	179,-
HSK-A 63	16	27	42	50	160	M12x1	430218 6616	202,-
HSK-A 63	18	33	42	50	95	M12x1	430218 6318	141,50
HSK-A 63	18	33	42	50	120	M12x1	430218 6418	179,-
HSK-A 63	18	33	51	50	160	M12x1	430218 6518	202,-
HSK-A 63	20	33	42	52	100	M16x1	430218 6320	141,50
HSK-A 63	20	33	42	52	120	M16x1	430218 6520	179,-
HSK-A 63	20	33	51	52	160	M16x1	430218 6620	202,-
HSK-A 63	25	44	53	58	115	M16x1	430218 6325	141,50
HSK-A 63	25	44	53	58	160	M16x1	430218 6425	202,-
HSK-A 63	32	44	53	62	120	M16x1	430218 6532	179,-
HSK-A 63	32	44	53	62	160	M16x1	430218 6632	202,-

4131

### DIN ISO 7388-1 / DIN 69871 AD/AF

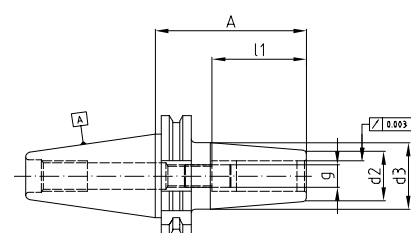
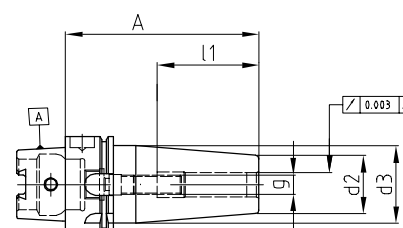
- Internal coolant supply
- Balanced at 18,000 rpm

Shank	Clamp Ø mm	d2 mm	d3 mm	l1 mm	A mm	Thread	V mm	art.no.	€
SK 40	3	15	20	20	80	M6	5	<b>430216 4003</b>	148,50
SK 40	4	15	20	20	80	M6	5	430216 4004	148,50
SK 40	5	15	20	25	80	M6	5	430216 4005	148,50
SK 40	6	20	27	36	80	M5	10	430216 4006	115,-
SK 40	6	20	32	36	160	M5	10	430216 4106	156,-
SK 40	8	20	27	36	80	M6	10	430216 4008	115,-
SK 40	8	20	32	36	160	M6	10	430216 4108	156,-
SK 40	10	24	32	42	80	M8x1	10	430216 4010	115,-
SK 40	10	24	34	42	160	M8x1	10	430216 4110	156,-

4131



Cross-section view shows the patented cylindrical counterbore (red)



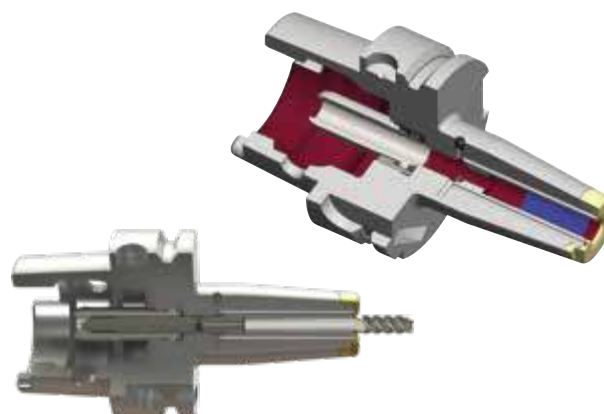
Continued on next page &gt;&gt;&gt;

Shank	Clamp Ø mm	d2 mm	d3 mm	l1 mm	A mm	Thread	V mm	art.no.	€
SK 40	12	24	32	47	80	M10x1	10	430216 4012	115,-
SK 40	12	24	34	47	160	M10x1	10	430216 4212	156,-
SK 40	14	27	34	47	80	M10x1	10	430216 4014	115,-
SK 40	14	27	42	47	160	M10x1	10	430216 4114	156,-
SK 40	16	27	34	50	80	M12x1	10	430216 4016	115,-
SK 40	16	27	42	50	160	M12x1	10	430216 4216	156,-
SK 40	18	33	42	50	80	M12x1	10	430216 4018	115,-
SK 40	18	33	50	50	160	M12x1	10	430216 4118	156,-
SK 40	20	33	42	52	80	M16x1	10	430216 4020	115,-
SK 40	20	33	50	52	160	M16x1	10	430216 4220	156,-
SK 40	25	44	50	58	100	M16x1	10	430216 4025	115,-
SK 40	32	44	50	62	100	M16x1	10	430216 4032	115,-

4131

## diebold JetSleeve 2® ThermoGrip® shrink fit holders

- Revolutionary solution for mould engineering and HSC machining
- Standard version suitable for air and cooling lubricant, versions for minimum volume lubrication available on request
- The coolant is fed via various nozzles directly to the cutting edge. Chips are blown away and not run through.
- Up to 300 % higher endurance
- No surface scratching by chips
- Optimum tool holder cooling right through to the cutting edge
- Innovation in the JetSleeve 2®  
Rotating chuck with media duct, the milling machine does not need to be retrofitted  
.Pressure is built up in the nozzle unit, and the flow effect from the nozzles keeps the coolant jet on the milling cutter shank at all times. JetSleeve chucks can be used on all conventional milling machines with internal coolant supply
- Suitable for all agents: air, minimum volume lubrication, cutting fluid
- Energy-efficient and environmentally friendly
- Shrinking with screwed-on nozzle cover possible

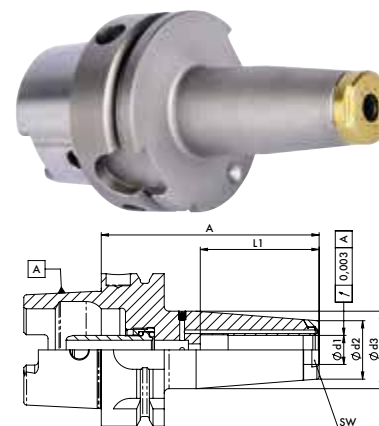


### HSK A DIN 69893

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used

Shank	d1 mm	d2 mm	d3 mm	L1 mm	A mm	Wr. width mm	art.no.	€
HSK-A 63	3	15	20	20	90	13	430331 6303	312,-
HSK-A 63	4	15	20	20	90	13	430331 6304	312,-
HSK-A 63	6	21	27	36	80	17	430331 6306	298,-
HSK-A 63	8	21	27	36	80	17	430331 6308	298,-
HSK-A 63	10	24	32	42	85	20	430331 6310	298,-
HSK-A 63	12	24	32	47	90	20	430331 6312	298,-
HSK-A 63	16	33	34	50	95	29	430331 6316	298,-
HSK-A 63	20	44	42	52	100	40	430331 6320	298,-

4129

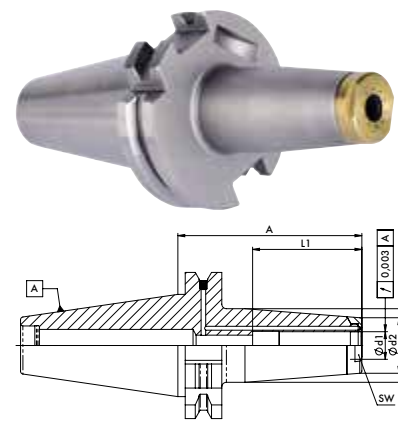


### DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply

Shank	d1 mm	d2 mm	d3 mm	L1 mm	A mm	Wr. width mm	art.no.	€
SK 40	3	15	20	20	80	13	430330 4003	286,-
SK 40	4	15	20	20	80	13	430330 4104	286,-
SK 40	6	21	27	36	80	17	430330 4206	269,-
SK 40	8	21	27	36	80	17	430330 4308	269,-
SK 40	10	24	32	42	80	20	430330 4410	269,-
SK 40	12	24	32	47	80	20	430330 4512	269,-
SK 40	16	33	34	50	80	29	430330 4616	269,-
SK 40	20	44	42	52	80	40	430330 4620	269,-

4129

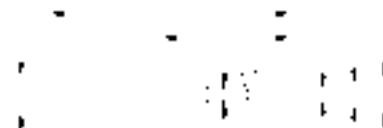


## diebold Shrink-fit extensions

- Extend your shrink-fit chucks on a modular basis, as you need it!
- Best possible holding force
- Maximum slenderness ratio (3° draft)
- Almost monolithic form
- Further sizes available on request

D mm	d1 mm	d2 mm	d3 mm	A mm	L mm	Thread	art.no.	€
12	3	9	11.8	63	110	-	<b>430229</b> 1203	<b>114,-</b>
12	4	10	11.8	63	110	-	430229 1204	<b>114,-</b>
12	5	11	11.8	63	110	-	430229 1205	<b>114,-</b>
12	6	12	17	63	110	M5	430229 1206	<b>107,-</b>
12	8	14	19	63	110	M6	430229 1208	<b>107,-</b>
16	3	9	13	60	110	M6	430229 1603	<b>114,-</b>
16	4	10	14	60	110	M6	430229 1604	<b>114,-</b>
16	5	11	15	58	110	M6	430229 1605	<b>114,-</b>
16	6	12	15.8	60	110	M5	430229 1606	<b>107,-</b>
16	8	14	19	60	110	M6	430229 1608	<b>107,-</b>
20	3	9	13	58	110	M6	430229 2003	<b>114,-</b>
20	4	10	14	58	110	M6	430229 2004	<b>114,-</b>
20	5	11	15	58	110	M6	430229 2005	<b>114,-</b>
20	6	12	16	58	110	M5	430229 2006	<b>107,-</b>
20	8	14	19	58	110	M6	430229 2008	<b>107,-</b>

4131

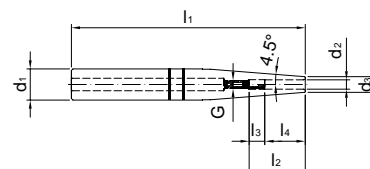


## ATORN® Shrink-fit chuck extension

- For extension and reduction to suit smaller diameters
- Slenderness ratio 4.5°
- For shank tolerance h6
- Tool stop screw with 10 mm adjustment range

d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	art.no.	€
12	3	8	150						<b>430228</b> 1203	<b>101,-</b>
12	4	8	150						430228 1204	<b>95,10</b>
12	5	10	150						430228 1205	<b>95,10</b>
12	6	10	150	36	10	26	M5	2.5 mm	430228 1206	<b>95,10</b>
16	3	10	150						430228 1603	<b>101,-</b>
16	4	10	150						430228 1604	<b>95,10</b>
16	5	10	150						430228 1605	<b>95,10</b>
16	6	10	150	36	10	26	M5	2.5 mm	430228 1606	<b>90,60</b>
16	8	12	150	36	10	26	M6	3 mm	430228 1608	<b>90,60</b>
20	3	10	150						430228 2003	<b>95,10</b>
20	4	10	150						430228 2004	<b>95,10</b>
20	5	10	150						430228 2005	<b>95,10</b>
20	6	10	150	36	10	26	M5	2.5 mm	430228 2006	<b>90,60</b>
20	8	12	150	36	10	26	M6	3 mm	430228 2008	<b>90,60</b>
20	10	14	150	42	10	32	M8x1	3 mm	430228 2010	<b>90,60</b>
20	12	16	150	47	10	37	M10x1	5 mm	430228 2012	<b>90,60</b>
25	3	10	150						430228 2503	<b>101,-</b>
25	4	10	150						430228 2504	<b>101,-</b>
25	5	15	150						430228 2505	<b>101,-</b>
25	6	20	150	36	10	26	M5	2.5 mm	430228 2506	<b>101,-</b>
25	8	20	150	36	10	26	M6	3 mm	430228 2508	<b>90,60</b>
25	10	20	150	42	10	32	M8x1	3 mm	430228 2510	<b>90,60</b>
25	12	20	150	47	10	37	M10x1	5 mm	430228 2512	<b>90,60</b>
25	14	20	150	47	10	37	M10x1	5 mm	430228 2514	<b>90,60</b>
25	16	22	150	50	10	40	M10x1	5 mm	430228 2516	<b>90,60</b>
32	6	20	150	36	10	26	M5	2.5 mm	430228 3206	<b>90,60</b>
32	8	20	150	36	10	26	M6	3 mm	430228 3208	<b>90,60</b>
32	10	24	150	42	10	32	M8x1	3 mm	430228 3210	<b>90,60</b>
32	12	24	150	47	10	37	M10x1	5 mm	430228 3212	<b>90,60</b>
32	14	27	150	47	10	37	M10x1	5 mm	430228 3214	<b>90,60</b>
32	16	27	150	50	10	40	M10x1	5 mm	430228 3216	<b>90,60</b>
32	18	27	150	50	10	40	M10x1	5 mm	430228 3218	<b>90,60</b>
32	20	27	150	52	10	42	M10x1	5 mm	430228 3220	<b>90,60</b>

4181



## ATORN® Shrink fit holding fixtures 3°, slim version

- High torque transfer
- High true running accuracies 0.003 mm
- 3° range, slim version
- High contour flexibility
- Heat-resistant mild steel
- Further shank designs available on request
- **Balanced to G 2.5 / 25,000 rpm**
- With Balluffchip bore

### HSK-A DIN 69893

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe Article No. 431011... should be used

Shank	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	Weight kg	art.no.	€
HSK 63	3	9	14	80	28	16	12	M6	2 mm	0.7	<b>440431 0003</b>	173,-
HSK 63	3	9	16	120			12			0.8	440431 1203	202,-
HSK 63	3	9	19	160			12			0.8	440431 1603	219,-
HSK 63	3	9	19	200			12			0.9	440431 2003	285,-
HSK 63	4	10	15	80	28	12	16	M6	2 mm	0.7	440431 0004	173,-
HSK 63	4	10	17	120			16			0.8	440431 1204	202,-
HSK 63	4	10	20	160			16			0.9	440431 1604	219,-
HSK 63	4	10	20	200			16			0.95	440431 2004	285,-
HSK 63	5	11	16	80	30	10	20	M6	2 mm	0.7	440431 0005	173,-
HSK 63	5	11	18	120			20			0.8	440431 1205	202,-
HSK 63	5	11	21	160			20			0.9	440431 1605	219,-
HSK 63	5	11	21	200			20			1	440431 2005	285,-
HSK 63	6	12	17	80	36	10	26	M5	2.5 mm	0.7	440431 0006	156,-
HSK 63	6	12	21	120	36	10	26	M5	2.5 mm	0.8	440431 1206	169,-
HSK 63	6	12	24	160	36	10	26	M5	2.5 mm	0.9	440431 1606	212,-
HSK 63	6	12	24	200	36	10	26	M5	2.5 mm	1	440431 2006	265,-
HSK 63	8	14	19	80	36	10	26	M6	3 mm	0.7	440431 0008	156,-
HSK 63	8	14	23	120	36	10	26	M6	3 mm	0.8	440431 1208	169,-
HSK 63	8	14	26	160	36	10	26	M6	3 mm	1	440431 1608	212,-
HSK 63	8	14	26	200	36	10	26	M6	3 mm	1.1	440431 2008	265,-
HSK 63	10	16	21	85	41	10	31	M8x1	3 mm	0.8	440431 0010	156,-
HSK 63	10	16	25	120	41	10	31	M8x1	3 mm	0.9	440431 1210	169,-
HSK 63	10	16	28	160	41	10	31	M8x1	3 mm	1	440431 1610	212,-
HSK 63	10	16	28	200	41	10	31	M8x1	3 mm	1.2	440431 2010	265,-
HSK 63	12	18	24	90	47	10	37	M10x1	5 mm	0.8	440431 0012	156,-
HSK 63	12	18	27	120	47	10	37	M10x1	5 mm	0.9	440431 1212	169,-
HSK 63	12	18	30	160	47	10	37	M10x1	5 mm	1.1	440431 1612	212,-
HSK 63	12	18	30	200	47	10	37	M10x1	5 mm	1.3	440431 2012	265,-
HSK 63	14	20	26	90	47	10	37	M10x1	5 mm	0.8	440431 0014	156,-
HSK 63	14	20	29	120	47	10	37	M10x1	5 mm	1	440431 1214	169,-
HSK 63	14	20	32	160	47	10	37	M10x1	5 mm	1.2	440431 1614	212,-
HSK 63	14	20	32	200	47	10	37	M10x1	5 mm	1.4	440431 2014	265,-
HSK 63	16	22	28	95	50	10	40	M12x1	5 mm	0.8	440431 0016	156,-
HSK 63	16	22	31	120	50	10	40	M12x1	5 mm	1	440431 1216	169,-
HSK 63	16	22	34	160	50	10	40	M12x1	5 mm	1.2	440431 1616	212,-
HSK 63	16	22	34	200	50	10	40	M12x1	5 mm	1.5	440431 2016	265,-
HSK 63	18	24	30	95	50	10	40	M12x1	5 mm	0.9	440431 0018	156,-
HSK 63	18	24	33	120	50	10	40	M12x1	5 mm	1	440431 1218	169,-
HSK 63	18	24	36	160	50	10	40	M12x1	5 mm	1.3	440431 1618	212,-
HSK 63	18	24	36	200	50	10	40	M12x1	5 mm	1.6	440431 2018	265,-
HSK 63	20	26	33	100	52	10	42	M16x1	5 mm	0.9	440431 0020	156,-
HSK 63	20	26	35	120	52	10	42	M16x1	5 mm	1.1	440431 1220	169,-
HSK 63	20	26	38	160	52	10	42	M16x1	5 mm	1.4	440431 1620	212,-
HSK 63	20	26	38	200	52	10	42	M16x1	8 mm	1.7	440431 2020	265,-

4181

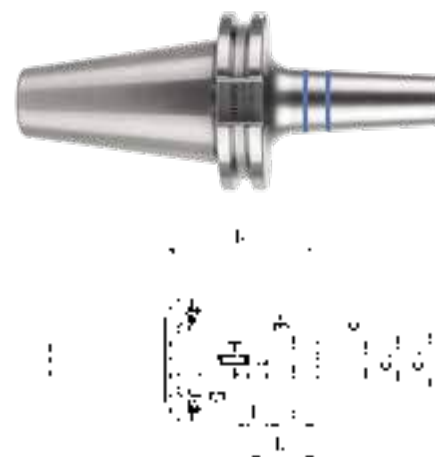


## DIN ISO 7388-1 / DIN 69871 AD/AF

• Internal coolant supply

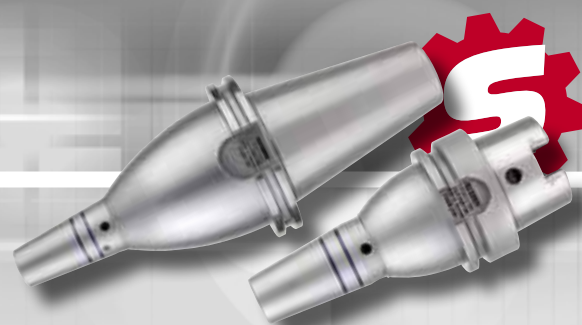
Shank	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	Weight kg	art.no.	€
SK 40	3	9	14	80	28	16	12	M6	2 mm	0.9	<b>440430 0003</b>	<b>157,50</b>
SK 40	3	9	16	120			12			0.9	440430 1203	187,-
SK 40	3	9	19	160			12			1.1	440430 1603	204,-
SK 40	3	9	19	200			12			1.2	440430 2003	270,-
SK 40	4	10	15	80	28	12	16	M6	2 mm	0.9	440430 0004	157,50
SK 40	4	10	17	120			16			0.9	440430 1204	187,-
SK 40	4	10	20	160			16			1.1	440430 1604	204,-
SK 40	4	10	20	200			16			1.2	440430 2004	270,-
SK 40	5	11	16	80	30	10	20	M6	2 mm	0.9	440430 0005	157,50
SK 40	5	11	18	120			20			1	440430 1205	187,-
SK 40	5	11	21	160			20			1.1	440430 1605	204,-
SK 40	5	11	21	200			20			1.2	440430 2005	270,-
SK 40	6	12	17	80	36	10	26	M5	2.5 mm	0.9	440430 0006	135,50
SK 40	6	12	22	120	36	10	26	M5	2.5 mm	1	440430 1206	164,50
SK 40	6	12	24	160	36	10	26	M5	2.5 mm	1.1	440430 1606	188,50
SK 40	6	12	24	200	36	10	26	M5	2.5 mm	1.4	440430 2006	239,-
SK 40	8	14	19	80	36	10	26	M6	3 mm	0.9	440430 0008	135,50
SK 40	8	14	24	120	36	10	26	M6	3 mm	1	440430 1208	164,50
SK 40	8	14	26	160	36	10	26	M6	3 mm	1.2	440430 1608	188,50
SK 40	8	14	26	200	36	10	26	M6	3 mm	1.4	440430 2008	239,-
SK 40	10	16	21	80	41	10	31	M8x1	3 mm	0.9	440430 0010	135,50
SK 40	10	16	26	120	41	10	31	M8x1	3 mm	1.1	440430 1210	164,50
SK 40	10	16	28	160	41	10	31	M8x1	3 mm	1.2	440430 1610	188,50
SK 40	10	16	28	200	41	10	31	M8x1	3 mm	1.6	440430 2010	239,-
SK 40	12	18	23	80	47	10	37	M10x1	5 mm	0.9	440430 0012	135,50
SK 40	12	18	28	120	47	10	37	M10x1	5 mm	1.1	440430 1212	164,50
SK 40	12	18	30	160	47	10	37	M10x1	5 mm	1.3	440430 1612	188,50
SK 40	12	18	30	200	47	10	37	M10x1	5 mm	1.5	440430 2012	239,-
SK 40	14	20	26	80	47	10	37	M10x1	5 mm	0.9	440430 0014	135,50
SK 40	14	20	30	120	47	10	37	M10x1	5 mm	1.1	440430 1214	164,50
SK 40	14	20	32	160	47	10	37	M10x1	5 mm	1.3	440430 1614	188,50
SK 40	14	20	32	200	47	10	37	M10x1	5 mm	1.6	440430 2014	239,-
SK 40	16	22	28	80	50	10	40	M12x1	5 mm	1	440430 0016	135,50
SK 40	16	22	32	120	50	10	40	M12x1	5 mm	1.2	440430 1216	164,50
SK 40	16	22	34	160	50	10	40	M12x1	5 mm	1.4	440430 1616	188,50
SK 40	16	22	34	200	50	10	40	M12x1	5 mm	2.6	440430 2016	239,-
SK 40	18	24	30	80	50	10	40	M12x1	5 mm	1	440430 0018	135,50
SK 40	18	24	34	120	50	10	40	M12x1	5 mm	1.2	440430 1218	164,50
SK 40	18	24	36	160	50	10	40	M12x1	5 mm	1.5	440430 1618	188,50
SK 40	18	24	36	200	50	10	40	M12x1	5 mm	2.8	440430 2018	239,-
SK 40	20	26	32	80	52	10	42	M16x1	8 mm	1	440430 0020	135,50
SK 40	20	26	36	120	52	10	42	M16x1	5 mm	1.2	440430 1220	164,50
SK 40	20	26	38	160	52	10	42	M16x1	5 mm	1.6	440430 1620	188,50
SK 40	20	26	38	200	52	10	42	M16x1	5 mm	2.9	440430 2020	239,-

4181



# Heavy machining

**Shrink-fit mounts with coolant bores for heavy-duty machining available on request!**





## ATORN® Shrink-fit holding fixtures 4.5°

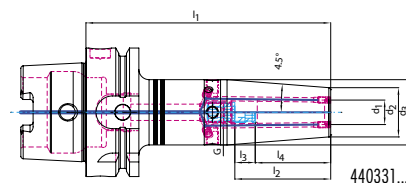
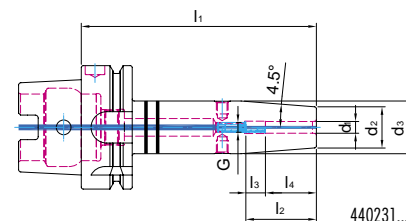
- High true running accuracy of below 0.003 mm
- Highest dimensional accuracy of the workpiece
- High torque transfer
- 4.5° range
- High contour flexibility
- Heat-resistant mild steel
- **Balanced to G 2.5 / 25,000 rpm**
- With Balluffchip bore



### HSK-A DIN 69893

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe Article No. 431011... should be used

Shank	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	Weight kg	Standard		With coolant bores	
											art.no.	€	art.no.	€
HSK 63	3	10	15	80	28	16	12	M6	2	0.7	440231 0308	170,50	440331 0308	196,50
HSK 63	4	15	22	80	28	12	16	M6	2	0.7	440231 0408	170,50	440331 0408	196,50
HSK 63	5	15	22	80	30	10	20	M6	2	0.7	440231 0508	170,50	440331 0508	196,50
HSK 63	6	21	27	80	36	10	26	M5	2.5	0.8	440231 0608	139,50	440331 0608	167,50
HSK 63	8	21	27	80	36	10	26	M6	3	0.8	440231 0808	139,50	440331 0808	167,50
HSK 63	10	24	32	85	41	10	31	M8x1	3	0.9	440231 1008	139,50	440331 1008	167,50
HSK 63	12	24	32	90	47	10	37	M10x1	5	0.9	440231 1209	139,50	440331 1208	167,50
HSK 63	14	27	34	90	47	10	37	M10x1	5	0.9	440231 1409	139,50	440331 1409	167,50
HSK 63	16	27	34	95	50	10	40	M12x1	5	1.0	440231 1609	139,50	440331 1609	167,50
HSK 63	18	33	42	95	50	10	40	M12x1	5	1.1	440231 1809	139,50	440331 1809	167,50
HSK 63	20	33	42	100	52	10	42	M16x1	5	1.1	440231 2010	139,50	440331 2010	167,50
HSK 63	3	10	20	120	-	-	12	-	-	0.8	440231 0312	214,-	440331 0312	232,-
HSK 63	4	15	22	120	-	-	16	-	-	0.8	440231 0412	214,-	440331 0412	232,-
HSK 63	5	15	22	120	-	-	20	-	-	0.8	440231 0512	214,-	440331 0512	232,-
HSK 63	6	21	27	120	36	10	26	M5	2.5	1	440231 0612	187,50	440331 0612	214,-
HSK 63	8	21	27	120	36	10	26	M6	3	1	440231 0812	187,50	440331 0812	214,-
HSK 63	10	24	32	120	41	10	31	M8x1	3	1	440231 1012	187,50	440331 1012	214,-
HSK 63	12	24	32	120	47	10	37	M10x1	5	1	440231 1212	187,50	440331 1212	214,-
HSK 63	14	27	34	120	47	10	37	M10x1	5	1.1	440231 1412	187,50	440331 1412	214,-
HSK 63	16	27	34	120	50	10	40	M12x1	5	1.1	440231 1612	187,50	440331 1612	214,-
HSK 63	18	33	42	120	50	10	40	M12x1	5	1.3	440231 1812	187,50	440331 1812	214,-
HSK 63	20	33	42	120	52	10	42	M16x1	5	1.3	440231 2012	187,50	440331 2012	214,-
HSK 63	25	44	53	115	58	10	48	M16x1	5	1.6	440231 2512	139,50	440331 2512	167,50
HSK 63	32	44	53	120	62	10	52	M16x1	5	1.6	440231 3212	139,50	440331 3212	167,50
HSK 63	3	10	20	160	-	-	12	-	-	0.8	440231 0316	233,-		
HSK 63	4	15	22	160	-	-	16	-	-	0.9	440231 0416	233,-		
HSK 63	5	15	22	160	-	-	20	-	-	0.9	440231 0516	233,-		
HSK 63	6	21	27	160	36	10	26	M5	2.5	1.1	440231 0616	213,-		
HSK 63	8	21	27	160	36	10	26	M6	3	1.1	440231 0816	213,-		
HSK 63	10	24	32	160	41	10	31	M8x1	3	1.3	440231 1016	213,-		
HSK 63	12	24	32	160	47	10	37	M10x1	5	1.2	440231 1216	213,-		
HSK 63	14	27	34	160	47	10	37	M10x1	5	1.3	440231 1416	213,-		
HSK 63	16	27	34	160	50	10	40	M12x1	5	1.4	440231 1616	213,-		
HSK 63	18	33	42	160	50	10	40	M12x1	5	1.6	440231 1816	213,-		
HSK 63	20	33	42	160	52	10	42	M16x1	5	1.6	440231 2016	213,-		
HSK 63	25	44	53	160	62	10	48	M16x1	5	2	440231 2516	213,-		
HSK 63	32	44	53	160	62	10	52	M16x1	5	1.9	440231 3216	213,-		
HSK 63	3	10	20	200	-	-	12	-	-	1	440231 0320	255,-		
HSK 63	4	15	22	200	-	-	16	-	-	1	440231 0420	255,-		
HSK 63	5	15	22	200	-	-	20	-	-	1.1	440231 0520	255,-		
HSK 63	6	21	27	200	36	10	26	M5	2.5	1.4	440231 0620	233,-		
HSK 63	8	21	27	200	36	10	26	M6	3	1.4	440231 0820	233,-		
HSK 63	10	24	32	200	41	10	31	M8x1	3	1.6	440231 1020	233,-		
HSK 63	12	24	32	200	47	10	37	M10x1	5	1.6	440231 1220	233,-		
HSK 63	14	27	34	200	47	10	37	M10x1	5	1.7	440231 1420	233,-		
HSK 63	16	27	34	200	50	10	40	M12x1	5	1.7	440231 1620	233,-		
HSK 63	18	33	42	200	50	10	40	M12x1	5	2.3	440231 1820	233,-		
HSK 63	20	33	42	200	52	10	42	M16x1	5	2.3	440231 2020	233,-		
HSK 63	25	44	53	200	62	10	48	M16x1	5	3.2	440231 2520	233,-		
HSK 63	32	44	53	200	62	10	52	M16x1	5	3	440231 3220	233,-		





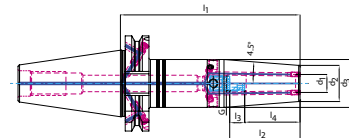
DIN ISO 7388-1 / DIN 69871 AD/AF

• Internal coolant supply

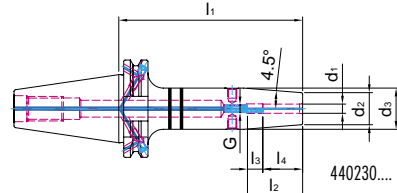
Shank	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	G mm	Wr. width mm	Weight kg	Standard		With coolant bores	
											art.no.	€	art.no.	€
SK 40	3	10	17	80	28	16	12	M6	2	0.9	440230 0308	144,-	440330 0308	192,50
SK 40	4	15	22	80	28	12	16	M6	2	0.9	440230 0408	144,-	440330 0408	192,50
SK 40	5	15	22	80	30	10	20	M6	2	0.9	440230 0508	144,-	440330 0508	192,50
SK 40	6	21	27	80	36	10	26	M5	2.5	1	440230 0608	111,-	440330 0608	141,50
SK 40	8	21	27	80	36	10	26	M6	3	1	440230 0808	111,-	440330 0808	141,50
SK 40	10	24	32	80	41	10	31	M8x1	3	1	440230 1008	111,-	440330 1008	141,50
SK 40	12	24	32	80	47	10	37	M10x1	5	1	440230 1208	111,-	440330 1208	141,50
SK 40	14	27	34	80	47	10	37	M10x1	5	1	440230 1408	111,-	440330 1408	141,50
SK 40	16	27	34	80	50	10	40	M12x1	5	1	440230 1608	111,-	440330 1608	141,50
SK 40	18	33	42	80	50	10	40	M12x1	5	1.1	440230 1808	111,-	440330 1808	141,50
SK 40	20	33	42	80	52	10	42	M16x1	8	1.1	440230 2008	111,-	440330 2008	141,50
SK 40	25	44	53	100	58	10	48	M16x1	8	1.6	440230 2508	111,-	440330 2508	141,50
SK 40	32	44	53	100	62	10	52	M16x1	8	1.4	440230 3208	111,-	440330 3208	141,50
SK 40	3	10	20	120	-	-	12	-	-	0.9	440230 0312	170,-	440330 0312	234,-
SK 40	4	15	22	120	-	-	16	-	-	1	440230 0412	170,-	440330 0412	234,-
SK 40	5	15	22	120	-	-	20	-	-	1	440230 0512	170,-	440330 0512	234,-
SK 40	6	21	27	120	36	10	26	M5	2.5	1.1	440230 0612	152,50	440330 0612	178,-
SK 40	8	21	27	120	36	10	26	M6	3	1.1	440230 0812	152,50	440330 0812	178,-
SK 40	10	24	32	120	41	10	31	M8x1	3	1.2	440230 1012	152,50	440330 1012	178,-
SK 40	12	24	32	120	47	10	37	M10x1	5	1.2	440230 1212	152,50	440330 1212	178,-
SK 40	14	27	34	120	47	10	37	M10x1	5	1.3	440230 1412	152,50	440330 1412	178,-
SK 40	16	27	34	120	50	10	40	M12x1	5	1.3	440230 1612	152,50	440330 1612	178,-
SK 40	18	33	42	120	50	10	40	M12x1	5	1.5	440230 1812	152,50	440330 1812	178,-
SK 40	20	33	42	120	52	10	42	M16x1	8	1.5	440230 2012	152,50	440330 2012	178,-
SK 40	25	44	53	120	58	10	48	M16x1	8	1.8	440230 2512	152,50	440330 2512	178,-
SK 40	32	44	53	120	62	10	52	M16x1	8	1.7	440230 3212	152,50	440330 3212	178,-
SK 40	3	10	20	160	-	-	12	-	-	1	440230 0316	188,50		
SK 40	4	15	22	160	-	-	16	-	-	1.1	440230 0416	188,50		
SK 40	5	15	22	160	-	-	20	-	-	1.1	440230 0516	188,50		
SK 40	6	21	27	160	36	10	26	M5	2.5	1.3	440230 0616	162,-		
SK 40	8	21	27	160	36	10	26	M6	3	1.3	440230 0816	162,-		
SK 40	10	24	32	160	41	10	31	M8x1	3	1.5	440230 1016	162,-		
SK 40	12	24	32	160	47	10	37	M10x1	5	1.5	440230 1216	162,-		
SK 40	14	27	34	160	47	10	37	M10x1	5	1.6	440230 1416	162,-		
SK 40	16	27	34	160	50	10	40	M12x1	5	1.6	440230 1616	162,-		
SK 40	18	33	42	160	50	10	40	M12x1	5	1.7	440230 1816	162,-		
SK 40	20	33	42	160	52	10	42	M16x1	8	1.8	440230 2016	162,-		
SK 40	25	44	53	160	58	10	48	M16x1	8	2.5	440230 2516	162,-		
SK 40	32	44	53	160	62	10	52	M16x1	8	2.4	440230 3216	162,-		
SK 40	3	10	20	200	-	-	12	-	-	1.1	440230 0320	209,-		
SK 40	4	15	22	200	-	-	16	-	-	1.2	440230 0420	209,-		
SK 40	5	15	22	200	-	-	20	-	-	1.2	440230 0520	209,-		
SK 40	6	21	27	200	36	10	26	M5	2.5	1.4	440230 0620	182,50		
SK 40	8	21	27	200	36	10	26	M6	3	1.4	440230 0820	182,50		
SK 40	10	24	32	200	41	10	31	M8x1	3	1.7	440230 1020	182,50		
SK 40	12	24	32	200	47	10	37	M10x1	5	1.7	440230 1220	182,50		
SK 40	14	27	34	200	47	10	37	M10x1	5	1.8	440230 1420	182,50		
SK 40	16	27	34	200	50	10	40	M12x1	5	1.8	440230 1620	182,50		
SK 40	18	33	42	200	50	10	40	M12x1	5	1.9	440230 1820	182,50		
SK 40	20	33	42	200	52	10	42	M16x1	8	2	440230 2020	182,50		
SK 40	25	44	53	200	58	10	48	M16x1	8	2.8	440230 2520	182,50		
SK 40	32	44	53	200	62	10	52	M16x1	8	3.2	440230 3220	182,50		

4181

4181



440330...



440230...



## diebold ThermoGrip® Shrink fit collets TER

- Optimum concentricity < 3 µm
- Good changeover accuracy
- Maximum holding forces
- Excellent dimensional stability

### • Use in collet chucks

Standard ER chucks with standard clamping nuts can be used. The collet is coolant-proof, no dirt in the slots means no soiling to the clamping taper.

### Use in powered tool holders

Clamped as short as possible, extremely rigid, no unwanted movement of the cutting tool, maximum production accuracy

### Use directly in the machine spindle

High changeover accuracy, minimal imbalance, very short design

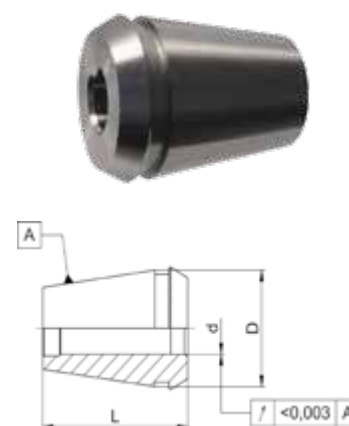


Use e.g. in collet chucks or powered tool holding fixtures

### Shrink-fit collets TER in accordance with DIN 6499

Type	d mm	D mm	L mm	art.no.	€
TER16	3	17	31	<b>430270 0317</b>	<b>78,40</b>
TER16	4	17	31	430270 0325	<b>78,40</b>
TER16	6	17	31	430270 0417	<b>71,20</b>
TER16	8	17	31	430270 0425	<b>71,20</b>
TER20	6	21	31	430270 0617	<b>74,30</b>
TER20	8	21	31	430270 0620	<b>74,30</b>
TER20	10	21	31	430270 0625	<b>74,30</b>
TER25	3	26	35	430270 0632	<b>85,50</b>
TER25	4	26	35	430270 0817	<b>85,50</b>
TER25	6	26	35	430270 0820	<b>85,50</b>
TER25	8	26	35	430270 0825	<b>85,50</b>
TER25	10	26	35	430270 0832	<b>85,50</b>
TER25	12	26	35	430270 1020	<b>85,50</b>
TER25	14	26	35	430270 1025	<b>85,50</b>
TER25	16	26	35	430270 1032	<b>85,50</b>
TER32	6	33	40	430270 1225	<b>92,60</b>
TER32	8	33	40	430270 1232	<b>92,60</b>
TER32	10	33	40	430270 1425	<b>92,60</b>
TER32	12	33	40	430270 1432	<b>92,60</b>
TER32	14	33	40	430270 1625	<b>92,60</b>
TER32	16	33	40	430270 1632	<b>92,60</b>
TER32	18	33	40	430270 1832	<b>92,60</b>
TER32	20	33	40	430270 2032	<b>92,60</b>

4131



### Inserts for TER collets

- Only for vertical shrinking units
- Available on request for horizontal shrinking units

for type	art.no.	€
TER16	<b>430290 0016</b>	<b>74,30</b>
TER20	430290 0020	<b>74,30</b>
TER25	430290 0025	<b>74,30</b>
TER32	430290 0032	<b>74,30</b>

4129



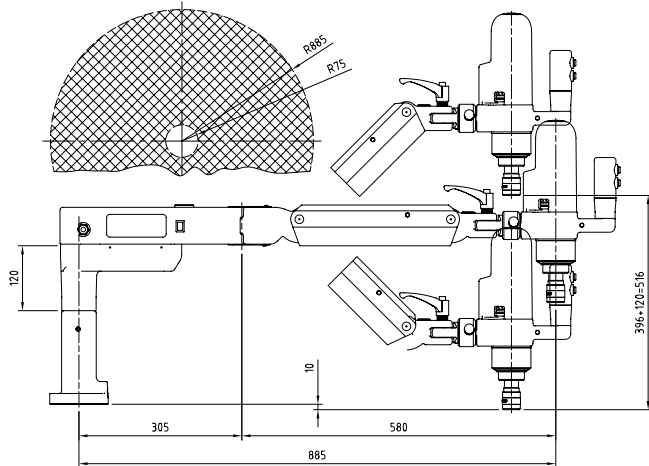
Flexible, exact, universal...

...UNICHECK.

**ATORN**<sup>®</sup>  
Performance demands quality

## ATORN® Thread cutting machine

- **Electrically powered motor**
- 220 V electrical connection is sufficient
- For M2 - M14 steel threads
- For M2 - M16 aluminium threads
- Vertical and horizontal thread cutting
- Operating range - radius 75 mm to 885 mm
- Operating range - height 565 mm
- For holding quick-release inserts with Ø 19 (e.g. art.no. 44250519..)
- Supplied with a base tool holding fixture, an articulated arm for vertical thread cutting and a tilting adapter for horizontal thread cutting (**please order quick-change chucks or quick-release inserts separately**)
- **Automatic tool lubrication and pneumatic version available on request**



### Thread cutting machine

Rotational speed r/min	Torque N-m	Holding fixture Ø mm	Connection	art.no.	€
300/600	34	19	220V	<b>442180 0001</b>	<b>5.089,-</b>
					4197

### Accessories

Designation	art.no.	€
Table clamp	<b>442181 0001</b>	<b>141,50</b>
		4197

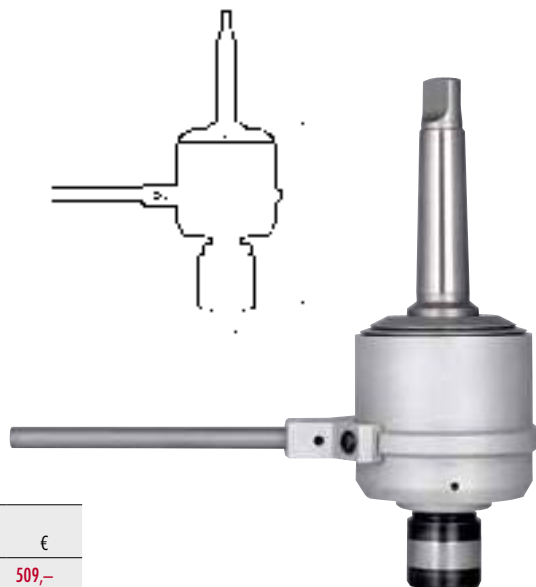


442181 0001



## SARA® Thread cutting device

- Manual thread cutting on hand-fed drills
- Maintenance-free, for use with right-hand and left-hand threads
- No need to reverse the spindle thanks to the integrated indexable thread
- Automatic shut-off by a low-wear ball system when the machine spindle is withdrawn once the thread depth has been reached
- Stopping arm must be secured against twisting before operation
- Supplied without inserts



Shank	d mm	D mm	D1 mm	L mm	L1 mm	Length compensation, pressure mm	Length compensation, tension mm	material	art.no.	€
MT 2	19	33	78	146	40	0	3.5	M3 - M12	<b>442200 1202</b>	<b>509,-</b>
MT 3	19	33	78	144	40	0	3.5	M3 - M12	442200 1203	509,-
MT 3	31	50	83	180	67	0	0	M6 - M20	442200 2003	609,-
MT 4	31	50	83	181	40	0	0	M6 - M20	442200 2004	609,-

4117

## Tap clamping sleeve

- **Torsion-free design**
- Tap clamping sleeve for machines with a synchronous thread cutting mechanism
- **Use:** In conventional DIN 1835 B (Weldon) chucks, Thread cutting in hard-to-reach areas
- Synchronisation between speed and forward thrust, no slip between the sleeve and drill bit
- 100 % cooling at the cutting edge with internal coolant supply



D mm	d mm	Quadratic mm	L mm	art.no.	€
16	3.5	2.7	56	442016 1635	36,20
16	4	3	56	442016 1640	36,20
16	4.5	3.4	56	442016 1645	36,20
16	6	4.9	56	442016 1660	36,20
20	4.5	3.4	58	442016 2045	36,20
20	6	4.9	58	442016 2060	36,20
20	7	5.5	58	442016 2070	36,20
20	8	6.2	58	442016 2080	36,20
20	9	7	58	442016 2090	36,20
20	10	8	58	442016 2010	36,20

4117

D mm	d mm	Quadratic mm	L mm	art.no.	€
25	4.5	3.4	66	442016 2545	49,60
25	6	4.9	66	442016 2560	49,60
25	7	5.5	66	442016 2570	49,60
25	8	6.2	66	442016 2580	49,60
25	9	7	66	442016 2590	49,60
25	10	8	66	442016 2510	49,60
25	11	9	66	442016 2511	49,60
25	12	9	66	442016 2512	49,60
32	6	4.9	70	442016 3260	54,-
32	7	5.5	70	442016 3270	54,-

4117

D mm	d mm	Quadratic mm	L mm	art.no.	€
32	8	6.2	70	442016 3280	54,-
32	9	7	70	442016 3290	54,-
32	10	8	70	442016 3210	54,-
32	11	9	70	442016 3211	54,-
32	12	9	70	442016 3212	54,-
32	14	11	70	442016 3214	54,-
32	16	12	70	442016 3216	54,-
32	18	14.5	70	442016 3218	54,-

4117

## SARA® Thread cutting quick-change chuck

- Automatic insert locking
- **Flexible length compensation under compression and tension**
- For quick-release inserts with adjustable safety coupling
- Minimal residual torque prevents tap breakage
- For thread cutting on mechanical and digitally controlled radial drills as well as drilling and milling machines
- Further sizes are available on request

### DIN ISO 7388-1 / DIN 69871 A

Shank	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	Thread	art.no.	€
SK 40	19	38	60	9	9	M 3 - M 12	442003 4012	180,50
SK 40	31	55	100	15	15	M 6 - M 20	442003 4024	234,-
SK 50	19	38	62	9	9	M 3 - M 12	442003 5012	270,-
SK 50	31	55	83	15	15	M 6 - M 20	442003 5024	290,-

4117

### DIN ISO 7388-2 / MAS BT JIS B 6339

Shank	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	Thread	art.no.	€
BT 40	19	38	68	9	9	M 3 - M 12	442007 4012	188,50
BT 40	31	55	93	15	15	M 6 - M 20	442007 4024	245,-
BT 50	31	55	102	15	15	M 6 - M 20	442007 5024	365,-

4117

### DIN 2080

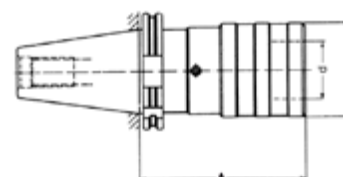
Shank	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	Thread	art.no.	€
SK 40	19	38	53	9	9	M 3 - M 12	442001 4012	214,-
SK 40	31	55	77	15	15	M 6 - M 20	442001 4024	260,-
SK 50	31	55	79	15	15	M 6 - M 20	442001 5024	336,-

4117

### Straight shank similar to DIN 1835 B+E

Shank Ø mm	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	Thread	art.no.	€
25	19	38	41	9	9	M 3 - M 12	442008 2519	185,50
25	31	55	63	15	15	M 6 - M 20	442008 2531	229,-

4117



## DIN 228

Shank	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	Thread	art.no.	€
MT 2	19	38	46	9	9	M 3 - M 12	442015 0212	162,-
MT3	19	38	46	9	9	M 3 - M 12	442015 0312	159,-
MT3	31	55	69	15	15	M 6 - M 20	442015 0324	198,50
MT 4	31	55	70	15	15	M 6 - M 20	442015 0424	198,50

4117



## SARA® Quick-release inserts

DIN  
371DIN  
376

- Further sizes available on request

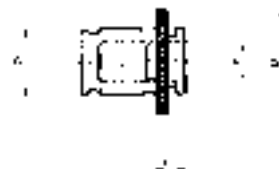
## Without coupling

d mm	Quadratic mm	D mm	L mm	D1 mm	Thread	art.no.	€
2.8	2.1	19	7	30	M 2	442501 1928	22,30
3.5	2.7	19	7	30	M 3	442501 1935	22,30
4	3.0	19	7	30	M 3.5	442501 1940	22,30
4.5	3.4	19	7	30	M 4	442501 1945	22,30
6	4.9	19	7	30	M 5 / M 6	442501 1960	22,30
8	6.2	19	7	30	M 8	442501 1980	22,30
10	8	19	7	30	M 10	442501 1910	22,30
7	5.5	19	7	30	M 10	442501 1970	22,30
9	7	19	7	30	M 12	442501 1990	22,30
11	9	19	7	30	M 14	442501 1911	22,30
6	4.9	31	11	46	M 5 / M 6	442501 3106	29,40
8	6.2	31	11	46	M 8	442501 3108	29,40
10	8	31	11	46	M 10	442501 3110	29,40
7	5.5	31	11	46	M 10	442501 3107	29,40
9	7	31	11	46	M 12	442501 3109	29,40
11	9	31	11	46	M 14	442501 3111	29,40
12	9	31	11	46	M 16	442501 3112	29,40
14	11	31	11	46	M 18	442501 3114	29,40
16	12	31	11	46	M 20	442501 3116	29,40
18	14.5	31	11	46	M 22	442501 3118	29,40

4117



Without coupling



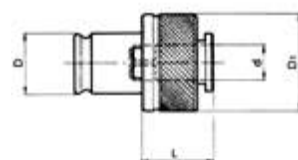
## With safety coupling

d mm	Quadratic mm	D mm	L mm	D1 mm	Thread	With adjustable coupling art.no.	€
2.8	2.1	19	25	32	M 2	442505 1928	48,40
3.5	2.7	19	25	32	M 3	442505 1935	48,40
4	3.0	19	25	32	M 3.5	442505 1940	48,40
4.5	3.4	19	25	32	M 4	442505 1945	48,40
6	4.9	19	25	32	M 5 / M 6	442505 1960	48,40
8	6.2	19	25	32	M 8	442505 1980	48,40
10	8	19	25	32	M 10	442505 1910	48,40
7	5.5	19	25	32	M 10	442505 1970	48,40
9	7	19	25	32	M 12	442505 1990	48,40
11	9	19	25	32	M 14	442505 1911	48,40
6	4.9	31	34	50	M 5 / M 6	442505 3106	71,20
8	6.2	31	34	50	M 8	442505 3108	71,20
10	8	31	34	50	M 10	442505 3110	71,20
7	5.5	31	34	50	M 10	442505 3107	71,20
9	7	31	34	50	M 12	442505 3109	71,20
11	9	31	34	50	M 14	442505 3111	71,20
12	9	31	34	50	M 16	442505 3112	71,20
14	11	31	34	50	M 18	442505 3114	71,20
16	12	31	34	50	M 20	442505 3116	71,20
18	14.5	31	34	50	M 22	442505 3118	71,20

4117



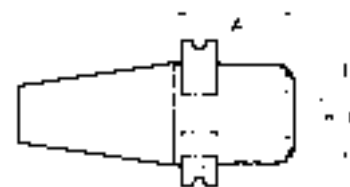
With safety coupling



## ATORN® Thread cutting quick-change chuck for synchronous spindles

- **Minimal length compensation** thanks to damping element
- Secure clamping in quick-release inserts for ER collets
- Clamping screws to prevent the clamped tap from twisting
- For use on drilling machines and machining centres with synchronous spindles

**Also available for machines with minimum-volume lubrication**



### DIN 69893 type A (HSK-A)

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe with art.no. 431011... should be used
- Supplied without quick-release insert

Shank	for collets	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	for thread	art.no.	€
HSK-A 63	ER16	20	43	64	0.2	1	M3 - M12	<b>442021 6316</b>	<b>234,-</b>
HSK-A 63	ER25	32	60	97	0.2	1	M6 - M20	<b>442021 6325</b>	<b>295,-</b>

4179



### DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply
- Supplied without quick-release insert

Shank	for collets	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	for thread	art.no.	€
SK 40	ER16	20	43	53	0.2	1	M3 - M12	<b>442020 4016</b>	<b>181,50</b>
SK 40	ER25	32	60	90	0.2	1	M6 - M20	<b>442020 4025</b>	<b>250,-</b>
SK 50	ER16	20	43	53	0.2	1	M3 - M12	<b>442020 5016</b>	<b>202,-</b>
SK 50	ER25	32	60	74	0.2	1	M6 - M20	<b>442020 5025</b>	<b>316,-</b>

4179



### Str. shank sim. to DIN 1835 B+E

- Supplied without quick-release insert

Shank	for collets	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	for thread	art.no.	€
Ø 25	ER16	20	43	34	0.2	1	M3 - M12	<b>442022 2516</b>	<b>160,-</b>
Ø 25	ER25	32	60	56	0.2	1	M6 - M20	<b>442022 2525</b>	<b>181,50</b>

4179



### Quick-release inserts, one-piece

for collets	L mm	L1 mm	D mm	D1 mm	for thread	art.no.	€
ER16	37	24	28	20	M3 - M12	<b>442025 2016</b>	<b>103,-</b>
ER25	52	28	42	32	M6 - M20	<b>442025 3225</b>	<b>124,50</b>

4179



### Quick-release inserts, two-piece

for collets	L mm	L1 mm	D mm	D1 mm	for thread	art.no.	€
ER16	55	38	28	20	M3 - M12	<b>442026 2016</b>	<b>270,-</b>
ER25	86	63	42	32	M6 - M20	<b>442026 3225</b>	<b>290,-</b>

4179



### Extension for two-piece quick-release inserts

L mm	D mm	for thread	art.no.	€
25	23	M3 - M12	<b>442027 2325</b>	<b>34,90</b>
50	23	M3 - M12	<b>442027 2350</b>	<b>40,90</b>
50	35	M6 - M20	<b>442027 3410</b>	<b>62,10</b>
100	35	M6 - M20	<b>442027 3450</b>	<b>53,40</b>

4179



Illustration shows an extended quick-release insert with two extensions

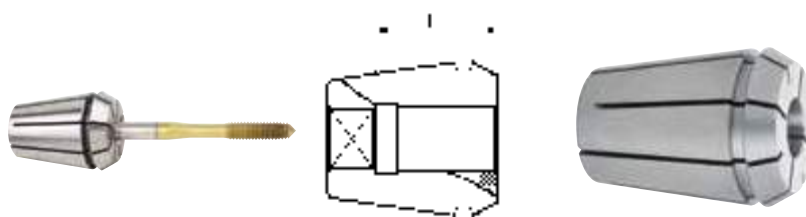




## Threading tap collet chucks, type A

**DIN 6499-A**

- With square socket
- For clamping thread cutting tools



Shank Ø mm	Quadratic mm	L mm	ER16 4031E		ER20 4276E		ER25 4282E		ER32 4537E		ER40 4716E	
			art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
3.5	2.7	18	433050 0035	34,80	433053 0035	37,20	433055 0035	38,30				
4.5	3.4	18	433050 0045	34,80	433053 0045	37,20	433055 0045	38,30	433057 0045	41,70		
5.5	4.3	18					433055 0055	38,30	433057 0055	41,70		
6	4.9	18	433050 0060	34,80	433053 0060	37,20	433055 0060	38,30	433057 0060	41,70	433059 0060	48,80
7	5.5	18	433050 0070	34,80	433053 0070	37,20	433055 0070	38,30	433057 0070	41,70	433059 0070	48,80
8	6.2	22	433050 0080	34,80	433053 0080	37,20	433055 0080	38,30	433057 0080	41,70	433059 0080	48,80
9	7	22			433053 0090	37,20	433055 0090	38,30	433057 0090	41,70	433059 0090	48,80
10	8	25			433053 0100	37,20	433055 0100	38,30	433057 0100	41,70	433059 0100	48,80
11	9	25			433053 0110	37,20	433055 0110	38,30	433057 0110	41,70	433059 0110	48,80
12	9	25			433053 0120	37,20	433055 0120	38,30	433057 0120	41,70	433059 0120	48,80
14	11	25					433055 0140	38,30	433057 0140	41,70	433059 0140	48,80
16	12	25					433055 0160	38,30	433057 0160	41,70	433059 0160	48,80
18	14.5	33									433059 0180	48,80
20	16	33									433059 0200	48,80
			4120		4120		4120		4120		4120	

## FAHRION® Thread cutting collets sealed with spray nozzles

- With square socket
- For clamping thread cutting tools
- With seals for internal coolant supply and spray nozzles

**Fahrung Protect - corrosion protection for functional surfaces in the µ area**



Shank Ø mm	Quadratic mm	L2 mm	GERC20-GBDD / 4276E		GERC25-GBDD / 4282E		GERC32-GBDD / 4537E	
			art.no.	€	art.no.	€	art.no.	€
4.5	3.55	18	433161 0450	74,30	433162 0450	77,30	433163 0450	85,50
6	5	18	433161 0600	74,30	433162 0600	77,30	433163 0600	85,50
7	5.6	18	433161 0700	74,30	433162 0700	77,30	433163 0700	85,50
8	6.3	22	433161 0800	74,30	433162 0800	77,30	433163 0800	85,50
9	7.1	22	433161 0900	74,30	433162 0900	77,30	433163 0900	85,50
10	8	25	433161 1000	74,30	433162 1000	77,30	433163 1000	85,50
11	9	25			433162 1100	77,30	433163 1100	85,50
12	9	25			433162 1200	77,30	433163 1200	85,50
14	11.2	25			433162 1400	77,30	433163 1400	85,50
16	12.5	25					433163 1600	85,50
18	14.5	30					433163 1800	85,50
			4118		4118		4118	



# Machine tap

Page 231





**bilz ER synchro insert STA**

The **STA (Synchro Tapping Adaptor)** synchro insert was specially developed for ER collet holding fixtures and allows tapping and forming on machines with synchronised spindles.

- For ER collet holding fixtures and powered tools
- Compensation for synchronisation errors
- Minimal length compensation under compression and tension
- Minimal strain on the thread flanks
- Compact design
- Internal coolant supply suitable up to 50 bar
- Suitable for left-hand and right-hand thread
- **Only used standard clamping nuts in accordance with SO15488 (DIN6499)**
- **Not for sealed nuts or mini nuts**

**Synchro tool fixture STL**

- Base support for STH synchro tool head

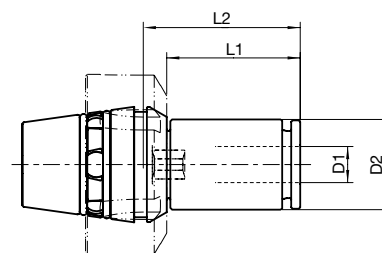
Type	Designation	art.no.	€
2	ER16	442100 0016	49,90
3	ER20	442100 0020	49,90
4	ER25	442100 0025	49,90
5	ER32	442100 0032	49,90



**Synchro tool head STH**

- Use for STL synchro tool fixture
- Length compensation: +0.5 mm / -0.2 mm

for type	D1 mm	Quadratic mm	for tap M	D2 mm	L1 mm	L2 mm	art.no.	€
2	3.5	2.7	M3 M5	12.7	24	26.3	442110 1601	49,90
2	4.5	3.4	M4 M6	12.7	24	26.3	442110 1602	49,90
2	5	4	M4 M5	12.7	24	27.3	442110 1603	49,90
3	6	4.9	M5 M6 M8	15.8	35	31	442110 2001	49,90
3	7	5.5	M7 M9 M10	15.8	35	31	442110 2002	49,90
4	6	4.9	M5 M6 M8	19	27	31	442110 2501	49,90
4	7	5.5	M7 M9 M10	19	30	33.5	442110 2502	49,90
4	8	6.2	M8 M11	19	30	34.5	442110 2503	49,90
4	9	7	M9 M12	19	40	33.5	442110 2504	49,90
5	7	5.5	M7 M9 M10	25	19	33.5	442110 3202	49,90
5	8	6.2	M8 M11	25	37	41	442110 3203	49,90
5	9	7	M9 M12	25	37	42	442110 3204	49,90
5	10	8	M10	25	37	43	442110 3205	49,90
5	6	4.9	M5 M6 M8	25	8	31	442110 3201	49,90
5	11	9	M14	25	37	44	442110 3206	49,90
5	12	9	M12 M16	25	37	44	442110 3207	49,90



**SARA® MT clamping sleeve for taps**

- For taps with straight shank and square driving pin **according to DIN 6328**
- Ground bore and external taper
- Fully hardened and ground



Morse taper	Interior Ø mm	L mm	art.no.	€
1	2.5	65.5	442017 1025	22,80
1	3.5	65.5	442017 1035	22,80
1	4.0	65.5	442017 1040	22,80
1	4.5	65.5	442017 1045	22,80
1	5	65.5	442017 1050	22,80
1	5.5	65.5	442017 1055	22,80
1	6	65.5	442017 1060	22,80
1	7	65.5	442017 1070	22,80
1	8	65.5	442017 1080	22,80
2	10	78.5	442017 2100	27,10
2	11	78.5	442017 2110	27,10
2	12	78.5	442017 2120	27,10
2	4.5	78.5	442017 2045	27,10

Morse taper	Interior Ø mm	L mm	art.no.	€
2	6	78.5	442017 2060	27,10
2	7	78.5	442017 2070	27,10
2	8	78.5	442017 2080	27,10
2	9	78.5	442017 2090	27,10
3	10	98	442017 3100	36,30
3	11	98	442017 3110	36,30
3	12	98	442017 3120	36,30
3	14	98	442017 3140	36,30
3	16	98	442017 3160	36,30
3	8	98	442017 3080	36,30
3	9	98	442017 3090	36,30
4	12	123	442017 4120	61,90
4	14	123	442017 4140	61,90

Morse taper	Interior Ø mm	L mm	art.no.	€
4	16	123	442017 4160	61,90
4	18	123	442017 4180	61,90
4	20	123	442017 4200	61,90
4	22	123	442017 4220	61,90
4	25	123	442017 4250	61,90
5	22	156	442017 5220	105,50
5	25	156	442017 5250	105,50
5	28	156	442017 5280	105,50
5	30	156	442017 5300	105,50
5	32	156	442017 5320	105,50
5	36	156	442017 5360	105,50

4107

4107

4107

## ROHM Precision clamp with quick adjustment

### • Quick adjustment

- Maximum accuracy
- Made from alloyed tool steel, hardened and finely ground on all sides
- Easy to clamp and release with a hex key
- Clamping jaw can be adjusted in steps; engages automatically
- Pull-down effect
- Suitable for grinding, milling and engraving machines, jig boring machines, measuring and inspection work, and any production processes that demand the highest clamping accuracy



### Horizontal V-block

Jaw width mm	Clamping width mm	Jaw height mm	Total height mm	Total length mm	Perpendicularity mm	Parallelism $\mu\text{m}$	art.no.	€
34	25	15	35	75	0.005	0.002	<b>463004 0030</b>	<b>137,50</b>
45	50	20	45	110	0.005	0.002	463004 0045	178,-

4190

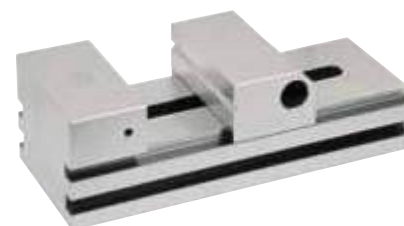


### Horizontal and vertical V-block

- Size 0120 only horizontal V-block

Jaw width mm	Clamping width mm	Jaw height mm	Total height mm	Total length mm	Perpendicularity mm	Parallelism $\mu\text{m}$	art.no.	€
70	80	30	62	160	0.005	0.002	<b>463006 0070</b>	<b>278,-</b>
90	120	40	80	210	0.005	0.002	463006 0090	355,-
120	150	40	90	280	0.005	0.002	463006 0120	475,-

4190



## ROHM Precision clamp

- Maximum accuracy
- Made from alloyed tool steel, hardened and finely ground on all sides
- Clamping and loosening via threaded spindle
- Horizontal V-block
- Suitable for grinding, milling and engraving machines, jig boring machines, measuring and inspection work, and any production processes that demand the highest clamping accuracy

Jaw width mm	Clamping width mm	Jaw height mm	Total height mm	Total length mm	Perpendicularity mm	Parallelism $\mu\text{m}$	art.no.	€
60	55	25	50	110	0.005	0.002	<b>463021 0060</b>	<b>236,-</b>
73	100	30	67	210	0.005	0.002	463021 0070	297,-
88	125	40	80	250	0.005	0.002	463021 0090	355,-

4190



## SARA® Precision vices

- Pull-down fixture
- One-piece vice bed and fixed jaw
- Angularity and parallelism 0.005 mm / 100 mm, can be used on all sides
- Alloyed case-hardened tool steel, hardened and finely ground, hardness HRC 58 - 62

Jaw width mm	L mm	Jaw opening mm	Jaw height mm	art.no.	€
50	140	65	25	<b>463007 1050</b>	<b>126,50</b>
63	175	85	32	463007 0063	162,-
73	190	100	35	463007 0073	182,50
88	235	125	40	463007 0088	234,-
100	245	125	45	463007 0100	245,-

4152



## SARA® Precision grinding and inspection vices

### • With spindle

- Entirely made from steel, precision-ground on all sides, can be used on all four sides, hardness HRC 58 - 62
- Can be used on grinding machines, jig boring machines and other precision machinery
- Also for measuring and inspection work
- Tolerance 0.005 mm



Jaw width mm	L mm	Jaw opening mm	Jaw height mm	art.no.	€
50	155	65	25	<b>463024 0050</b>	<b>183,50</b>
63	190	85	32	463024 0063	198,50
73	210	100	35	463024 0073	247,-
88	250	125	40	463024 0088	295,-
100	260	125	45	463024 0100	450,-

4152

## SARA® Precision sinus vice

- Machining and checking of surfaces and angular surfaces
- Angle adjustment in 2 axes via Vernier scale and precision set screw
- Can be rotated horizontally by 360°
- Can be swivelled vertically by 2 x 60°
- Scale reading from Vernier 3'
- Tool steel, through-hardened, fully precision-ground
- Perpendicularity: 0,005/100 mm
- Parallelism: 0,005/100 mm



Jaw width mm	Clamping width mm	Jaw height mm	L mm	Height mm	Weight kg	art.no.	€
70	80	30	160	137	12	<b>459026 0070</b>	<b>1.529,-</b>

4152

## ATORN® Drilling machine vice

- Clamping jaws offset for clamping flat workpieces
- Horizontal and vertical V-blocks are integrated into the fixed jaw for round material

Jaw width mm	Jaw height mm	Clamping width mm	art.no.	€
80	25	65	<b>451540 0085</b>	<b>66,80</b>
100	30	90	451540 0100	89,-
120	30	110	451540 0120	111,50
150	40	150	451540 0150	170,50

4150

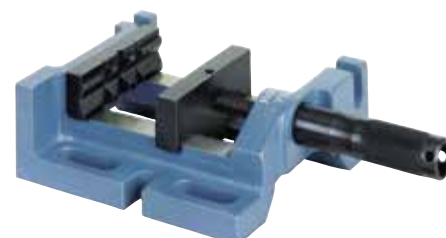


## RÖHM Drilling machine vice with three clamping options

- **Version with two additional, rectangular supporting surfaces**
- Three clamping options (base, right-hand and face)
- Clamping jaws offset for clamping flat workpieces
- Horizontal and vertical V-blocks are integrated into the fixed jaw for round material

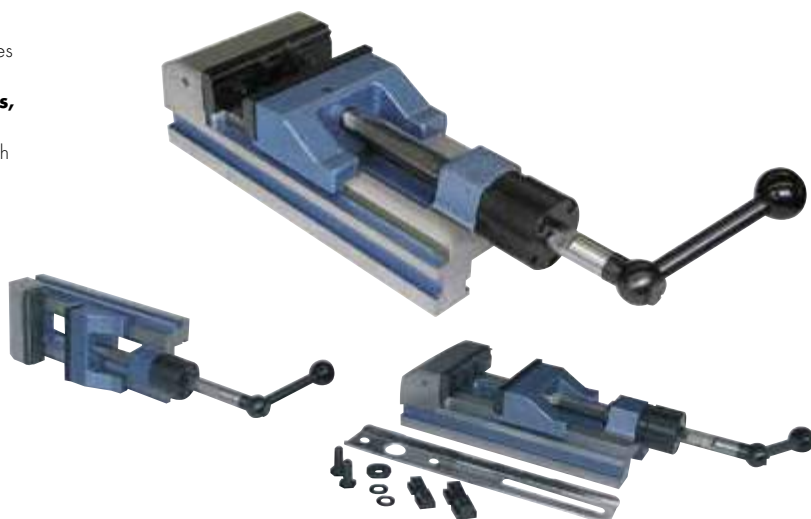
Jaw width mm	Clamping width mm	art.no.	€
100	93	<b>451545 0100</b>	<b>79,90</b>

4190



## ATORN® Drilling machine vice with quick jaw adjustment

- Narrow version
- For quick and secure clamping, particularly when machining workpieces for mass production
- With guideway, **base clamping and lateral clamping devices**, also suitable for light milling work
- **One-handed operation** - quick jaw adjustment and clamping with just one lever handle
- Flat, robust design
- Max. clamping force 10 kN
- Positive-fit locking
- Large clamping range
- Body made from special cast iron
- Supplied with guideway and fixing materials



Jaw width mm	Clamping width mm	max. clamp force kN	L mm	H mm	H1 mm	Weight kg	art.no.	€
110	130	10	280	82	50	12.5	<b>451560 0110</b>	<b>529,-</b>
135	160	10	328	90	50	19	451560 0135	<b>639,-</b>

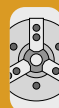
4144

## ATORN® Parallel vice, steel

- Forged steel
- Opens to the front
- Concealed spindle
- Anvil and work top ground
- Jaws hardened and milled
- Sliding parts hardened and ground
- Hammer-finish paint, blue

Jaw width mm	Clamping range mm	l4 mm	Weight kg	art.no.	€
100	140	75	7	<b>450115 0100</b>	<b>119,-</b>
125	150	80	11	450115 0125	<b>147,50</b>
150	200	120	17	450115 0150	<b>214,-</b>

4142



## ATORN® Parallel vice, cast iron

- High-quality grey cast iron
- Opens to the rear
- Trapezoidal thread spindle protected against dirt
- Anvil with ground finish
- Reversible steel jaws, 1 side grooved, 1 side smooth
- Hammer-finish paint, blue (available in green on request)

Jaw width mm	Clamping range mm	l4 mm	Weight kg	art.no.	€
100	140	75	13	<b>450125 0100</b>	<b>234,-</b>
125	175	80	24	450125 0125	<b>275,-</b>
150	250	90	41	450125 0150	<b>480,-</b>

4141



## Magnetic vice jaws

- **Compatible with all vice models**
- With integrated permanent magnets
- Material: Aluminium
- Further jaw widths from 80-200 mm as well as felt types available on request

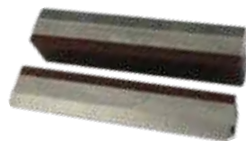


### Aluminium protective jaw with rubber coating

- 1 pair

Jaw width mm	art.no.	€
100	<b>452102 0100</b>	<b>25,80</b>
125	452102 0125	29,10
150	452102 0150	32,50

4140



### Aluminium protective jaw with fibre coating

- Price per pair

Jaw width mm	art.no.	€
100	<b>452100 0100</b>	<b>25,80</b>
125	452100 0125	29,10
150	452100 0150	32,50

4140



### Aluminium protective jaw, smooth surface

- Price per pair

Jaw width mm	art.no.	€
100	<b>452103 0100</b>	<b>18,95</b>
125	452103 0125	22,80
150	452103 0150	26,50

4140



### Aluminium protective jaw, horizontal and vertical V-block 12 mm

- Price per pair

Jaw width mm	art.no.	€
100	<b>452105 0100</b>	<b>27,40</b>
125	452105 0125	29,70
150	452105 0150	32,60

4140

## Protective vice jaws

- For parallel vices
- With replaceable inserts
- Made from a variety of materials



### Protective jaw holder

- Price per pair

Jaw width mm	art.no.	€
100	<b>452010 0100</b>	<b>24,60</b>
125	452010 0125	28,30
135	452010 0135	30,20
150	452010 0150	32,10

4140



### Polyamide inserts

- Price per pair

Jaw width mm	art.no.	€
100	<b>452011 0100</b>	<b>10,55</b>
125	452011 0125	13,20
135	452011 0135	14,35
150	452011 0150	16,20

4140



### Aluminium inserts

- Price per pair

Jaw width mm	art.no.	€
100	<b>452012 0100</b>	<b>15,90</b>
125	452012 0125	17,-
135	452012 0135	18,15
150	452012 0150	19,95

4140



### Fibre inserts

- Price per pair

Jaw width mm	art.no.	€
100	<b>452013 0100</b>	<b>15,10</b>
125	452013 0125	16,20
135	452013 0135	17,-
150	452013 0150	18,85

4140



### Polyamide V-block inserts

- Price per pair

Jaw width mm	art.no.	€
100	<b>452015 0100</b>	<b>39,60</b>
125	452015 0125	49,10
135	452015 0135	52,90
150	452015 0150	60,60

4140

## ATORN® Workpiece stop, T-slot

- Adjustable through five axes
- For use on drilling and milling machines
- Quick to set, flexible, sturdy
- 12 and 14 mm T-slot nuts with M8 thread



Designation	art.no.	€
Workpiece stop with T-slot nuts 12 and 14 mm	<b>466597</b> 0001	<b>203,-</b>
	4140	

### T-slot nut for workpiece stop

Designation	art.no.	€
T-slot nut 14 mm	<b>466594</b> 0014	<b>3,34</b>
T-slot nut 16 mm	466594 0016	<b>5,40</b>
T-slot nut 18 mm	466594 0018	<b>6,55</b>
	4158	

## SARA® Workpiece stop, magnetic

- Compatible with all vices
- No threaded bores required
- Stop rod length 125 mm
- Adjustable fixing magnets



Total height mm	art.no.	€
100	<b>466596</b> 0001	<b>106,-</b>
	4117	



Multiple clamping ...

... precise and powerful.

**ATORN®**  
Performance demands quality



## ATORN® Cover for boreholes and screw heads with hex key

NEW

- prevents chips from sticking and cooling lubricants from accumulating in screw head and countersink
- increased occupational safety through working and cleaning with compressed air
- faster set-up due to less cleaning effort
- patented reusable system
- suitable for the clamping systems in the catalogue
- special sizes available on request



### Aluminium cover

Description	art.no.	€
10 x cover M10	438110 0010	76,30
10 x cover M12	438110 0012	76,30
10 x cover M16	438110 0016	96,70
5 x cover M20	438110 0020	56,-

4183

## ATORN® Clamping jaws with positioning pins

- Fast and precise machining of various workpieces
- Retooling in seconds for various machining tasks
- Loose underlays are no longer needed, nor is time-consuming cleaning
- Stable and robust lightweight design
- Also suitable for high clamping forces.
- Compressed air flow via vents on both front faces
- Recommended air pressure: 5.5 bar
- Closed on all sides when installed, so very low-maintenance
- Premium tool steel, hardened, ground and treated with a special oxidation process

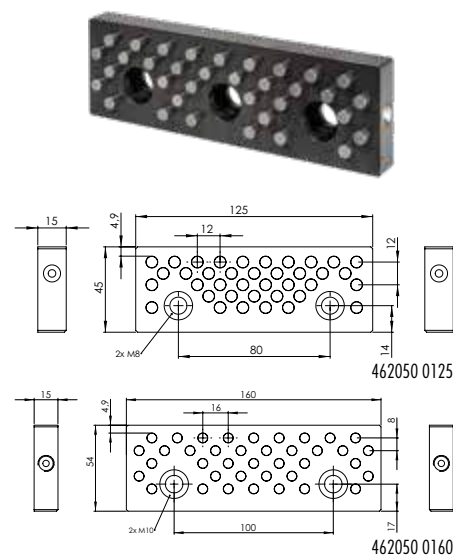


### Clamping jaws for Hilma

- Hima NC125/160, EL125/160, KNC125/160

Jaw width mm	art.no.	€
125	462050 0125	280,-
160	462050 0160	385,-

4183

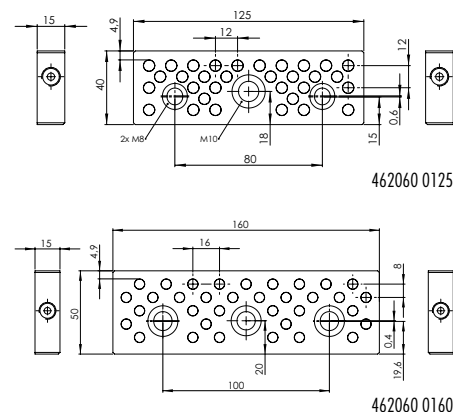


### Clamping jaws for ATORN, Allmatic, Röhme, Gressel, Kesel

- ATORN MM-G 125/160
- Allmatic 125/160
- Arno 125/160
- Gressel Gripos 125/160, Grepos-5X, Grefors, Duogrip, Ecosol, C2
- Röhme RKE 125/160, RKG 125/160

Jaw width mm	art.no.	€
125	462060 0125	280,-
160	462060 0160	385,-

4183





## SARA® Gripper jaws with support bar

- Hardened tool steel
- **Variable support height 3 mm and 5 mm** by simply turning the support bar

### For ATORN MM-G, RöhM RKG-M, RKD, RKE and Allmatic Basic

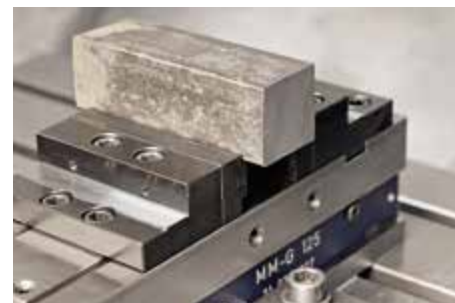
- Price per pair

Jaw width mm	art.no.	€
125	<b>461020</b> 0125	<b>270,-</b>
	4166	

### For Hilma-NC and EL

- Price per pair

Jaw width mm	art.no.	€
125	<b>461021</b> 0125	<b>270,-</b>
	4166	



**EVEN WORKS BACKWARDS.**

**SIMPLY INPUT THE DIMENSIONS, AND YOU'RE DONE:**

**CLAMPING JAWS FINDER**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**  
**POWER TO PRODUCE**  
 A BRAND OF SARTORIUS WERKZEUGE

## SARA® Parallel underlays sets

- All surfaces are plane-parallel, rectangular and ground in pairs
- Height tolerance  $\pm 0.01$  mm
- For height adjustment when clamping workpieces; particularly suitable for seating in machine vices, marking tables or machine tools
- Supplied in a wooden box



Contents	L mm	Width mm	Height mm	art.no.	€
8 pairs	120	8	12, 17, 22, 25, 28, 32, 36, 38	<b>465002</b> 1208	<b>214,-</b>
8 pairs	160	8	12, 17, 22, 25, 28, 32, 36, 38	465002 1608	<b>265,-</b>
9 pairs	100	4	10, 14, 18, 22, 26, 30, 34, 38, 42	465002 1004	<b>224,-</b>
9 pairs	160	4	10, 14, 18, 22, 26, 30, 34, 38, 42	465002 1604	<b>265,-</b>

4153

## ATORN® Parallel supports, magnetic

- Hardened tool steel
- Burnished
- Height tolerance  $\pm 0.01$  mm
- 2.5 mm wide, allowing bores to be drilled near vice jaws

### Single

Jaw width mm	Height mm	art.no.	€
125	20	<b>465006</b> 1220	<b>73,30</b>
125	25	465006 1225	<b>73,30</b>
125	30	465006 1230	<b>73,30</b>
125	37	465006 1237	<b>73,30</b>
125	39	465006 1239	<b>73,30</b>

4183

### Sets

Jaw width mm	Contents per set	art.no.	€
100	Height 20, 27, 29, 31, 32 mm	<b>465006</b> 0100	<b>345,-</b>
125	Height 15, 30, 35, 37, 39 mm	465006 0125	<b>370,-</b>
160	Height 22, 30, 37, 42, 47 mm	465006 0160	<b>385,-</b>

4183



## Parallel support sets

- **In a wooden stand**
- Aged steel, case-hardened and ground in pairs
- Pair tolerance height  $\pm 0.01$  mm
- Machined to plane-parallel and true-angle finish
- The cross section is stamped into the ground front face
- For use as parallel workpiece mounts in machine vices, marking tables or machine tools for drilling, grinding, milling, planing, marking and measuring; especially suitable for holding in machine vices, marking tables or machine tools

L mm	Pair/set increasing at intervals of 1 mm	Cross section mm	art.no.	€
125	24 pairs, 8-42 (except 9 mm)	8x11 8x16 8x21 8x26 8x31 8x36, 10x13 10x18 10x23 10x28 10x33 10x38, 12x15 12x20 12x25 12x30 12x35 12x40, 14x17 14x22 14x27 14x32 14x37 14x42	<b>465005</b> 0025	<b>549,-</b>
150	24 pairs, 8-42 (except 9 mm)	8x11 8x16 8x21 8x26 8x31 8x36, 10x13 10x18 10x23 10x28 10x33 10x38, 12x15 12x20 12x25 12x30 12x35 12x40, 14x17 14x22 14x27 14x32 14x37 14x42	465005 0050	<b>569,-</b>

4153



## SARA® Mechanical precision machine vice

- Mechanical precision vice
- Accuracy: within 0.02 mm
- Base body made from hardened steel, 60 HRC
- Fixed jaw can be rotated 180°; equipped with a jaw step on the reverse side
- Supplied with stop, clamping claws, 16 x 16 mm slot nuts and chuck key

A mm	B mm	C mm	D mm	E mm	F mm	G mm	L mm	Weight kg	art.no.	€
125	40	150	345	410	40	95	16	12.9	460200 0125	699,-
150	50	200	420	500	50	125	16	25.5	460200 2150	759,-
150	50	300	520	600	50	125	16	29	460200 3150	869,-
175	60	200	455	530	58	145	16	37	460200 2175	1.059,-
175	60	300	555	630	58	145	16	42	460200 3175	1.139,-
175	60	400	655	730	58	145	16	47	460200 4175	1.319,-
200	65	300	595	680	70	170	16	69	460200 3200	1.609,-
200	65	400	695	780	70	170	16	74	460200 4200	1.879,-
300	80	300	635	730	78	195	16	130	460200 3300	2.599,-
300	80	400	735	830	78	195	16	140	460200 4300	3.099,-

4170

### Swivel base with degree setting

suitable for jaw width mm	Angle precision	art.no.	€
125	1°	460222 0125	365,-
150	1°	460222 0150	430,-
175	1°	460222 0175	470,-
200	1°	460222 0200	699,-
300	1°	460222 0300	859,-

4171

### Slot nuts

- Price per pair

Groove dimensions device mm	Groove dimensions machine mm	art.no.	€
16	10	460213 1610	29,50
16	12	460213 1612	29,50
16	14	460213 1614	29,50
16	16	460213 1616	29,50
16	18	460213 1618	29,50
16	20	460213 1620	29,50
16	22	460213 1622	29,50
16	24	460213 1624	29,50
16	28	460213 1628	29,50
16	36	460213 1636	29,50

4171

### V-block jaw

- Price per unit

suitable for jaw width mm	art.no.	€
125	460217 0125	123,50
150	460217 0150	175,-
175	460217 0175	265,-
200	460217 0200	346,-
300	460217 0300	629,-

4171



### Clamping jaw, extra high

- Price per unit

suitable for jaw width mm	art.no.	€
125	460224 0125	214,-
150	460224 0150	245,-
175	460224 0175	341,-
200	460224 0200	480,-
300	460224 0300	759,-

4171



### Coordinate V-jaw

- Price per unit

suitable for jaw width mm	art.no.	€
125	460223 0125	316,-
150	460223 0150	399,-
175	460223 0175	569,-
200	460223 0200	799,-
300	460223 0300	1.189,-

4171

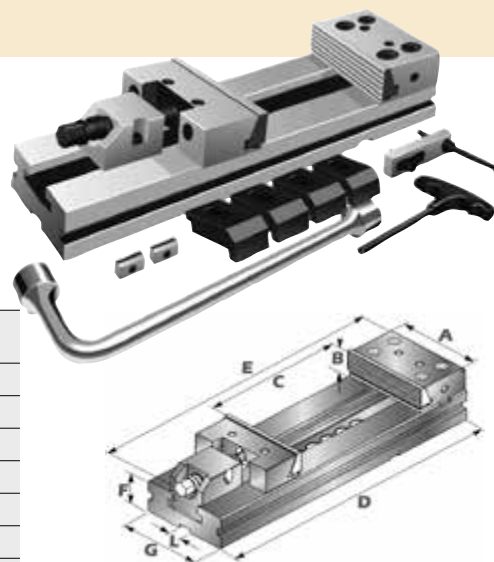
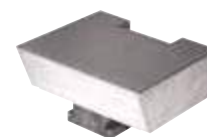


### Pull-down jaw

- Price per unit

suitable for jaw width mm	art.no.	€
125	460225 0125	186,50
150	460225 0150	229,-
175	460225 0175	265,-
200	460225 0200	375,-
300	460225 0300	559,-

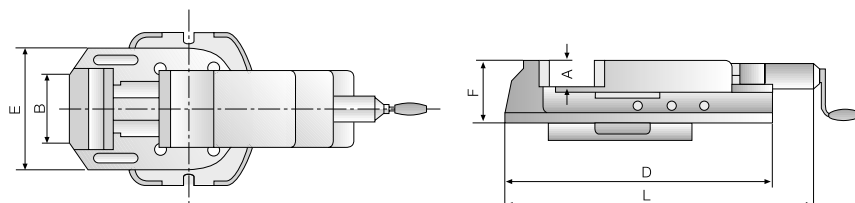
4171





## High-pressure machine vice

- **Mechanical/mechanical** or **mechanical/hydraulic**
- Base body and clamping jaw holder made from high-quality ductile iron, GJS 70
- Clamping precision within 0.01 mm at the same clamping pressure
- Both clamping areas can be roughly set in a matter of seconds via bolts (covered clamping areas)
- Aligned on the work table via longitudinal or transverse slots (20H7) in the base surface
- All wearing parts, clamping jaws and guideways hardened and ground (60 HRC)
- Multiple vices of the same height are available with a **pair accuracy of 0.01 mm**
- Spindle can be optionally replaced with a pneumatic/hydraulic version
- Supplied with 1 pair of smooth jaws and 1 hand crank, **without swivel base**



Jaw width mm	Clamp force kN	Clamping range mm	A mm	D mm	E mm	F mm	L mm	Weight kg	mech./hydr. art.no.	€	mech./mech. art.no.	€
125	40	0 - 205	40	425	195	107	480 - 685	26	<b>458601</b> 0125	<b>1.649,-</b>	<b>458603</b> 0125	<b>1.699,-</b>
160	50	0 - 305	50	570	250	130	565 - 870	51	458601 0160	<b>2.119,-</b>	458603 0160	<b>2.159,-</b>
200	80	0 - 375	63	680	300	160	720 - 1095	94	458601 0200	<b>3.189,-</b>	458603 0200	<b>3.239,-</b>
									4143		4143	

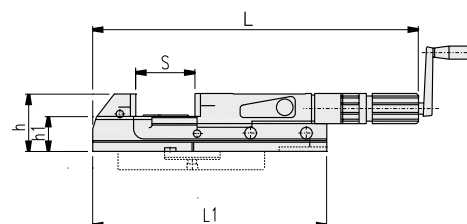
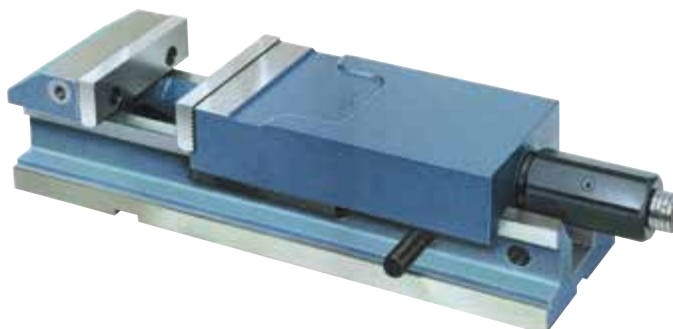
### Turning insert

- **Note:** Angular accuracy is only guaranteed when purchased with vice!

Jaw width mm	art.no.	€
125	<b>458606</b> 0125	<b>331,-</b>
160	458606 0160	<b>399,-</b>
200	458606 0200	<b>455,-</b>
		4143

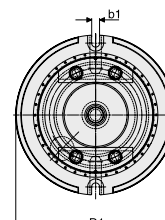
## ATORN® High-pressure machine vice

- **Mechanical/hydraulic**
- Steel base body
- Guideways hardened and ground
- Aligned on the work table via longitudinal or transverse slot 20 H7
- Quick adjustment via bolts
- Setting mechanism for quickly pre-selecting the clamping force
- Supplied with 1 set of smooth jaws, 4 clamping claws and a hand crank



### Vice

Jaw width mm	Clamp force kN	L mm	L1 mm	h mm	h1 mm	S mm	art.no.	€
90	25	553	370	99	53	150	<b>457100</b> 0090	<b>1.669,-</b>
125	40	681	470	112	70	220	457100 0125	<b>1.969,-</b>
								4183



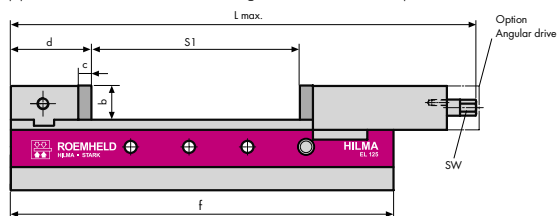
### Turning insert

Jaw width mm	D1 mm	b1 mm	art.no.	€
90	242	14	<b>457101</b> 0090	<b>399,-</b>
125	280	16	457101 0125	<b>519,-</b>
				4183



**ROEMHELD EuroLine NC high-pressure machine vice**

- **Type EL, mechanical-hydraulic**
- **Dependable and cost-effective**
- Threaded bores for workpiece stops in both sides of the fixed jaw as standard
- Replaceable, hardened clamping jaws (1st side smooth, 2nd side grooved)
- Guideways hardened and ground
- Desired clamping range can be roughly pre-selected via socket pin
- Spindle and power transmission integrated and protected inside the slide body
- Straightforward maintenance and cleaning: the slide body can be removed in a single action
- For tool and mould making, fixture construction, production

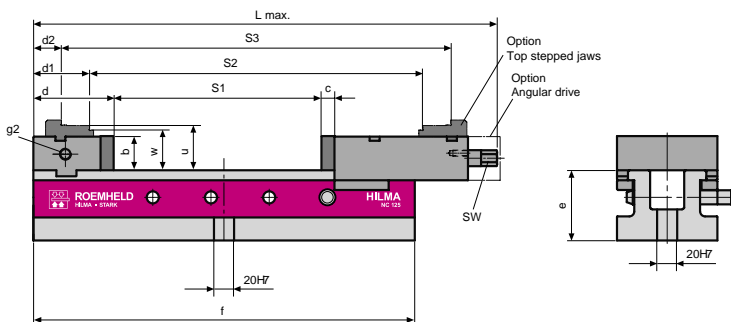


Jaw width mm	Clamp force kN	Crank force N	Clamp width S1 mm	L max. mm	Weight kg	b mm	c mm	d mm	f mm	art.no.	€
100	25	50	205	464	18.5	34	13	80	380	457001 2100	1.559,-
125	40	75	225	526	31.5	45	15	100	430	457001 2125	1.599,-
160	50	95	309	684	58.5	54	18	120	550	457001 2160	2.279,-

4146

**ROEMHELD NC NC high-pressure machine vice**

- **Type NC, mechanical-hydraulic**
- **Versatile and flexible**
- Longitudinal and transverse slots as standard for quick positioning
- Slots and threaded bores on slide and fixed jaw for holding standard and special large-span jaws
- Threaded bores on both sides for workpiece stops
- Clamping edge for clamping claws
- Guideways hardened and ground
- Desired clamping range can be roughly pre-selected via socket pin
- Resistant to deformation thanks to the new bottom cross section and new fixed jaw
- Mounting hole layout for extra high clamping jaws
- For tool and mould making, fixture construction, production
- Supplied with standard smooth/grooved indexable jaws, hand crank, operating manual
- **Longer versions and clamping force monitoring available on request (cannot be retrofitted!)**



Type NCH, hydraulically operated - available on request

Jaw width mm	Clamp force kN	Crank force N	Crank radius mm	Clamp width S1 mm	Clamp width S2 mm	Clamp width S3 mm	L mm	b mm	c mm	d mm	e mm	d1 mm	d2 mm	u mm	w mm	Weight kg	art.no.	€
100	25	50	80	205	330	386	464	34	13	80	78	56	28	45	40	18.5	457020 0100	1.859,-
125	40	75	100	225	363	431	526	45	15	100	82	69	35	58	53	31.5	457020 0125	2.049,-
160	50	95	125	309	503	573	684	54	18	120	95	72	37	70	65	58.5	457020 0160	2.699,-

4146

**Top stepped jaws for type NC**

- For extremely large clamping widths
- Includes fastening screws
- Unit prices

Jaw width mm	Height mm	l4 mm	for fixed jaws art.no.	€	for slides art.no.	€
100	16.5	5	457503 0100	198,50	457504 0100	205,-
125	19	5	457503 0125	206,-	457504 0125	215,-
160	22	5	457503 0160	231,-	457504 0160	251,-

4146

4146



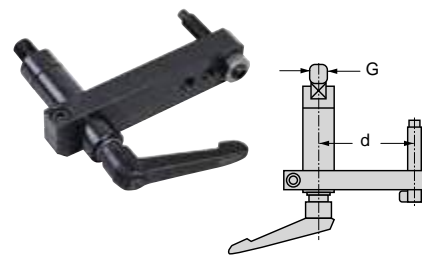
**ROEMHELD** Accessories for Hilma KNC / NC / EL  
HILMA • STARK

**Precision workpiece stop for type EL, NC, KNC**

- Can be swivelled out of the way, features quick-action clamp
- 2 level adjustment

Jaw width mm	d mm	Thread	art.no.	€
100/125	95	M 12	458515 1012	95,10
160	124	M 20	458515 1620	125,50

4145



**Angular drive for type EL, NC**

- For mechanical-hydraulic machine vices and clamping systems
- Used when normal operation is hindered or not possible
- Also ideal for retrofitting

Jaw width mm	a mm	Crank radius mm	Wr. width mm	art.no.	€
100	39	125	10	458501 0100	385,-
125	43	125	10	458501 0125	425,-
160	46	125	10	458501 0160	470,-

4145



**Clamping claws with screws, for type EL and NC**

- Price per set of 4 units

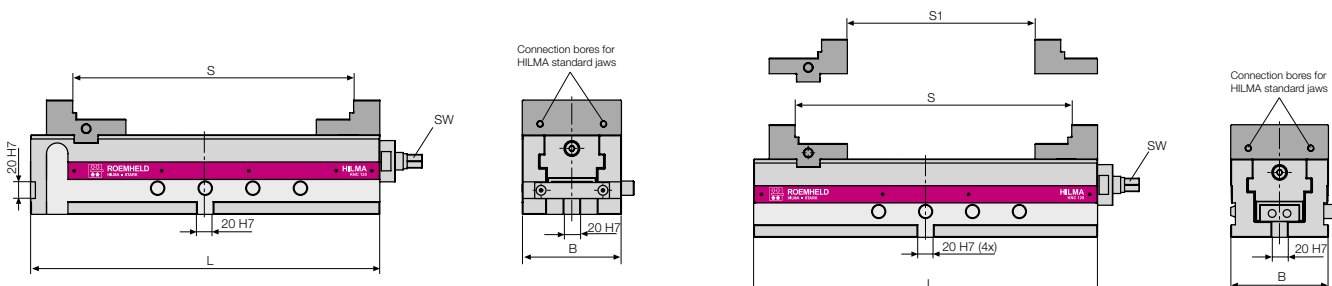
suitable for	Screw	Clamping height mm	art.no.	€
NC 100	M 12 X 45 DIN 912	24	458520 1012	98,70
NC 125/160	M 12 X 45 DIN 912	27	458520 1016	99,70
NC 160	M 16 X 50 DIN 912	27	458520 1600	101,-

4145



**ROEMHELD** KNC NC high-pressure machine vice  
HILMA • STARK

- **KNC type, mechanical-hydraulic**
- **For the toughest requirements**
- Fully encapsulated spindle and power transmission, reliable protection against chips
- With stepped indexable jaws as standard, smooth rear side, with connection bores for almost all HILMA clamping jaw systems
- Desired clamping range can be roughly pre-selected via socket pin
- Locking device for mechanically clamping sensitive workpieces (optional accessories)
- All-steel design with internal slide guide
- 20 H7 cross slots for horizontal clamping



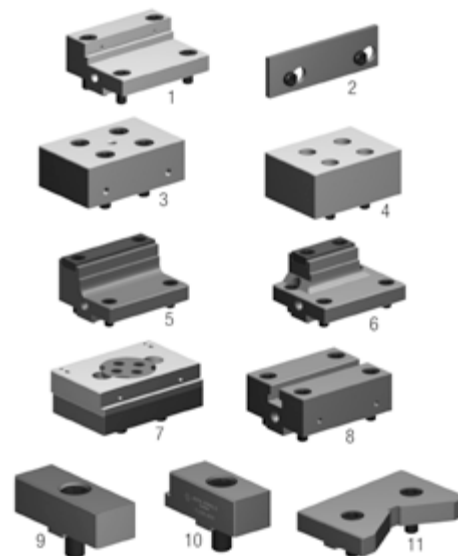
Type	Jaw width mm	Clamp force kN	Crank radius mm	L mm	Clamping width mm	Clamp width S1 mm	Weight kg	art.no.	€
Standard	100	25	80	300	230	140	17	457080 0100	2.129,-
Standard	125	40	106	440	354	240	35	457080 0125	2.349,-
Standard	160	50	125	540	436	300	72	457080 0160	3.099,-
Universal	100	25	80	300	230	140	17	457080 1100	2.449,-
Universal	125	40	106	440	354	240	35	457080 1125	2.749,-
Universal	160	50	125	540	436	300	72	457080 1160	3.489,-

4146

## Clamping jaws

- Price per unit

Description	Illustration	Jaw width 100		Jaw width 125		Jaw width 160	
		art.no.	€	art.no.	€	art.no.	€
Stepped indexable jaw, fixed	1	457081 0010	159,-	457082 0010	204,-	457083 0010	267,-
Stepped indexable jaw, movable	1	457081 0011	147,50	457082 0011	193,50	457083 0011	250,-
Finely stepped strip, standard	2	457081 0020	44,10	457082 0020	46,30	457083 0020	54,-
Finely stepped strip, low	2	457081 0021	44,10	457082 0021	46,30	457083 0021	54,-
Block jaw, hardened, fixed	3	457081 0030	226,-	457082 0030	261,-	457083 0030	360,-
Block jaw, hardened, movable	3	457081 0031	220,-	457082 0031	253,-	457083 0031	345,-
Block jaw, soft, fixed	4	457081 0040	132,50	457082 0040	182,50	457083 0040	248,-
Block jaw, soft, movable	4	457081 0041	116,-	457082 0041	164,-	457083 0041	222,-
Clamping jaw, extra high, fixed	5	457081 0050	277,-	457082 0050	329,-		
Clamping jaw, extra high, movable	5	457081 0051	253,-	457082 0051	289,-		
Clamping jaw, extra high, offset, fixed	6	457081 0060	286,-	457082 0060	338,-		
Clamping jaw, extra high, offset, movable	6	457081 0061	264,-	457082 0061	298,-		
Pendulum jaws	7			457082 0070	485,-	457083 0070	559,-
SlimFlex jaw, fixed	8	457081 0080	271,-	457082 0080	350,-	457083 0080	440,-
SlimFlex jaw, movable	8	457081 0081	245,-	457082 0081	329,-	457083 0081	415,-
SlimFlex insert, soft	9	457081 0082	28,40				
SlimFlex step insert	10	457081 0083	52,90				
SlimFlex V-block insert	11	457081 0084	92,10				
		4146		4146		4146	



## Clamping claws with screws for type KNC

- Price per set of 4 units

suitable for jaw width mm	Clamping height mm	Screw	art.no.	€
100 / 125	16	M12 x 30	457088 1210	98,70
100 / 125	16	M16 x 40	457088 1610	98,70
160	20	M12 x 35	457088 1212	99,70
160	20	M16 x 40	457088 1216	101,-
			4146	



## Angular drive for type KNC

- For changing the direction of the hand crank

suitable for jaw width mm	Wr. width mm	art.no.	€
100	14	457084 0100	609,-
125 / 160	17	457084 0125	659,-
		4146	

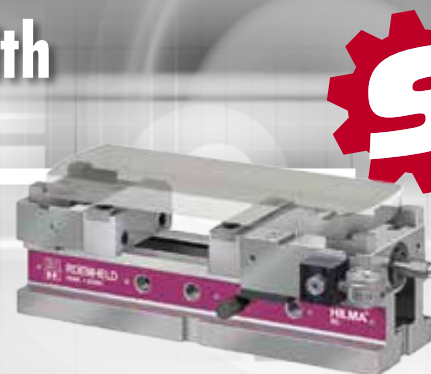


# Expand HILMA machine vices with clamping force display

Clamp raw parts with clamping bars with smooth, grip or carbide-coated replaceable insert



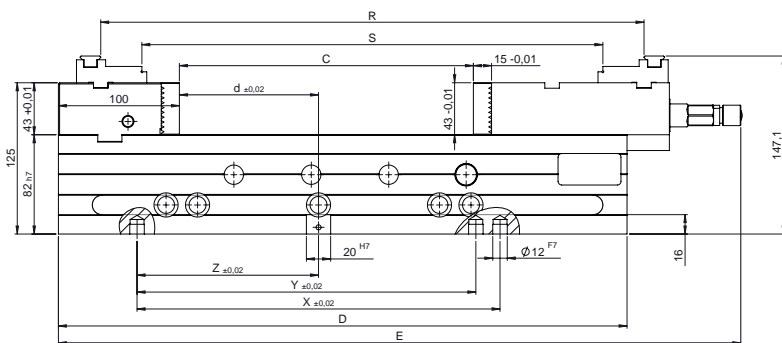
Clamp round or raw parts with grip or carbide-coated replaceable inserts for slots and fixed jaws





# ATORN® NC high-pressure machine vice MH-S 125

- **Mechanical/hydraulic**
- Robust steel base body
- Hardened and ground guideways
- Repetition precision ≤ 0,01 mm
- Versions with fastening bores for lateral clamping available on request, for bed length D = 470 mm, attachment screws for groove spacing 63 mm and 100 mm are pre-mounted
- Locating pin for quick pre-positioning
- Simple cleaning due to removable upper slides
- **Bed lengths up to 1200 mm and hydraulically-controlled versions available on request**
- Supplied with jaws and hand crank



### Standard version mech./hydr.

Jaw width mm	D mm	E mm	d mm	X mm	Y mm	Z mm	C mm	R mm	S mm	Weight kg	art.no.	€
125	470	564	115	300	280	150	0-239	131-445	63-377	37.6	<b>458100 1125</b>	<b>1.969,-</b>
125	534	628	167	400	-	200	0-303	131-509	63-441	41.7	458100 2125	<b>2.219,-</b>
125	598	692	199	500	480	250	0-367	131-573	63-505	45.1	458100 3125	<b>2.449,-</b>
125	662	756	231	500	480	250	0-431	131-637	63-569	48.5	458100 4125	<b>2.689,-</b>
125	726	820	263	500	480	250	0-495	131-701	63-633	51.9	458100 5125	<b>2.939,-</b>
125	790	884	295	500	480	250	0-559	131-765	63-697	55.3	458100 6125	<b>3.339,-</b>
125	854	984	327	500	480	250	0-623	131-829	63-761	58.7	458100 7125	<b>3.739,-</b>
125	918	1012	359	500	480	250	0-687	131-893	63-825	62.1	458100 8125	<b>4.149,-</b>

4144



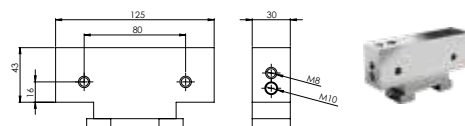
With interchangeable slider

**ATORN MH-S with interchangeable slider for multiple clamping**

### Interchangeable slider

Jaw width mm	art.no.	€
125	<b>458113 0125</b>	<b>218,-</b>

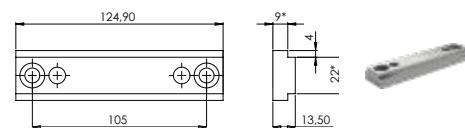
4144



### Top stepped jaws for interchangeable slider

Jaw width mm	art.no.	€
124.9	<b>458112 0125</b>	<b>144,50</b>

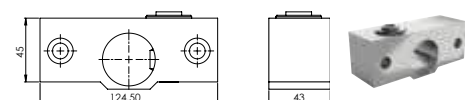
4144



### Angle drive

for type	art.no.	€
MH-S 125	<b>458117 0125</b>	<b>435,-</b>

4144

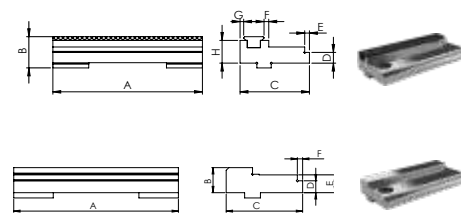


**Top stepped jaws**

• Price per unit

Type	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	art.no.	€
With grip	125	26.1	58	9	4	4	3	19	458111 1125	260,-
Without grip	125	19	58	9	14	4	-	-	458111 0125	189,50

4144

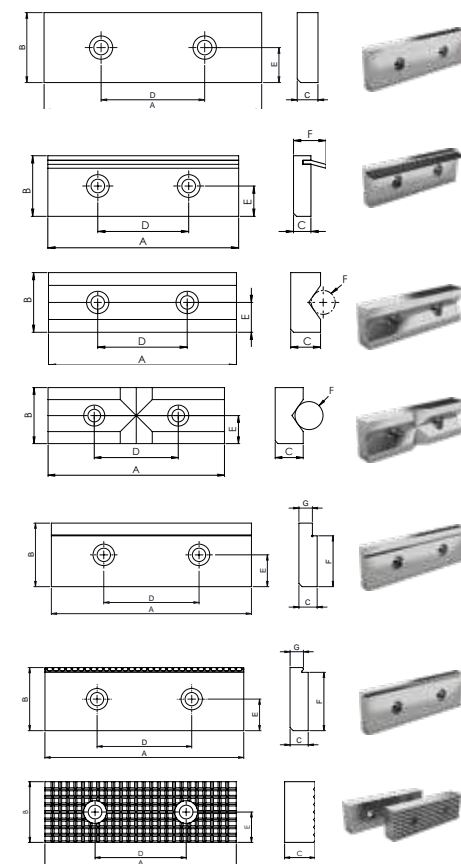


**Screw-in jaws**

• Price per unit

Type	A mm	B mm	C mm	D mm	E mm	F mm	G mm	art.no.	€
With grinding allowance	125	43.4	15.4	80	16	-	-	458110 0125	28,60
Pull-down jaws with spring leaf	125	43	11.5	80	16	21.5	-	458110 6125	90,30
V-block jaws	125	43	20	80	16	8-38	-	458110 3125	97,80
V-block jaws horiz. and vert.	125	43	20	80	16	8-38	-	458110 4125	138,50
Stepped jaws	125	43	11.5	80	16	35	8.5	458110 1125	83,50
Stepped jaws with grip	125	43	11.5	80	16	40	8.5	458110 2125	166,-
Indexable jaws	125	43	15	80	16	-	-	458110 5125	48,70

4144

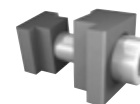


**Clamp set for MH-S 125**

• Price per set = 4 pieces

Designation	art.no.	€
Clamp set for bench groove 14 mm	458118 0014	96,80
Clamp set for bench groove 16 mm	458118 0016	106,-
Clamp set for bench groove 18 mm	458118 0018	98,60
Clamp set for bench groove 20 mm	458118 0020	101,50
Clamp set for bench groove 22 mm	458118 0022	103,-

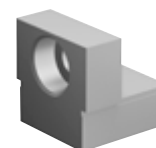
4144



**Positioning slot nut for MH-S 125**

Designation	art.no.	€
Positioning slot nut for bench groove 14	458119 2014	27,30
Positioning slot nut for bench groove 16	458119 2016	41,10
Positioning slot nut for bench groove 18	458119 2018	27,20
Positioning slot nut for bench groove 20	458119 2020	40,70
Positioning slot nut for bench groove 22	458119 2022	40,70

4144

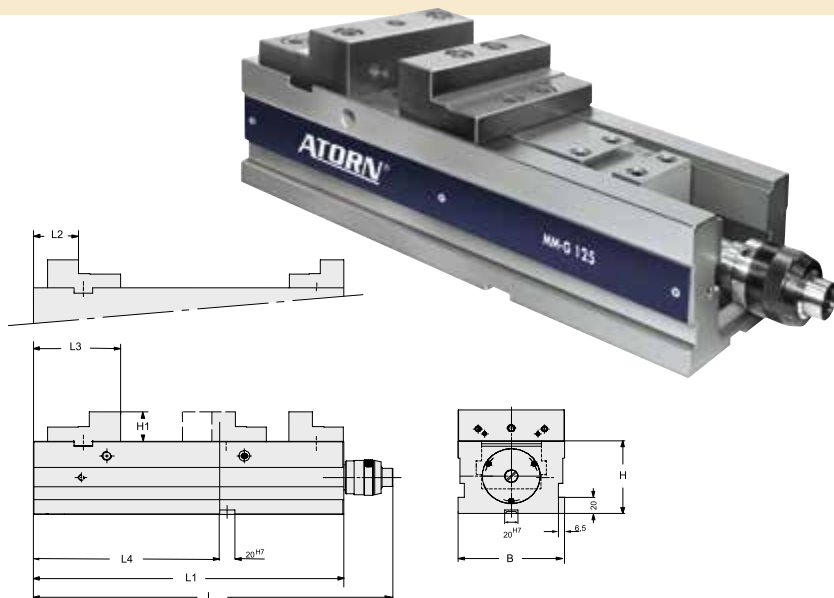


## ATORN® MM-G NC high-pressure machine vice

### Mechanical/mechanical

- Base body made from spheroidal graphite iron
- Base clamping
- Pull-down jaws and other accessories available on request
- Stepped jaws, reversible, hardened and ground
- Long clamping slide assembly including a transverse slot drive spindle with pre-set clamping force
- M12 mounting thread for workpiece stop
- Clamping surfaces for clamping claws
- Rugged chip guard prevents chip ingress into the body

### Incl. clamping fitting bore (pitch 200 mm) for ATORN zero-point clamping system



### Compact clamp

- Incl. stepped jaws and regulator

Jaw width mm	Clamp force kN	L mm	L1 mm	L2 mm	L3 mm	L4 mm	H mm	H1 mm	Clamping range mm	Weight kg	art.no.	€
125	40	463	400	56.5	112.5	240	100	40	0 - 312	41	458800 0125	1.899,-
160	60	618	530	64	130	200	115	50	0 - 451	79	458800 0160	3.389,-

4144

### With pendulum jaws and collar inserts

Type	Jaw width mm	Jaw height mm	art.no.	€
mm -G 125	160	20	458801 0125	2.379,-
mm -G 160	200	25	458801 0160	3.989,-

4144

### Clamping claw

- With screw and T-slot nut
- Price per unit

T-slot size mm	Thread	art.no.	€
12	M10 x 50	458805 1210	35,50
14	M12 x 55	458805 1412	38,10
16	M12 x 60	458805 1612	38,10
18	M16 x 60	458805 1816	42,70
20	M16 x 65	458805 2016	42,70
22	M16 x 65	458805 2216	42,70

4144

### Standard top jaws

- Price per 1-set pack

Width mm	Height mm	art.no.	€
125	40	458810 0125	739,-
160	50	458810 0160	929,-

4144

### Stepped jaws

- Price per 1-set pack

Width mm	Height mm	art.no.	€
125	40	458811 0125	819,-
160	50	458811 0160	999,-

4144

### Base jaw set for grip attachments

- Price per 1-set pack

Width mm	Height mm	art.no.	€
125	20	458814 0125	889,-

4144

### Grip attachments

- Price per unit

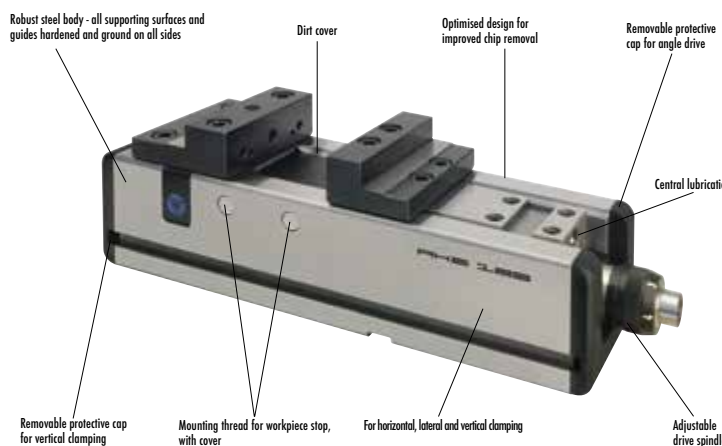
Jaw width mm	Height mm	art.no.	€
92 and 125	28	458815 0125	43,70

4144



## RÖHM RKE NC high-pressure machine vice

- Particularly suitable for use on machining centres
- Horizontal, lateral, or vertical clamping with a base plate, for example as a DUO clamping tower (back to back)
- **Size 92**  
**Mechanical-hydraulic** clamping system with power transmission, manually operated.
- **Size 125, 160**  
**Mechanical-mechanical** clamping system with power transmission, manually operated
- Base body and all guides are hardened and ground on all sides
- Long clamping slide with transverse slots, hardened on all sides, functional surfaces ground
- Drive spindle with pre-set clamping force
- Clamping surface for clamping claws
- Central lubrication fitting for easy guide and spindle thread lubrication
- Stable chip guard prevents chips from entering into the body
- Threaded bores for holding all RÖHM flat clamping jaws with jaw widths of 125 / 160 mm
- Angle drive connecting thread



### NC compact clamp

Jaw width mm	Height mm	Jaw height mm	Total length mm	Clamping range mm	Groove dimensions device mm	Clamp force kN	Weight kg	art.no.	€
92	80	32	346	0-208	20H7	25	15	<b>458200 0092</b>	<b>2.329,-</b>
125	100	40	479	0-312	20H7	40	41	458200 0125	<b>2.669,-</b>
160	115	50	634	0-451	20H7	60	79	458200 0160	<b>4.139,-</b>

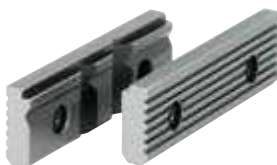
4190

### Universal jaws

- V-block jaw and normal jaw, unhardened and burnished, with workpiece support
- Price per set

Jaw width mm	Height mm	art.no.	€
125	39.6	<b>458822 0125</b>	<b>87,10</b>
160	49.6	458822 0160	<b>115,-</b>

4190



### Standard jaws, cross-grooved

- Price per unit

Jaw width mm	Height mm	art.no.	€
90	31.6	<b>458819 0092</b>	<b>99,-</b>
125	39.6	458819 1125	<b>74,10</b>
160	49.6	458819 0160	<b>104,-</b>

4190



### Claw jaws with 3 x 2.5 steps

- Price per set

Jaw width mm	Height mm	art.no.	€
92	32	<b>458816 0092</b>	<b>405,-</b>
125	40	458816 0125	<b>499,-</b>
160	50	458816 0160	<b>699,-</b>

4190



### V-block jaw

- Price per unit

Jaw width mm	Height mm	art.no.	€
92	31.6	<b>458820 0092</b>	<b>82,80</b>
125	39.6	458820 0125	<b>115,-</b>
160	49.6	458820 0160	<b>145,50</b>

4190



### Claw jaws without steps

- Price per set

Jaw width mm	Height mm	art.no.	€
92	32	<b>458817 0092</b>	<b>332,-</b>
125	40	458817 0125	<b>420,-</b>
160	50	458817 0160	<b>579,-</b>

4190

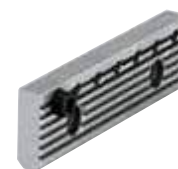


### Standard jaws with adjustable stop

- Price per unit

Jaw width mm	Height mm	art.no.	€
92	31.6	<b>458821 0092</b>	<b>79,90</b>
125	39.6	458821 0125	<b>97,80</b>
160	49.6	458821 0160	<b>142,50</b>

4190



### Standard jaws

- Price per unit

Jaw width mm	Height mm	art.no.	€
92	31.6	<b>458818 0092</b>	<b>47,40</b>
125	39.6	458818 1125	<b>59,20</b>
160	49.6	458818 0160	<b>82,80</b>

4190



### Grip attachments

- Price per unit

Jaw width mm	Height mm	art.no.	€
160	30	<b>458815 1160</b>	<b>46,20</b>

4190



Continued on next page >>>

**Supporting jaw set with pendulum jaws**

- Supplied without grip attachments
- Price per set

for type	Jaw width mm	Height mm	art.no.	€
RKE 92	115	20	<b>458812 0092</b>	539,-
RKE 125	160	20	458812 0125	889,-
RKE 160	200	25	458812 0160	1.429,-

4190

**RÖHM RKZ-M NC compact centric clamp**

- **Steel base frame**
- **All guides are hardened and ground on all sides**
- Mechanical, manually-actuated clamping system without power intensifier
- Central clamping with two mobile jaws
- Optimised for 5-axis machining
- Short, compact design
- Large clamping range
- Middle clamping accuracy:  $\pm 0.02$  mm
- Precision 0.01 mm
- **Supplied with:** 1 pair of hard stepped jaws and crank

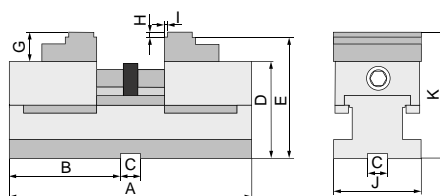
**Base body with staggered top jaws**

Jaw width mm	Total height mm	Height mm	Jaw height mm	Total length mm	Clamping range mm	Groove dimensions device mm	Clamp force kN	Weight kg	art.no.	€
50	75	55	20	167	0 - 111	20 H7	10	3.5	<b>458300 0050</b>	1.269,-
70	95	70	25	219	0 - 153	20 H7	15	7	458300 0070	1.489,-
92	117	85	32	295	0 - 208	20 H7	20	18	458300 0092	2.169,-
125	145	105	40	366	0 - 269	20 H7	25	32.5	458300 0125	2.749,-

4189

**fresmak ARNOLD SC mechanical centring vice**

- Self-centring high-precision clamp
- Repetition precision 0.01mm
- Centring accuracy 0.02mm
- Compact design with external guide
- **Supplied with lever-reversible ratchet and clamping claws**
- **suitable torque wrench art.no. 7026020004**

**Base body with smooth jaws incl. support bars**

A	B	C	D	E	G	H	I	J	K	Weight kg	Clamping range mm	Clamp force kN	Wr. width mm	art.no.	€
250	115	20H7	100	125	30	5	6	90	130	14.3	12 - 245	20	12	<b>458662 0090</b>	1.679,-
350	165	20H7	103	128	30	5	7	125	133	30	14 - 342	40	16	458662 0125	2.099,-

4143

**Claw jaws for hard jaws**

- Price per unit

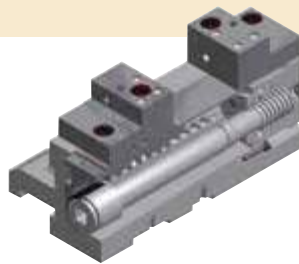
Jaw width mm	Height mm	Depth mm	l4 mm	art.no.	€
90	30	11/14	2.5	<b>458755 0090</b>	233,-
125	30	13/16	2.5	458755 0125	270,-

4143



## ATORN® 5-axis compact clamp

- Body made from ductile iron, GJS 600
- Guideways hardened and ground
- Clamping force 40 kN at 110 Nm
- Patented quick adjustment of the clamping width
- Enclosed spindle
- Secure holding forces due to re-tensioning spring package
- Supplied without crank or torque wrench
- **Suitable torque wrench: article no. 702602 0004 (to be used without sockets)**



### Base body incl. clamping claws

L mm	Width mm	Height mm	Clamp force kN	Weight kg	art.no.	€
250	126	100	40	23	<b>459500 0125</b>	<b>1.589,-</b>
4172						

### Stepped jaws

Jaw width mm	Description	Clamping width mm	art.no.	€
125	Fixed	0 - 178	<b>459501 0001</b>	<b>255,-</b>
125	Movable	0 - 178	459501 0002	<b>239,-</b>
4172				

### Multi-clamping jaws

- Supplied with 2 grip inserts and 2 support elements

Jaw width mm	Description	Clamping width mm	art.no.	€
160	Fixed	10 - 202	<b>459501 0003</b>	<b>370,-</b>
160	Movable	10 - 202	459501 0004	<b>355,-</b>
4172				

### Pendulum jaws

- Supplied with 2x carbide grip inserts

Jaw width mm	Clamping width mm	art.no.	€
156	6 - 168	<b>459501 0005</b>	<b>245,-</b>
4172			

### Screw-on jaws

- Price per PU

Jaw width mm	Description	Clamping width mm	☒	art.no.	€
60	Narrow	7 - 168	2	<b>459501 0006</b>	<b>311,-</b>
125	Wide	77 - 240	2	459501 0007	<b>316,-</b>
4172					

### Grip bars

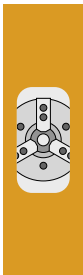
- Price per PU

Jaw width mm	Height mm	Clamping width mm	☒	art.no.	€
125	15	5 - 82	2	<b>459502 0015</b>	<b>155,-</b>
125	35	75 - 172	2	459502 0035	<b>155,-</b>
4172					

### Clip-on support bars

- Price per PU

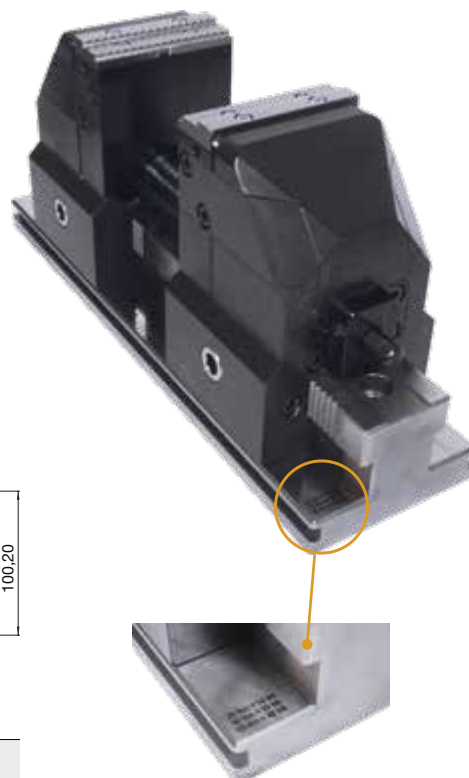
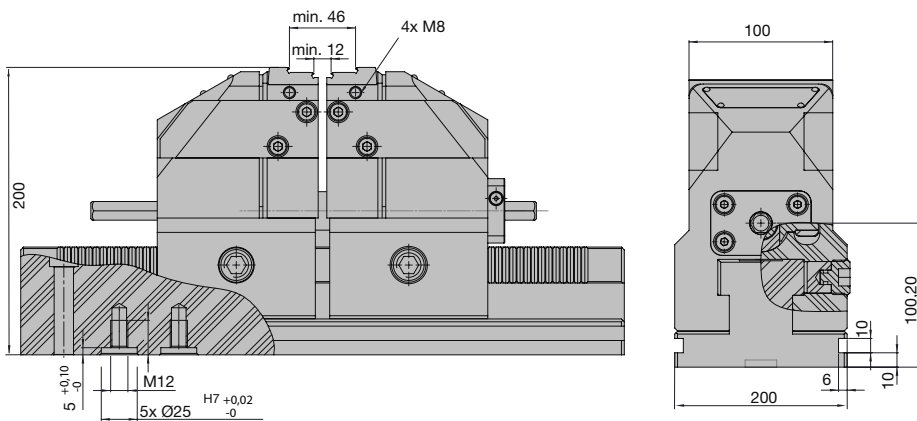
Jaw width mm	Height mm	☒	art.no.	€
125	15	2	<b>459503 0015</b>	<b>126,50</b>
125	35	2	459503 0035	<b>126,50</b>
4172				





# ATORN® 5-axis combination clamp AZS-100

- **Centring vice and fixed jaw clamp in one**
- quick and easy spindle retooling
- mechanical clamping system
- high clamp force with low tightening torque
- very high basic rigidity, allows low-vibration machining
- all guide surfaces hardened and ground
- integrated boreholes for zero-point clamping systems
- Adapter available on request
- Clamp force data and scaling for guidance on basic body
- extensive jaw range
- **Supplied with 1 x grip jaw set 3.5mm, 1 short shaft and 4 clamping jaws**



### Combination clamp AZS-100

Total length mm	Clamping range mm	Weight kg	art.no.	€
420	12 - 256	40	<b>459800 0100</b>	<b>3.659,-</b>
4144				

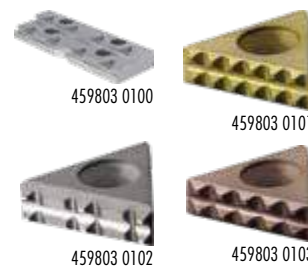
### Top jaws for AZS-100

Description	art.no.	€
Jaw set, smooth 100 mm wide, with 10 mm step - hardened	<b>459801 0103</b>	<b>385,-</b>
Jaw set, smooth 100 mm wide, with 3.5 mm step - hardened	459801 0102	321,-
Jaw set, soft 100 mm wide, aluminium	459801 0105	209,-
Jaw set, soft 100 mm wide, steel	459801 0104	190,50
Grip jaw 100 mm wide, with pendulum and 3.5 mm step	459801 0107	342,-
Grip jaw set 100 mm wide, with 10 mm step	459801 0101	539,-
Grip jaw set 100 mm wide, with 3.5 mm step	459801 0100	475,-
Grip jaw set 70 mm wide, with 3.5 mm step	459801 0106	959,-
4144		



### Grip jaw for carbide inserts

Designation	art.no.	€
Grip jaw set 100 mm wide, for carbide inserts	<b>459803 0100</b>	<b>609,-</b>
AL carbide insert for aluminium (8 pieces)	459803 0101	281,-
NL carbide insert for tempered steels and cast iron (8 pieces)	459803 0102	281,-
HL carbide insert for high-alloy steels (8 pieces)	459803 0103	281,-
4144		



### Workpiece stop

Description	art.no.	€
Mechanical	<b>459804 0100</b>	<b>50,90</b>
4144		





**Alignment pin for AZS-100**

for T-slot mm	art.no.	€
12 mm	459805 0012	176,50
14 mm	459805 0014	176,50
16 mm	459805 0016	176,50
18 mm	459805 0018	176,50
20 mm	459805 0020	176,50

4144



**Clamping claws**

- Price per set (4 units)

Description	art.no.	€
with slit width 17 mm	459806 0017	102,-

4144



**Slot nut and screw for T-slot**

- Price per set (4 units)

for T-slot mm	art.no.	€
12 mm	459807 0012	117,50
14 mm	459807 0014	117,50
16 mm	459807 0016	117,50
18 mm	459807 0018	117,50
20 mm	459807 0020	117,50

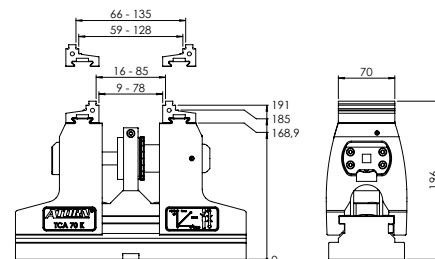
4144



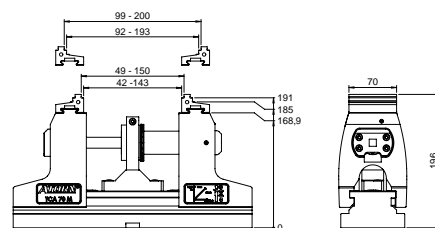
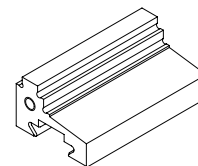
**ATORN® 5-axis clamping system TCA70**

**With central clamp for 5-sided machining.** Thanks to the design and central telescopic spindles, the protruding contours remain unchanged regardless of the clamp width. Excellent accessibility of all sides is guaranteed. The series-standard quick-change jaw system reduces tooling times and increases flexibility.

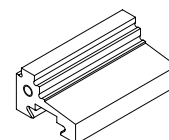
- Ideal for use on 5-axis machining centres
- Conventional clamping and grip clamping possible
- Telescopic spindle, protruding contour remains unchanged
- Central, simple programming without zero offset
- Material allowance is distributed symmetrically
- Repetition precision 0.01 mm
- Centring accuracy 0.02 mm
- Workpiece accessibility irrespective of the clamp width
- Symmetrical design = workpiece remains central and parallel
- Workpiece support height = 192 mm
- Quick-change jaw system, toolfree jaw changing thanks to quick-release lock
- Reversible jaws: for min. / max. clamp width with one pair of jaws
- Constant clamp force thanks to low-maintenance telescopic spindle
- Supplied as standard with locating bores for zero-point clamping system, pitch 200 mm
- Work table attachment also with through-bolts / fitting screws
- In 50 / 63 mm grid or clamping claws
- Integrated scale ring for fine adjustment of the central position
- Clamp force 30 kN at 45 Nm linear
- Operation with torque wrenches
- **Supplied with**
  - 1 ATORN TCA70 without jaws
  - 1 support plate for transportation
  - 1 hand crank for pre-setting



459700 0070



459700 1070



L mm	Clamp force kN	Weight kg	art.no.	€
286	30	17.5	459700 0070	3.099,-
351	30	19.5	459700 1070	3.289,-

4172

## ATORN® Accessories for 5-axis clamping system TCA70

### Clamp width adapter

- Suitable for TCA70-M
- Clamp width reduction from 9 mm
- Made from case-hardened steel (burnished)

NEW

Clamping range	art.no.	€
9 - 165 mm	459715 0070	239,-
	4172	



### Stepped jaws, carbide-coated

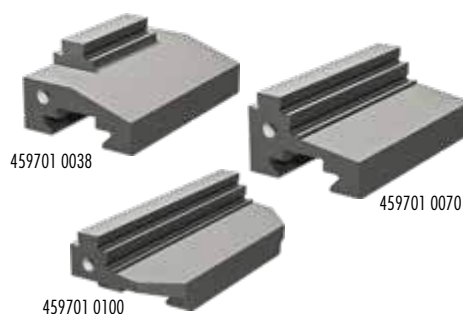
- For clamping workpieces to be machined in parallel
- Clamping surfaces (step) with additional carbide coating to guarantee secure clamping
- Price per unit

#### Clamp width

Type 70K 9-135 mm

Type 70M 42-200 mm

Jaw width mm	Weight kg	art.no.	€
38	0.3	459701 0038	296,-
70	0.3	459701 0070	312,-
100	0.4	459701 0100	342,-
		4172	



### Grip jaws

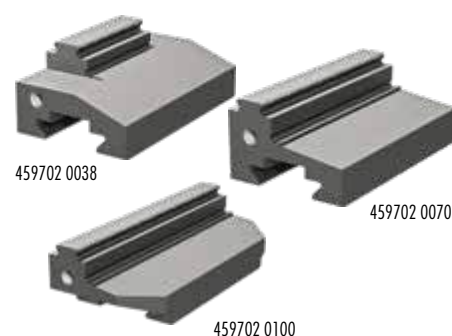
- Minimal lost clamping edge of 4 mm
- Positive form fitting through the penetration of the pointed tips into the material without pre-shaping
- Integrated grip row, thus rigid vibration-resistant construction particularly in upright parts
- Additional clamping surfaces, ground on both sides
- Suitable for material strength up to 1000 N/mm<sup>2</sup>
- Price per unit

#### Clamp width

Type 70K 9-134 mm

Type 70M 42-199 mm

Jaw width mm	Weight kg	art.no.	€
38	0.3	459702 0038	245,-
70	0.3	459702 0070	234,-
100	0.4	459702 0100	348,-
		4172	



### V-block jaws

- For the horizontal and vertical clamping of round and flat workpieces
- Price per unit

#### Clamp width

Type 70K horizontal Ø 10 mm - Ø 40 mm; vertical Ø 16 mm - Ø 80 mm

Type 70M horizontal Ø 10 mm - Ø 40 mm; vertical Ø 47 mm - Ø 110 mm

Jaw width mm	Weight kg	art.no.	€
70	0.6	459703 0070	375,-
		4172	



### Zero jaw

- Clamping of parallel, pre-machined workpieces
- Clamp width 0 - 69 mm
- Cylindrical pins as support surface; setting at heights of 176 mm and 191 mm possible
- Minimal clamping edge: 20 mm for height 176 mm, 5 mm for height 191 mm
- Material: case-hardened steel
- Includes 4 cylindrical pins 4x10 DIN EN ISO 8734
- Price per unit

Jaw width mm	Weight kg	art.no.	€
70	0.6	459705 0070	355,-
		4172	



**Grip insert for supporting jaw**

- for clamping raw parts
- also firmly holds soft materials with lower clamp force
- linear impression in the material ensures less deformation in soft materials
- lost clamping edge: adjustable from 3.7 to 5.2mm
- Grip height: adjustable from 2.6 to 4.1 mm
- for tools with ≤ 0.2mm / 100mm parallelism
- grip inserts suitable for materials up to approx. 1000N/mm<sup>2</sup> strength

Ø mm	Height mm	art.no.	€
16	8	<b>459716 0001</b>	<b>48,90</b>

4172

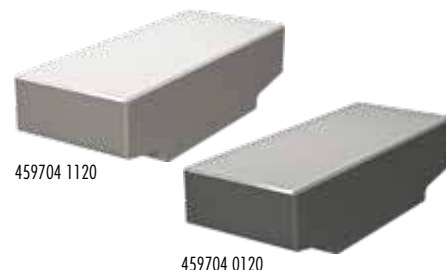


**Soft jaws**

- Material: case-hardened steel or aluminium
- For self-assembly of special jaws
- Maximum machining depth: 1.5 mm
- Price per unit
- **Clamp width**  
**Type 70K** 0 mm - 70 mm  
**Type 70M** 34 mm - 135 mm

Jaw width mm	Design	Weight kg	art.no.	€
120	Steel 21MnCr5G - 1.2162	1.2	<b>459704 0120</b>	<b>181,50</b>
120	Aluminium AlZn5.5MgCu	0.4	459704 1120	176,-

4172



**Clamping claws**

- For attaching the clamp to the work table
- Price per set = 2 pieces

for thread	art.no.	€
M12 to M16	<b>459711 0001</b>	<b>42,80</b>

4172



**Alignment and fastening set for T-slot**

- For attachment to pallet and work table with clamping claws

for T-slot mm	Thread	art.no.	€
12	M10	<b>459710 1210</b>	<b>181,50</b>
14	M12	459710 1412	124,50
16	M14	459710 1614	178,-
18	M16	459710 1816	131,50
22	M16	459710 2216	242,-

4172



**Supporting jaw for grip inserts**

- Clamping of raw parts, misshapen and round workpieces
- Suitable for mounting various grip inserts (pointed/smooth)
- Material: case-hardened steel
- Price per unit

Jaw width mm	Weight kg	art.no.	€
120	0.5	<b>459706 0120</b>	<b>272,-</b>

4172



**Alignment and fastening set for bottom section**

- For alignment (positioning) and attachment of the clamp lower section to pallet and work table
- Price per set = 2 pieces

for T-slot mm	Thread	art.no.	€
14	M12	<b>459720 1412</b>	<b>93,60</b>
16	M12	459720 1612	133,50
18	M12	459720 1812	92,60

4172



**Workpiece stop**

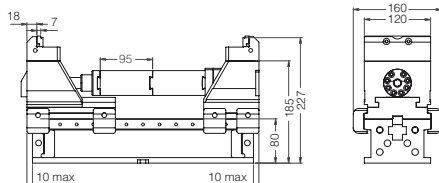
Design	art.no.	€
magnetic	<b>459713 0002</b>	<b>51,90</b>
mechanical	459713 0001	51,90

4172



## ATORN® 5-axis slide rail set 120 mm

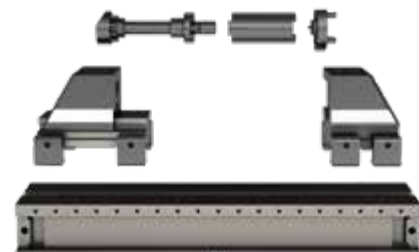
- For stable, low-vibration machining
- 40 kN clamp force at 85 Nm tightening torque
- Positive-fit jaw mounting
- Coated spindle and spindle nut
- Spindle can be extended without tools
- Extendable to all required lengths
- Retooling in seconds
- Extensive range of accessories and jaws



### Slide rail set 120 mm, without jaws

L mm	Width mm	Clamping width mm	Extensions mm	art.no.	€
300	120	0 - 270	1	464100 1230	2.029,-
400	120	0 - 370	2	464100 1240	2.149,-
500	120	0 - 470	3	464100 1250	2.449,-
600	120	0 - 570	4	464100 1260	2.859,-

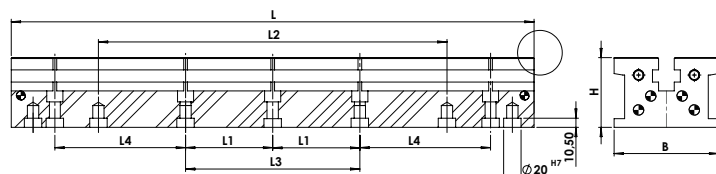
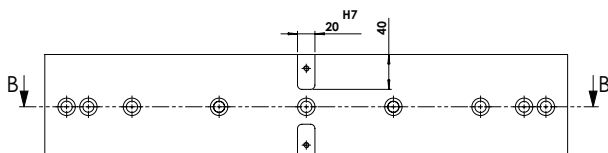
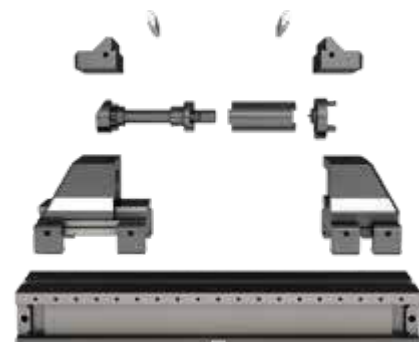
4197



### Slide rail set 120 mm, with jaws

L mm	Width mm	Clamping width mm	Extensions mm	art.no.	€
300	120	0 - 270	1	464101 1230	2.629,-
400	120	0 - 370	2	464101 1240	2.739,-
500	120	0 - 470	3	464101 1250	3.039,-
600	120	0 - 570	4	464101 1260	3.449,-

4197



### Slide rail 120 mm wide 80 mm high without body

L mm	Width mm	Height mm	L1 mm	L2 mm	L3 mm	L4 mm	for screws	art.no.	€
200	120	80	-	-	100	-	M16 - DIN912	464102 1220	699,-
300	120	80	100	-	-	-	M16 - DIN912	464102 1230	789,-
400	120	80	150	-	-	-	M16 - DIN912	464102 1240	909,-
500	120	80	200	-	-	-	M16 - DIN912	464102 1250	1.209,-
600	120	80	-	400	250	400	M16 - DIN912	464102 1260	1.479,-

4197



### Accessories for 5-axis body

Designation	art.no.	€
5-axis body for slide rails, complete	464103 1201	1.329,-
Fixed base block	464103 1202	450,-
Base block clamping unit (moving jaws)	464103 1203	609,-
Spindle, complete	464103 1204	270,-
Spindle extension	464103 1205	78,90

4197



464103 1201



464103 1202



464103 1203



464103 1204



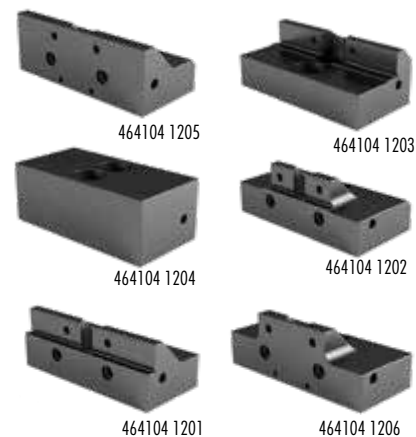
464103 1205

**Clamping jaws for 5-axis body**

• Price per unit

Designation	art.no.	€
Standard jaws 120 mm wide for clamping width 120 mm	<b>464104</b> 1201	<b>214,-</b>
Standard jaws 120 mm wide for clamping width 60 mm	464104 1202	<b>229,-</b>
Jaws 120 mm wide for clamping large workpieces	464104 1203	<b>280,-</b>
Standard jaws (soft) 120 mm wide for clamping width 120 mm	464104 1204	<b>152,-</b>
Smooth jaws, clamping width 120 mm for parallel supports, Article No. 464107 12..	464104 1205	<b>198,50</b>
Smooth jaws, clamping width 60 mm for parallel supports, Article No. 464107 06..	464104 1206	<b>219,-</b>

4197

**Parallel supports, ground**

• Price per unit

L mm	Width mm	Height mm	art.no.	€
60	8	12	<b>464107</b> 0612	<b>48,-</b>
60	8	17	464107 0617	<b>48,-</b>
60	8	25	464107 0625	<b>48,-</b>
60	8	30	464107 0630	<b>48,-</b>
60	8	35	464107 0635	<b>48,-</b>
60	8	44	464107 0644	<b>42,10</b>
120	8	12	464107 1212	<b>50,60</b>
120	8	17	464107 1217	<b>50,60</b>
120	8	25	464107 1225	<b>50,60</b>
120	8	30	464107 1230	<b>50,60</b>
120	8	35	464107 1235	<b>50,60</b>
120	8	44	464107 1244	<b>44,80</b>

4197

**Pendulum jaws with accessories for 5-axis body**

• Price per unit

Designation	L mm	Width mm	Height mm	Ø mm	art.no.	€
Base jaws set with rotary plate for Flex clamping jaws	150	90	30	-	<b>464105</b> 1501	<b>909,-</b>
Flex clamping jaw, smooth	-	-	-	18	464105 1502	<b>36,90</b>
Flex clamping jaw with claws	-	-	-	18	464105 1503	<b>47,80</b>
Flex clamping jaw with carbide gripper	-	-	-	18	464105 1504	<b>53,40</b>
Standard swivel jaws with rotary table	120	68	44.4	-	464105 1202	<b>385,-</b>
Swivel jaws with rotary plate for large workpieces	120	68	44.4	-	464105 1201	<b>385,-</b>

4197

**Screw-in jaws for clamping jaws**

• Price per unit

Designation	art.no.	€
Soft screw-in jaws 120 mm	<b>464106</b> 0001	<b>48,90</b>
Soft screw-in jaws 60 mm	464106 0002	<b>45,-</b>
Screw-in jaws with claw and steps 3 mm and 5 mm 120 x 19 x 11	464106 0003	<b>114,-</b>
Screw-in jaws with claw and steps 3 mm and 5 mm 60 x 19 x 11	464106 0004	<b>109,-</b>
Screw-in jaws with steps 3 mm and 5 mm 120 x 19 x 11	464106 0005	<b>98,70</b>
Screw-in jaws with steps 3 mm and 5 mm 60 x 19 x 11	464106 0006	<b>94,60</b>
Combi screw-in jaws 120 mm (step 1 smooth with claws, step 2 smooth)	464106 0007	<b>115,-</b>
Combi screw-in jaws 60 mm (step 1 smooth with claws, step 2 smooth)	464106 0008	<b>107,-</b>

4197

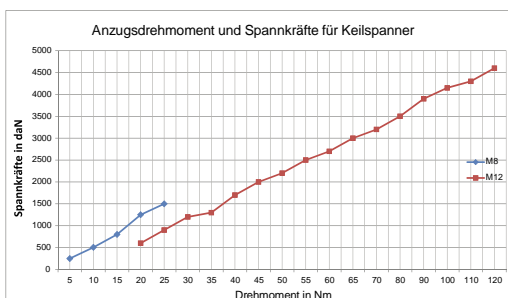


## ATORN® Modular multi-clamping fixture

- Quick and precise workpiece clamping on vertical and horizontal machining centres, milling and grinding machines
- Standard clamping device for different workpieces
- Wedge clamps of various sizes can be used
- Allows different workpieces to be clamped in extremely confined spaces
- Multiple slide rails combined by means of a connection system, optimum length adjustment to the work table
- **Tombstones available on request**
- **60° toothing**

### Particular benefits:

- Perform numerous clamping tasks with one clamping system
- Can also be used on ATORN zero-point clamping systems
- All system components are compatible
- Easy-to-install stop system
- Cost-effective clamping system



### Multi-clamping slide rail sets

- Rail-mounted clamping elements
- Other combinations available on request

Contents per set	Dimensions	art.no.	€
1x slide rail, 2x smooth fixed jaws 1x smooth wedge clamp	200 x 50 x 80	<b>464001</b> 2050	<b>849,-</b>
1x slide rail 2x smooth fixed jaws 1x smooth wedge clamp	200 x 80 x 80	464001 2080	979,-
1x slide rail 3x smooth fixed jaws 2x smooth wedge clamps	300 x 50 x 80	464001 3050	1.099,-
1x slide rail 3x smooth fixed jaws 2x smooth wedge clamps	300 x 80 x 80	464001 3080	1.359,-
1x slide rail 3x smooth fixed jaws 2x smooth wedge clamps	400 x 50 x 80	464001 4050	1.169,-
1x slide rail 3x smooth fixed jaws 2x smooth wedge clamps	400 x 80 x 80	464001 4080	1.419,-
1x slide rail 3x smooth fixed jaws 2x smooth wedge clamps	500 x 50 x 80	464001 5050	1.399,-
1x slide rail 3x smooth fixed jaws 2x smooth wedge clamps	500 x 80 x 80	464001 5080	1.649,-

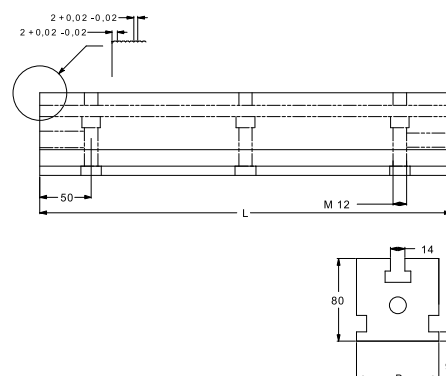
4195



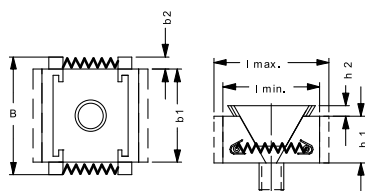
### Multi-clamping slide rails, individual

L mm	B mm	H mm	Number of holes	art.no.	€
200	50	80	2	<b>464002</b> 2050	<b>649,-</b>
200	80	80	2	464002 2080	709,-
300	50	80	3	464002 3050	709,-
300	80	80	3	464002 3080	789,-
400	50	80	3	464002 4050	789,-
400	80	80	3	464002 4080	889,-
500	50	80	3	464002 5050	1.049,-
500	80	80	3	464002 5080	1.109,-

4172







**Wedge clamp**

- Includes slot nut and screw
- 464008.... with M8 thread = 3 mm allowance per side
- 464008.... with M12 thread = 5 mm allowance per side
- Articles 464008.... and 464009.... include thread in the clamping surface

B mm	l min. mm	l max. mm	h1 mm	h2 mm	b1 mm	b2 mm	Screw	Clamp force kN	smooth		grooved		With allowance		With claws	
									art.no.	€	art.no.	€	art.no.	€	art.no.	€
30	27.5	33	15	5	22	4	M8	15	<b>464006</b> 3015	<b>93,60</b>	<b>464007</b> 3015	<b>99,70</b>	<b>464008</b> 3015	<b>99,70</b>	<b>464009</b> 3015	<b>120,50</b>
40	27.5	33	15	5	32	4	M8	15	464006 4015	110,-	464007 4015	114,-	464008 4015	114,-	464009 4015	136,50
50	27.5	33	15	5	42	4	M8	15	464006 5015	130,50	464007 5015	136,50	464008 5015	136,50	464009 5015	154,-
40	28	46.5	22	7	30	5	M12	45	464006 4022	140,50	464007 4022	148,50	464008 4022	148,50	464009 4022	168,-
50	38	46.5	22	7	40	5	M12	45	464006 5022	152,-	464007 5022	162,-	464008 5022	162,-	464009 5022	178,-
60	38	46.5	22	7	50	5	M12	45	464006 6022	176,-	464007 6022	178,-	464008 6022	178,-	464009 6022	204,-
54	46.5	59.5	29	11	42	6	M12	45	464006 5429	178,-	464007 5429	192,50	464008 5429	192,50	464009 5429	216,-
69	46.5	59.5	29	11	57	6	M12	45	464006 6929	201,-	464007 6929	207,-	464008 6929	207,-	464009 6929	236,-
84	46.5	59.5	29	11	72	6	M12	45	464006 8429	258,-	464007 8429	268,-	464008 8429	266,-	464009 8429	284,-
									4172		4172		4172		4172	



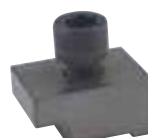
464010 0001



464010 0002



464010 0003



464010 0004



464010 0006

**Accessories**

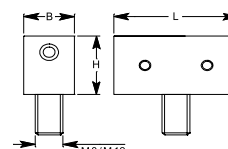
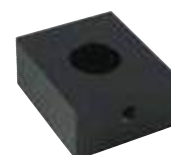
- Price per pack

Description	art.no.	€
Adapter set	<b>464010</b> 0001	<b>76,30</b>
2 x adjustable limit stop	464010 0002	51,40
Fixed limit stop	464010 0003	24,30
Clamping claw set / 4 pieces	464010 0004	84,-
Positioning socket 20 x 14 mm	464010 0005	27,-
Positioning bush 20 x 18 mm	464010 0006	27,-
4172		

**Fixed jaws**

- Includes slot nut and screw

L mm	B mm	H mm	Screw	smooth		grooved		With claws	
				art.no.	€	art.no.	€	art.no.	€
22	22	15	M8	<b>464003</b> 2215	<b>48,90</b>	<b>464004</b> 2215	<b>74,80</b>	<b>464005</b> 2215	<b>70,70</b>
32	22	15	M8	464003 3215	50,40	464004 3215	75,80	464005 3022	124,50
42	22	15	M8	464003 4215	52,90	464004 4215	76,80	464005 3215	71,20
30	42	22	M12	464003 3022	102,-	464004 3022	137,-	464005 4022	126,50
40	42	22	M12	464003 4022	103,-	464004 4022	139,-	464005 4215	72,80
42	42	22	M12	464003 4229	114,-	464004 4229	152,-	464005 4229	141,-
50	42	29	M12	464003 5022	103,50	464004 5022	139,-	464005 5022	131,-
57	42	29	M12	464003 5729	118,-	464004 5729	155,-	464005 5729	145,-
72	42	29	M12	464003 7229	121,-	464004 7229	162,-	464005 7229	147,-
				4172		4172		4172	





## ATORN® Modular multi-clamping fixture 120 mm

- Extremely high basic rigidity
- Clamp force 40 kN
- Compatible with 50 mm and 80 mm slide rails
- All standard wedge clamps and jaws suitable
- Extendable to all required lengths

### With smooth clamping surface

- Supplied with: 1x slide rail, 1x fixed jaw, 1x wedge clamp with fixed jaws

L mm	Width mm	Height mm	art.no.	€
200	120	80	<b>464108</b> 1220	1.139,-
300	120	80	464108 1230	1.229,-
400	120	80	464108 1240	1.359,-
500	120	80	464108 1250	1.669,-
600	120	80	464108 1260	1.939,-

4197



### With 3 mm step and claw

- Supplied with: 1x slide rail, 1x fixed jaw, 1x wedge clamp with fixed jaws

L mm	Width mm	Height mm	art.no.	€
200	120	80	<b>464109</b> 1220	1.249,-
300	120	80	464109 1230	1.349,-
400	120	80	464109 1240	1.449,-
500	120	80	464109 1250	1.769,-
600	120	80	464109 1260	2.029,-

4197

### Grooved design

- Supplied with: 1x slide rail, 1x fixed jaw, 1x wedge clamp with fixed jaws

L mm	Width mm	Height mm	art.no.	€
200	120	80	<b>464110</b> 1220	1.229,-
300	120	80	464110 1230	1.339,-
400	120	80	464110 1240	1.449,-
500	120	80	464110 1250	1.749,-
600	120	80	464110 1260	2.029,-

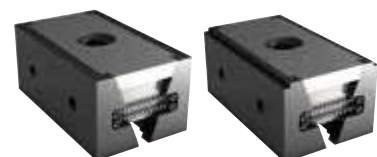
4197

### Wedge clamp 120 mm

- For use with 50 mm and 80 mm slide rails, a slot nut art.no. 4640100009, a screw bushing art.no. 4640100012 and a screw M12 must be used

Type	Jaw width mm	Height mm	H1 mm	l min. mm	l max. mm	Screw	Clamp force kN	art.no.	€
Smooth	120	8	11	59.5	46.5	M16 - DIN912	40	<b>464111</b> 1201	306,-
3 mm step and claw	120	6	11	59.5	46.5	M16 - DIN912	40	464111 1202	355,-
Smooth with carbide gripper	120	8	11	59.5	46.5	M16 - DIN912	40	464111 1203	390,-
Squared	120	8	11	59.5	46.5	M16 - DIN912	40	464111 1204	346,-

4197



464111 1201

464111 1202



464111 1203

464111 1204

### Wedge clamp with fixed jaw 120 mm

- For use with 50 mm and 80 mm slide rails, 2x slot nut art.no. 4640100009, 2x screw bushing art.no. 4640100012 and 2x screw M12 must be used

Type	Jaw width mm	Height mm	H1 mm	l min. mm	l max. mm	Screw	Clamp force kN	art.no.	€
Smooth	120	11	8	85	97	M16 - DIN912	40	<b>464112</b> 1201	306,-
With 3 mm step and claw	120	11	6	85	97	M16 - DIN912	40	464112 1202	355,-
With carbide gripper	120	11	8	85	97	M16 - DIN912	40	464112 1203	390,-
Squared	120	11	8	85	97	M16 - DIN912	40	464112 1204	346,-

4197



464112 1204

464112 1202



464112 1203

464112 1201

**Fixed jaw 120 mm**

- For use with 50 mm and 80 mm slide rails, 2x slot nut art.no. 4640100009, 2x screw bushing art.no. 4640100012 and 2x screw M12 must be used

Type	Jaw width mm	Height mm	L mm	Screw	art.no.	€
Smooth	120	54	72	M16 - DIN912	<b>464113 1201</b>	172,-
With 3 mm step and claw	120	54	72	M16 - DIN912	464113 1202	190,50
With carbide gripper	120	54	72	M16 - DIN912	464113 1203	201,-
Squared	120	54	72	M16 - DIN912	464113 1204	194,50
4197						



**Accessories for clamping rail 120 mm**

Designation	art.no.	€
Clamping claw set 40 mm for screws M16 (1 PK = 4 pcs.)	<b>464010 0007</b>	72,80
Slot nut, short M8	464010 0008	6,30
Slot nut, short M12	464010 0009	6,30
Slot nut, long M8	464010 0010	6,65
Slot nut, long M12	464010 0011	6,65
Screw bushing reduction from M16 to M12	464010 0012	10,35
Adapter set for slide rails extension	464010 0013	153,-
4197		



**SARA® Modular multi-clamping fixture**

- Mechanical clamping fixture with a modular design
- Accuracy: within 0.02 mm
- Base body made from hardened steel, 60 HRC
- Fully equipped for clamping four workpieces; can be optionally extended to a maximum of 9 clamping positions (see table below)
- Clamping jaws are 1 mm narrower than the base body, allowing lateral use of the clamp
- Also available with stepped jaws on request; prismatic jaws available as accessories
- **Supplied with** four tool stops, clamping claws, slot nuts, alignment blocks, lifting screws and a chuck key, one fixed jaw and four intermediate jaws



**Slide rail, width 50 mm**

A mm	B mm	C mm	art.no.	€
300	50	50	<b>460250 0300</b>	1.039,-
400	50	50	460250 0400	1.119,-
500	50	50	460250 0500	1.229,-
600	50	50	460250 0600	1.349,-
4148				

**Slide rail, width 75 mm**

A mm	B mm	C mm	art.no.	€
400	75	75	<b>460275 0400</b>	1.359,-
500	75	75	460275 0500	1.459,-
700	75	75	460275 0700	1.679,-
4148				

Continued on next page >>>

**Movable jaw - grooved**

Width mm	L mm	Height mm	art.no.	€
49	54/58	25	<b>460282 0050</b>	<b>133,50</b>
74	70/75	40	460282 0075	156,-

4148

**Fixed jaw**

Width mm	L mm	Height mm	art.no.	€
49	38	25	<b>460281 0050</b>	<b>78,90</b>
74	50	40	460281 0075	92,60

4148

**Movable jaw - smooth**

Width mm	L mm	Height mm	art.no.	€
49	54/58	25	<b>460280 0050</b>	<b>131,50</b>
74	70/75	40	460280 0075	149,50

4148



**ATORN® 3-place clamping pyramid**

**NEW**

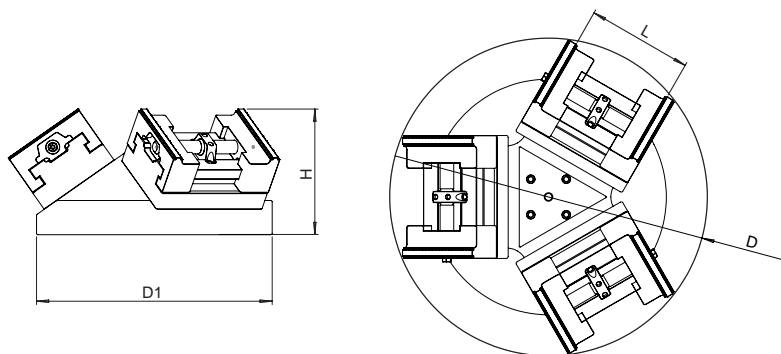
- Includes centric clamping vice RS-Z
- Optionally with ATORN installation clamping module K20
- Prepared for zero-point clamping systems ATORN K20, AMF K20, Lang-Quick-Point 52 and Quick-Point 96, further adaptations available on request
- Space-saving and compact, very good accessibility for 5-axis machining
- Fewer tool changes thanks to multiple set-ups
- High efficiency due to shorter running times per workpiece (fewer tool changes)
- Shorter running times through optimisation of cycle times
- Reliable machining with maximum stability thanks to proven RS-Z centric clamping vices
- Improved automation utilisation with high profitability



User video

Example:  
Matsura MAM 72-35V with 40-fold pallet storage: original utilisation = 40 workpieces.  
The RS20.3P-310 enables unmanned clamping and processing of 120 workpieces.

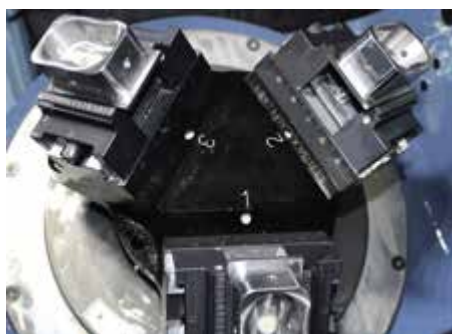
- Supplied ex works, excluding packaging



**includes 3-pcs. centric clamping vices RS-Z**

Jaw width mm	Clamping range mm	D mm	D1 mm	H mm	L mm	Weight kg	art.no.	€
75	8 - 100	310	305	146	104	15	<b>469200 0310</b>	<b>2.999,-</b>
125	8 - 150	465	345	184	154	54	469200 0465	4.019,-

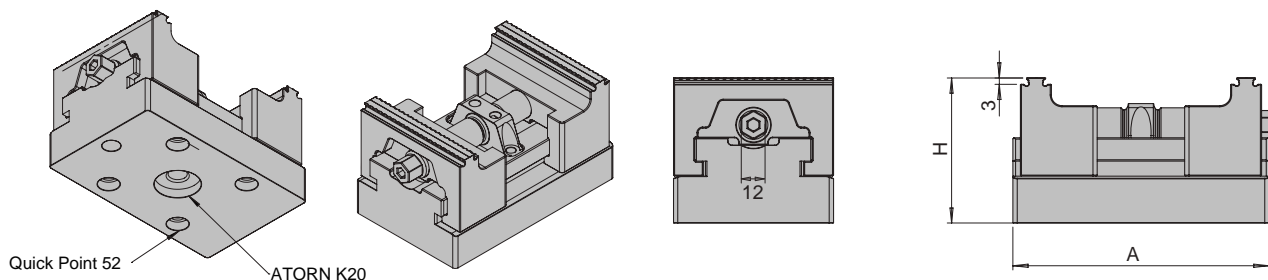
4185



## ATORN® Centric clamping vice RS-Z

NEW

- with patented pull-down system, for use with RS embossing station
- clamping jaws also suitable for embossing systems
- firm clamping for high cutting output
- prepared for ATORN ZPS K20 and Lang Quick Point 52
- other adaptations for your machine tables available on request
- RS embossing station and RS embossing jaws for Lang embossing station available on request



### Jaw width 75mm

Jaw width mm	Clamping range mm	A mm	H mm	art.no.	€
75	8 - 100	125	68	459110 0125	509,-
75	8 - 125	150	68	459110 0150	519,-
75	8 - 150	175	68	459110 0175	579,-
75	8 - 175	200	68	459110 0200	629,-

4185

### Jaw width 125 mm

Jaw width mm	Clamping range mm	A mm	H mm	art.no.	€
125	8 - 150	180	92	459111 0180	679,-
125	8 - 200	230	92	459111 0230	709,-
125	8 - 250	280	92	459111 0280	849,-
125	8 - 300	330	92	459111 0330	1.019,-

4185



## ATORN® Accessories for RS-Z and 3-place clamping pyramid

NEW

### Combination jaws set with grip / smooth

Jaw width mm	art.no.	€
75	459114 2075	310,-
125	459114 2125	509,-

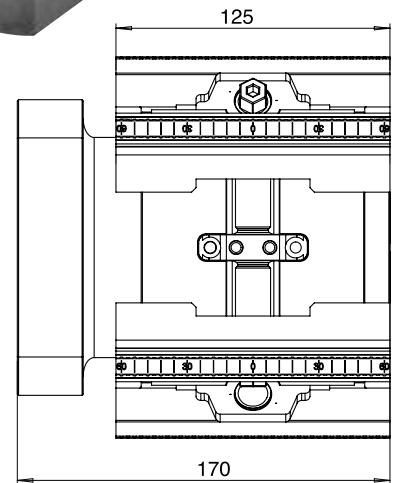
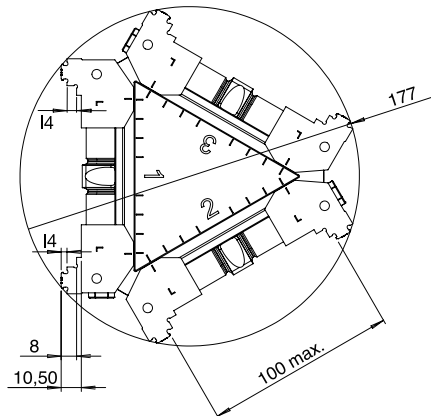
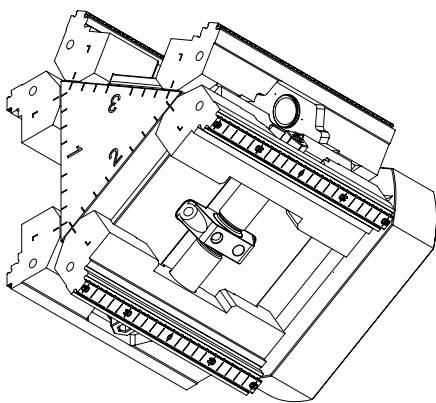
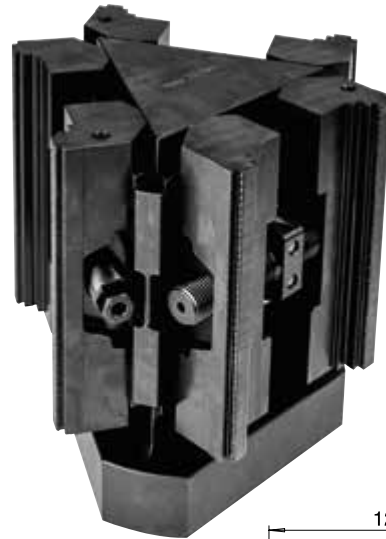
4185





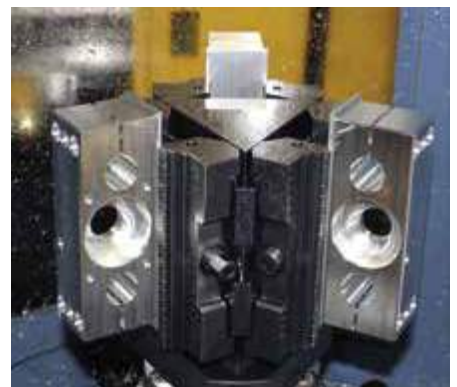
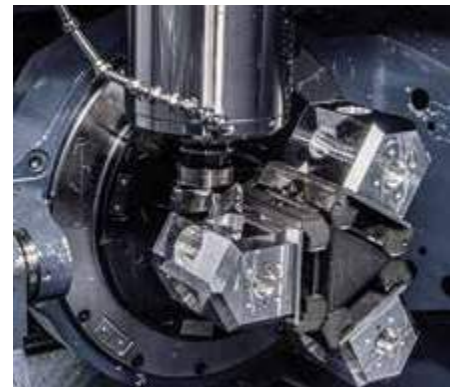
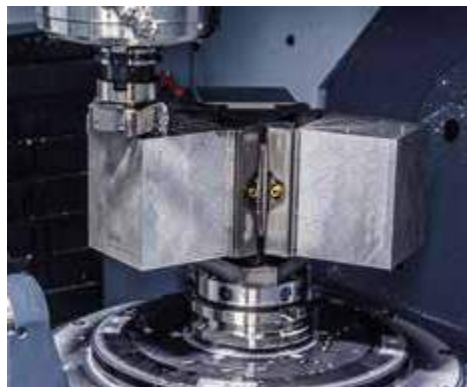
# ATORN® 3-way clamping tower RS-T

- ultra-efficient, compact and space-saving
- high productivity thanks to considerably higher machine productivity during unmanned shifts
- fewer tool changes thanks to multiple set-ups
- max. parts size 100 x 100mm x variable length with a displacement circle of 350mm
- high efficiency
- prepared for ATORN ZPS K20 and Lang Quick Point 52
- **clamping jaws also suitable for embossing systems**
- **other adaptations for your machine tables available on request**



for ATORN ZPS K20 and Lang Quick Point 52

Jaw width mm	14 mm	Clamping range mm	Total height mm	art.no.	€
125	3 + 5	8 - 100	170	<b>469100 0125</b>	<b>3.049,-</b>
				4185	



# Clamping with a vacuum

Innovative ATORN vacuum clamping technology



## When the focus lies on tooling time and safety

Vacuum clamping technology is particularly suitable for minimized setup time and process-safe clamping of flat workpieces with level undersides that are to be clamped and machined non-destructively.

For this we offer innovative and sophisticated solutions with many accessories – for optimum and individual clamping. When it comes to precision and you want to handle workpieces made of aluminium, non-ferrous metals, graphite, plastics, glass, wood, ceramic, titanium and steel, the ATORN clamping plate sets lay down an excellent foundation for the work. These sets allow firm and precise clamping of your workpieces, delivering in turn good results from milling or drilling.

Vacuum systems hold the workpiece fast through suction and provide an excellent grip. Using a Venturi tube or a vacuum pump has proven very useful here.

## Why you will achieve more with the ATORN vacuum clamping technology

One set, two options. This is what makes the new ATORN vacuum clamping system stand out.

The new low-cost entry into the vacuum clamping technology for short-term wins out through its use of the Venturi principle. The vacuum is created through a direct connection to the compressed air supply without a vacuum pump unit. For energy-saving continuous use in series production, a vacuum pump unit is advisable.

You can clamp indirectly by means of sandwich adapter mats or directly on a grid plate. The use of adapter plates or rubber adapter mats offers two important advantages:

- Producing break-outs in the workpiece machining
- Marked reduction of the clamping times, since, in comparison with fastening directly to the grid plate, no packing cords are needed

Variants:

- ATORN slot plate for clamping micro-components and workpieces with the most widely varied contours
- ATORN grid plates for clamping simple workpieces for heavy machining
- ATORN adapter mats for workpieces with and without break-outs





## ATORN® Vacuum clamping technology

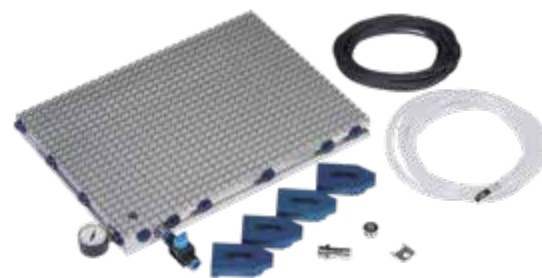
### Grid vacuum plate sets with Venturi nozzles

- Can be extended with conventional vacuum pumps, making it suitable for wet machining

- For workpieces with simple geometric shapes
- Good seal: also suitable for rough (e.g. sawn) surfaces
- High holding forces
- Minor irregularities and concavities are sealed and compensated by flexible sealing cords

#### • Each set comprises:

- 1x vacuum grid plate with 12.5 mm pattern, incl. integrated Venturi nozzle
- Height-adjustable stop discs
- 4x clamping claws with slot width = 14 mm
- 3 m plastic hose with hose connection and quick-action coupling
- 10 m vacuum sealing cord, Ø 4 mm black
- Incl. silencer and shut-off valve
- 1x hose connection for conventional vacuum pumps



Type	Dimensions L x W x H mm	art.no.	€
RV1	300x200x32.5	<b>475081</b> 3020	1.119,-
RV2	400x300x32.5	475081 4030	1.909,-
RV3	600x400x32.5	475081 6040	2.389,-

4182

### Slotted vacuum plates

- For clamping workpieces on adapter mats and rubber holding mats
- For machining complicated workpiece shapes
- Very small workpieces can be clamped
- Workpiece positioning by height-adjustable eccentric stops
- **Supplied with** vacuum hose connector piece, connection element, assembly tool, aluminium clamping claws, rubber adapter mat (brown), 1 m vacuum hose with wire helix and quick-coupling plug

Type	Dimensions L x W x H mm	art.no.	€
MS1	300x200x48	<b>475089</b> 2030	1.279,-
MS2	400x300x48	475089 3040	1.609,-
MS3	600x400x48	475089 4060	2.749,-

4182

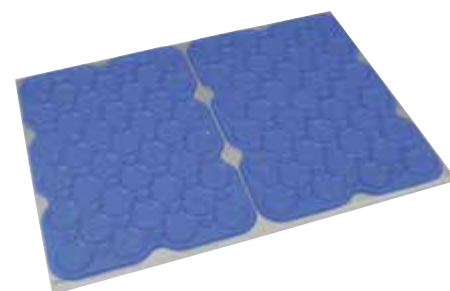


### Adapter plates for slotted vacuum plates

- For adapter mats with Article No. 475085....
- **Supplied with** 10x adapter mat (blue), 2 m sealing cord

Designation	Dimensions L x W x H mm	art.no.	€
for MS1	300x200x10	<b>475090</b> 2030	336,-
for MS2	400x300x10	475090 3040	519,-
for MS3	600x400x10	475090 4060	699,-

4182



### Vacuum clamping system with adapter mats

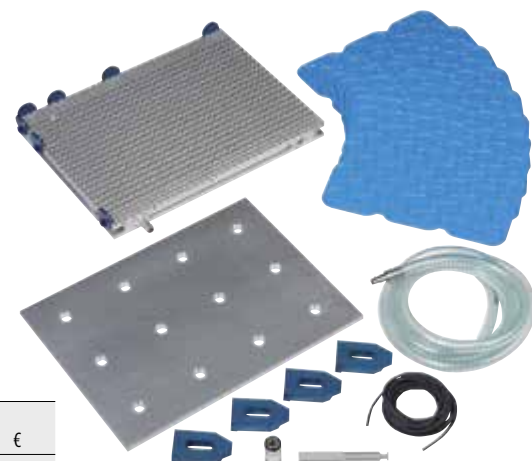
- **For wet and dry machining, with vacuum pump, no Venturi nozzle**
- **For workpieces with openings**  
Construction with sealing cord, aluminium adapter plate and adapter mats
- **For workpieces without openings**  
Construction with sealing cord only, directly on the grid plate
- The modular construction allows multiple vacuum plates to be connected with overlapping grids.  
The operating vacuum is supplied to the individual plates via the connection elements.

#### • Each set comprises:

- 1x modular grid plate with 12.5 mm grid
- 1x aluminium adapter plate with 12.5 mm grid
- Set VM1: 10 blue adapter mats
- Set VM2: 9 blue adapter mats, 1 black
- Set VM3: 8 blue adapter mats, 2 black
- 4x clamping claws with slot width = 14 mm
- 1x assembly tool for replacing blind plugs
- 3 m vacuum hose with wire helix
- 10 m vacuum sealing cord, Ø 4 mm, black

Type	Dimensions L x W x H mm	art.no.	€
VM1	300x200x32.5	<b>475083</b> 3021	1.149,-
VM2	400x300x32.5	475083 4031	2.029,-
VM3	600x400x32.5	475083 6041	2.599,-

4182



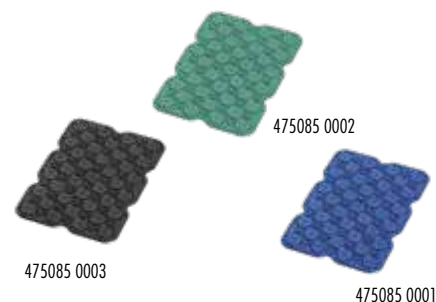


**Adapter mats**

- For vacuum clamping systems with adapter mats

Designation	Dimensions L x W x H mm	Colour	art.no.	€
For workpieces up to 25 kg	300x200x2.5	Blue	<b>475085 0001</b>	<b>7,35</b>
For workpieces over 25 kg	300x200x2.5	Green	475085 0002	7,45
For leak-free coverage	300x200x2.5	Black	475085 0003	7,45

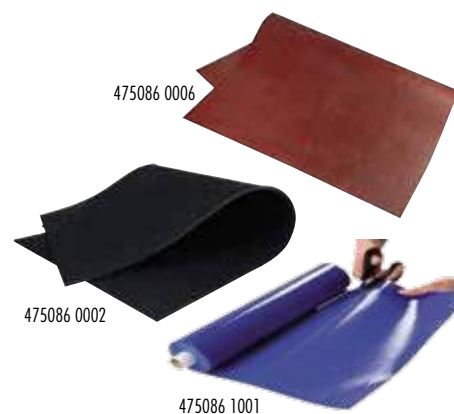
4182

**Rubber fixing mats**

- For slotted vacuum plates with and without Venturi nozzles
- Material may be removed during milling
- Black mats suitable for plane milling
- Blue mat for use with slotted vacuum plates

Designation	Dimensions L x W x H mm	Colour	art.no.	€
Standard	300x200x3	Brown	<b>475086 0001</b>	<b>14,25</b>
Standard	400x300x3	Brown	475086 0006	16,80
Standard	600x400x3	Brown	475086 0004	34,60
Millable	300x200x3	Black	475086 0002	14,25
Millable	400x300x3	Black	475086 0003	25,50
Millable	600x400x3	Black	475086 0005	34,60
Thin version	2000x400x1	Blue	475086 1001	90,60

4182

**Accessories**

- For vacuum clamping systems with adapter mats

Designation	L mm	art.no.	€
Sealing cord	50	<b>475084 0001</b>	<b>71,20</b>
Vacuum suction hose with wire helix	10	475084 0002	46,80

4182

**Vacuum pumps**

- Defoamer Art.-No. 742036 0001 is recommended for the liquid ring vacuum pump

Designation	Absorption capacity l/min	Dimensions	Noise level dB	Clamping surface	Weight kg	Nominal output	art.no.	€
Modular vacuum pump unit	16 m³/h	Ø 320 x 690 mm	60	< 0.5 m²	31	400 V / 0.55 kW	<b>475087 0002</b>	<b>2.899,-</b>
Liquid ring vacuum pump	25 m³/h	463 x 432 x 602 mm	50	< 1 m²	38	400 V / 0.88 kW	475087 0003	3.499,-
Modular vacuum pump unit	21 m³/h	Ø 320 x 690 mm	62	< 1 m²	34	400 V / 0.75 kW	475087 0005	3.469,-

4182



# Technology to get excited

The new ATORN zero-point clamping system fares well in any comparison

Experience the ATORN zero-point clamping system, which presents the advantages of its innovative and trend-setting characteristics in use.

## Advantages that lift the ATORN zero-point clamping system well above the competition

- **Use of different clamping fittings for maximum positioning precision:**
  - Zero-point fitting: Positions at the absolute zero reference point
  - Strut fitting: Fixes the remaining free axis in place
  - Undersize fitting: Is used exclusively for clamping and restraint
- **Two ways of setting different zero points**
  - Classic: The zero point is defined via the zero point fitting in combination with the strut fitting
  - Based on temperature effects: The zero point is defined via the centre axis by solely using strut fittings
- **System requires no maintenance**
  - Completely sealed system made of stainless steel to eliminate the need to maintenance when working
- **Advantages in use**
  - Absolute simplicity in use thanks to the large catchment tolerance and the non-jamming feed-in facility
- **Process safety thanks to advanced technology**
  - The characteristics of the 'three-cycle principle, form fit and a large ball diameter' further enhance the process safety. These characteristics optimally distribute the force, losing no effect in the process

## Advantages in use

### Large catchment tolerance

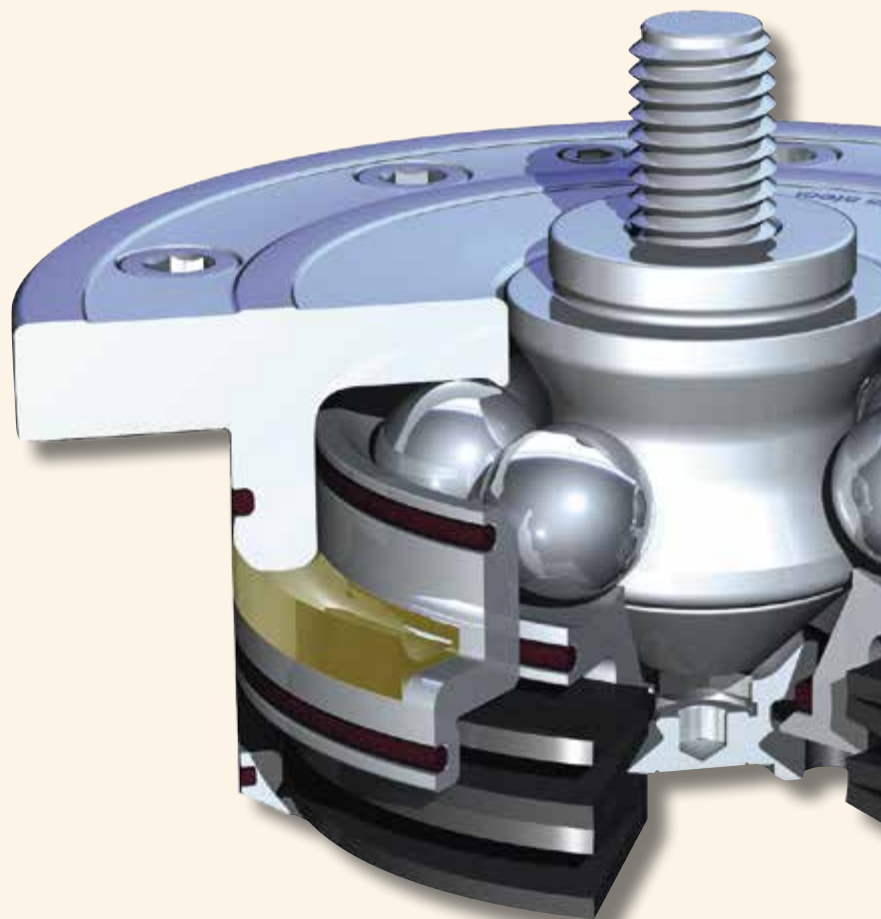


For the purpose of retracting a pallet into the clamping module, a pre-positioning of 6.5 mm or 12 mm is sufficient.

### Non-jamming



Non-jamming extension and retraction thanks to the ideal form of the clamp fitting



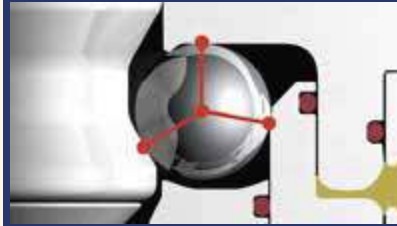
## Advantages in the technology

### Large retention, catchment and sealing forces



Size	Retention force (kN)	FCatchment/sealing force (kN)	
			hydr.
K 10.2	25	10	
K 20	55	20	

### Three-cycle principle



Force is distributed by way of a three-cycle principle. This avoids exert shear loads on the balls.

### Form fit



The balls are encompassed from three sides in a form-fit fashion. The forces are exerted evenly over the balls and are optimally spread out.

### Large ball diameter



Better distribution of forces thanks to larger ball diameter.

## Advantages in maintenance

### Rust-free – Robust – Suitable for industrial use



High-alloy, hardened tool steel. – This prevents corrosion. Robust, suitable for industrial use and with a long service life.

### No ball cage

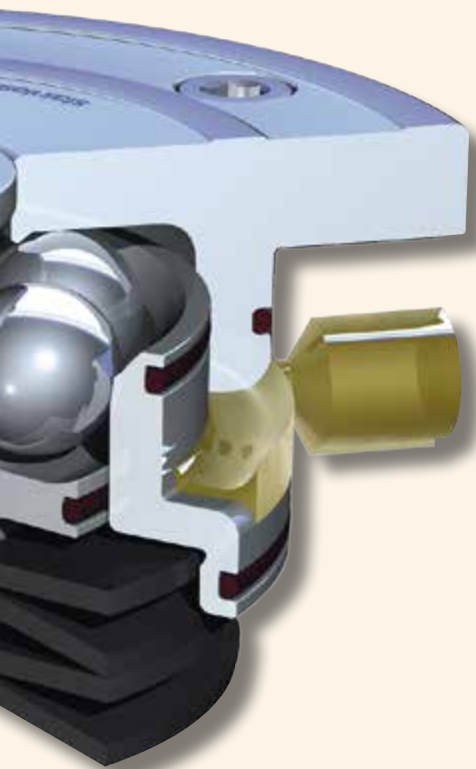


The balls are placed freely in the ball duct and continuously reposition themselves. As the balls are not in a cage, it is a quite simple process to blow out dirt using air.

### Safety system

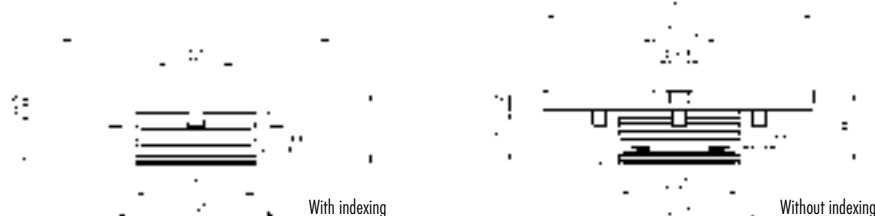


The system is absolutely process-safe. The clamping module can be opened at any time.



## ATORN® K10.2 and K20 installation clamping modules

- Hydraulic unlocking
- Hardened cover and piston
- Precision < 0.005 mm
- **Use:** Zero-point clamping system for optimised tooling times when clamping; for all areas of chip-forming and chip-free machining as well as the food, pharmaceutical and chemical industries.
- **Note:** Installation clamping modules boast high holding, pull-in and locking forces despite their extremely small dimensions. Hydraulic pressure is only required for releasing (min. 50 bar / max. 60 bar). The modules are mechanically locked when clamped. The advantage to this is the lack of inconvenient lines and of any risk of leaks.
- Available on request:
  - Installation drawings
  - Automation solutions
  - Also available as an individual flange version



### K10.2 with and without indexing

Model	Retaining force N	Retraction force/closing force kN	D mm	DN mm	D1 mm	H mm	HA mm	LK mm	M mm	K mm	T mm	Weight kg	art.no.	€
ohne Indexierung	25	10 kN	112	22	50	30	8	77	M6	-	22	0.6	459051 1010	475,-
mit Indexierung	25	10 kN	112	22	50	30	8	77	M6	8	22	0.6	459051 2010	589,-
4195														

### K20 with and without indexing

Model	Retaining force N	Retraction force/closing force kN	D mm	DN mm	D1 mm	H mm	HA mm	LK mm	M mm	K mm	T mm	Weight kg	art.no.	€
ohne Indexierung	55	20 kN	112	32	78	44	10	88	M6	-	34	1.4	459051 0020	809,-
mit Indexierung	55	20 kN	112	32	78	44	10	88	M6	8	34	1.4	459051 1020	879,-
4195														

## ATORN® K10.2 multi-clamping stations

- Hydraulic unlocking
- Precision < 0.005 mm
- Steel, unhardened
- The clamping systems are pre-equipped with attachment holes (for common table slot sizes 63, 100 and 125 mm) and positioning aids. The clamping stations are ready for immediate operation. Connections are pre-screwed.
- The clamping station with blow-out has 2 connections: 1 x hydr. opening, 1 x pneum. blow-out
- Installation drawings, further sizes and customised clamping stations for your machine are available on request.
- **Advantage:** Low overall height of just 36 mm



### Double clamping station

- For common table slot sizes 63, 100 and 125 mm

Retraction force/closing force kN	Retaining force N	Weight kg	art.no.	€
2 x 10 kN	25	14	459071 1002	1.939,-
4195				

### 4-place clamping station

- For common table slot sizes 63, 100 and 125 mm

Retraction force/closing force kN	Retaining force N	Weight kg	art.no.	€
4 x 10 kN	25	30	459073 1002	3.399,-
4195				



**6-place clamping station**

- For common table slot sizes 63, 100 and 125 mm

Retraction force/closing force kN	Retaining force N	Weight kg	art.no.	€
6 x 10 kN	25	46	<b>459075</b> 1002	<b>4.829,-</b>
4195				

**ATORN® K20 multi-clamping stations**

- Hydraulic unlocking
- Precision < 0.005 mm
- Steel, unhardened
- Attachment holes in the base plate can be provided to your specifications on request.
- The clamping station has 1 connection: 1 x hydr. opening
- Installation drawings, further sizes as well as customised clamping stations for your machine available on request.
- **Benefit:** Low overall height of just 46 mm

**Double clamping station**

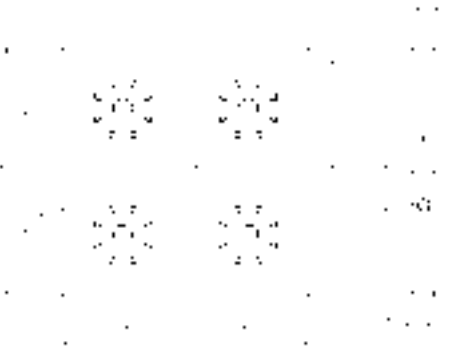
Retraction force/closing force kN	Retaining force N	A mm	B mm	HA mm	K mm	L mm	L1 mm	N mm	R mm	S mm	SM mm	Weight kg	art.no.	€
2 x 20 kN	55	196	396	10	19	45	180	20	G1/4	46	200	21.9	<b>459071</b> 2002	<b>2.929,-</b>
4195														

**4-place clamping station**

Retraction force/closing force kN	Retaining force N	A mm	B mm	HA mm	K mm	L mm	L1 mm	N mm	R mm	S mm	SM mm	Weight kg	art.no.	€
4 x 20 kN	55	396	396	10	19	50	180	20	G1/4	46	200	44	<b>459073</b> 2002	<b>4.329,-</b>
4195														

**6-place clamping station**

Retraction force/closing force kN	Retaining force N	A mm	B mm	HA mm	K mm	L mm	L1 mm	N mm	R mm	S mm	SM mm	Weight kg	art.no.	€
6 x 20 kN	55	396	596	10	20	50	200	20	G1/4	46	200	75	<b>459075</b> 2002	<b>8.019,-</b>
4195														

**ATORN® Interchangeable pallets for K10.2 and K20**

- High-strength aluminium
- Includes clamping bolts and clamping bolt screws
- **Note:** Attachment holes can be provided in interchangeable pallets on request.
- Other dimensions, pitch variation and clamping bolt quantities are available on request



for clamping station	A mm	B mm	L mm	R	S mm	SM mm	Weight kg	art.no.	€
K10.2 / 2-fold	166	396	90	M12	30	200	6	<b>459070</b> 1002	<b>460,-</b>
K10.2 / 4-fold	366	366	200	M12	30	200	10	459070 1004	<b>709,-</b>
K10.2 / 6-fold	366	566	200	M12	30	200	16	459070 1006	<b>959,-</b>
K20 / 2-fold	196	396	120	M12	40	200	6	459070 2002	<b>460,-</b>
K20 / 4-fold	396	396	200	M12	40	200	16	459070 2004	<b>779,-</b>
K20 / 6-fold	396	596	200	M12	40	200	25	459070 2006	<b>1.079,-</b>

4195



## ATORN® Clamping bolts and clamping bolt screws

### Clamping bolts

- Hardened, for hydraulic clamping modules

Type	DN mm	D1 mm	D2 mm	H mm	H1 mm	M mm	T mm	art.no.	€
Zero-point bolts K10.2	22.0	15	8	19	16	-	3	459061 1001	41,50
Strut bolts K10.2	22.0	15	8	19	16	-	3	459061 1002	41,50
Undersize bolts K10.2	21.8	15	8	19	16	-	3	459061 1003	41,50
Protective bolts K10.2	21.8	-	-	-	-	M8	-	459061 1004	41,50
Zero-point bolts K20	32.0	25	12	28	23	-	5	459061 2001	79,40
Strut bolts K20	32.0	25	12	28	23	-	5	459061 2002	79,40
Undersize bolts K20	31.8	25	12	28	23	-	5	459061 2003	79,40
Protective bolts K20	31.8	-	-	-	-	M8	-	459061 2004	79,40

4167

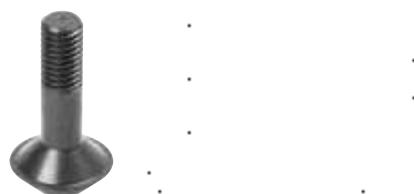


### Clamping bolt screws

- Strength class 12.9
- Versions in other lengths and materials (e.g. stainless steel) available on request

for type	M mm	L mm	L1 mm	art.no.	€
K10,2	M8	37	6	459062 1001	15,60
K20	M12	54	9	459062 2001	18,15

4167



## ATORN® Air hydraulic pump and connection set

- For opening hydraulic clamping modules or clamping stations.
- Compact, pneumatically operated hydraulic pump for single-acting circuits
- Integrated safety valve for regulating the hydraulic output pressure (factory-set to a maximum operating pressure of 60 bar)
- The expansion body in the oil tank enables the pump to be used horizontally and vertically.
- Connecting thread, air: G1/4
- Connecting thread, oil: G1/4
- **Note:** the pump is filled with a standard commercial hydraulic oil (HLP32) ready for use



1. Air intake,  
2. Hydraulic outlet

### Air hydraulic pump

Air pressure min.	Air pressure max. bar	Usable oil vol. cm³	Transport vol. max. cm³/min	Weight kg	art.no.	€
4	6	1000	750	5.9	459078 0001	689,-

4195

### Connection set

- For connecting the clamping station and air hydraulic pump

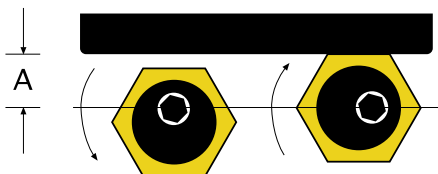
Description	art.no.	€
Connection set incl. manometer	459078 0007	182,50

4195

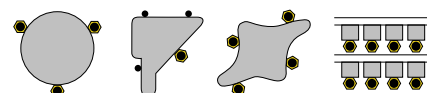


## Eccentric clamps

- For fixture plates
- Eccentric head causes the clamping motion and clamping force (up to 27 kN)
- The hexagonal brass washer acts as a clamp
- Any workpiece shape can be clamped with positioning pins and one or two clamping screws
- Low height allows workpiece surfaces to be machined easily
- No need to consider the position of clamping claws in CNC programming
- Space-saving multi-clamping due to low height



It is easy and cost-effective to clamp parts of all shapes:



### Eccentric anchor clamps

Clamp force kN	Interior hexagon mm	Thread	Thread length mm	Wr. width mm	Wr. width height mm	Eccentric travel mm	Contents	art.no.	€
0.9	3	M4	10	8	2.8	0.8	10 units	<b>475001 0003</b>	<b>68,70</b>
3.4	4	M6	12	16	4.8	1.3	10 units	475001 0004	<b>67,70</b>
3.6	5	M8	16	20	4.8	1	12 units	475001 0005	<b>83,60</b>
3.63	5	M8/V2A	16	20	6.4	1	4 units	475001 0015	<b>107,-</b>
9	7	M10	20	20	6.4	1.6	10 units	475001 0007	<b>76,30</b>
18	8	M12	25	25	9.5	2	8 units	475001 0008	<b>83,90</b>
27	12	M16	30	30	12.7	2.5	4 units	475001 0012	<b>63,10</b>

4156



### Spare hexagonal washers

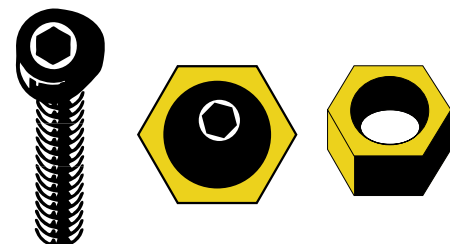
Thread	Contents	art.no.	€
M4	10 units	<b>475005 0004</b>	<b>36,50</b>
M6	10 units	475005 0006	<b>38,80</b>
M8 V2A	8 units	475005 0080	<b>80,40</b>
M8	8 units	475005 0008	<b>32,80</b>
M10	4 units	475005 0010	<b>17,20</b>
M12	4 units	475005 0012	<b>22,80</b>
M16	4 units	475005 0016	<b>30,30</b>

4156

### Spare screws

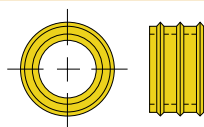
Thread	Contents	art.no.	€
M4	10 units	<b>475003 0004</b>	<b>52,40</b>
M6	10 units	475003 0006	<b>57,-</b>
M8 V2A	8 units	475003 0080	<b>159,-</b>
M8	8 units	475003 0008	<b>46,10</b>
M10	4 units	475003 0010	<b>23,80</b>
M12	4 units	475003 0012	<b>32,80</b>
M16	4 units	475003 0016	<b>55,-</b>

4156



## Fastening disc

- Suitable for clamping raw and cast parts as well as untreated surfaces
- Made from case-hardened steel
- Each pack contains fastening discs and eccentric screws



Clamp force kN	Interior hexagon mm	Thread	Thread length mm	Height mm	Ø mm	Contents	Eccentric travel mm	art.no.	€
9	7	M10	20	6.4	20.6	8 units	1.6	<b>475007 0010</b>	<b>189,-</b>
18	8	M12	22.5	9.6	25.4	8 units	2	475007 0012	<b>164,50</b>
27	12	M16	26.8	12.7	30.1	4 units	2.5	475007 0016	<b>107,-</b>

4156





## Eccentric clamping screws

- **For T-slots**
- Connecting the normal clamping elements to slot nuts using eccentric screws (with brass hexagonal washers or fastening discs) allows workpieces to be clamped cost-effectively on work tables or clamping plates with T-slots.
- A screw secures the T-slot nut in the T-slot
- Low height; surfaces of flat parts can also be machined
- Rapid adjustment to various workpiece sizes and parts of any shape, no rectangular lateral surfaces required
- Clamping force up to 27 kN
- Supplied with brass washer and slot nut



Clamp force kN	Interior hexagon mm	Thread	Thread length mm	Wr. width mm	Wr. width height mm	Eccentric travel mm	for T-slot mm	Contents	art.no.	€
3.4	4	M 6	12	16	4.8	1	8	2 units	<b>475012 0408</b>	<b>58,-</b>
3.4	4	M 6	12	16	4.8	1	10	2 units	475012 0410	<b>59,50</b>
3.6	5	M 8	16	21	4.8	1	12	2 units	475012 0512	<b>61,60</b>
9	7	M10	20	21	6.4	1.6	14	2 units	475012 0714	<b>62,10</b>
18	8	M12	25	25	9.5	2	16	2 units	475012 0816	<b>63,60</b>
18	8	M12	25	25	9.5	2	18	2 units	475012 0818	<b>67,20</b>
27	12	M16	30	30	12.7	2.5	20	2 units	475012 1220	<b>67,20</b>
27	12	M16	30	30	12.7	2.5	22	2 units	475012 1222	<b>117,-</b>

4156



### Set

- 6 x eccentric clamping screws (with brass washers)
- 4 x slot nuts
- 2x hex keys

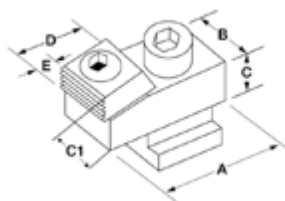
T-slot size mm	art.no.	€
8	<b>475014 0008</b>	<b>138,50</b>
10	475014 0010	<b>139,50</b>
12	475014 0012	<b>139,50</b>
14	475014 0014	<b>143,50</b>
16	475014 0016	<b>148,50</b>
18	475014 0018	<b>157,-</b>
20	475014 0020	<b>219,-</b>
22	475014 0022	<b>290,-</b>

4156



## Pull-down clamping claw

- Pull-down effect
- For 14 mm, 16 mm and 18 mm T-slots, and for mounting directly on the fixture plate or work table
- M12 eccentric clamping screw for clamping force of 18 kN
- Body and clamping washer case-hardened
- Clamping washer with toothed edge for raw parts and smooth edge for machined parts
- The clamping washer adapts to the angular position of the workpiece, i.e. the workpiece does not have to be rectangular



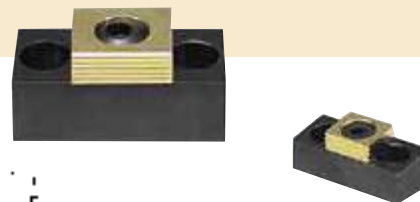
A mm	B mm	C mm	C front side mm	D mm	Eccentric travel mm	T-slot size mm	art.no.	€
50	28.5	16	12.7	25.5	2	14	<b>475050 0014</b>	<b>75,80</b>
50	28.5	16	12.7	25.5	2	16	475050 0016	<b>75,80</b>
50	28.5	16	12.7	25.5	2	18	475050 0018	<b>82,40</b>
50	28.5	16	12.7	25.5	2	Without T-slot nut	475050 0000	<b>66,20</b>

4156



## Combination pull-down claw

- The pull-down effect ensures that the workpiece is secured to the support
- The front side is used for clamping, the rear side can be used as a stop
- Space-saving multi-clamping
- Clamping washer with toothed surface for raw parts and smooth surface for machined parts
- Preferably for mounting in a slot of width B (+0.05 mm)
- The engagement height of the clamping washer can be changed by the depth of the slot
- Body and clamping washer are case-hardened
- Supplied with fastening screws

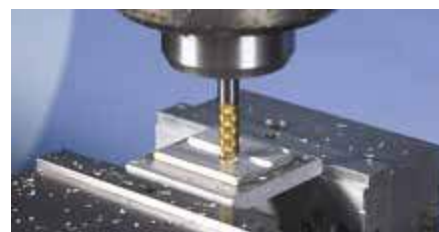


A mm	B mm	C mm	D mm	E mm	F mm	G mm	Eccentric screw	Eccentric travel mm	Attachment screw	art.no.	€
43.2	19	12.7	25.4	2.3	19	6.4	M10 x 1.5	1.6	M8 x 16	475051 0008	67,20
54	25.4	11.4	33.5	2.8	25.4	9.7	M12 x 1.75	2	M10 x 20	475051 0010	78,90
75	38.1	25.2	50.8	3.3	38.1	12.7	M16 x 2	2.5	M12 x 30	475051 0012	165,-

4156

## Clamping film

- For clamping workpieces that cannot otherwise be clamped due to their instability, shape or lack of magnetic properties
- The workpiece and film are heated to 85 - 95 °C (furnace, heating plate, hot air etc.)
- After cooling, the holding force is approx. 30 - 200 N/cm<sup>2</sup> depending on the type or supporting surface
- Allows machining on thin or difficult-to-clamp parts
- Can also be used to reinforce thin workpieces during machining
- Film can be used with steel, non-ferrous metals, glass, wood, most plastics and many other materials
- Contains no harmful chemicals

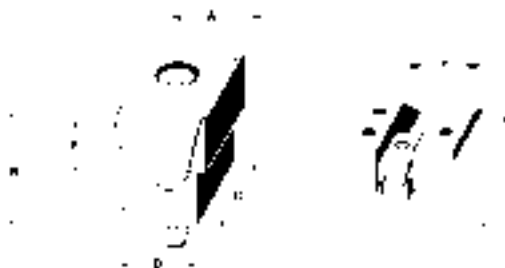
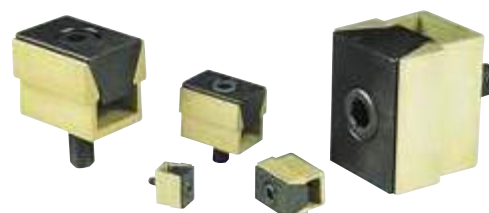


Description	art.no.	€
Clamping film, roll 250 mm x 7600 mm	475100 3076	229,-
Clamping film, roll 300 mm x 1500 mm	475100 3015	59,-

4156

## Double wedge clamp

- One clamping element simultaneously clamps two workpieces
- Space-saving multi-clamping reduces auxiliary processing times and therefore unit costs
- Cost-effective clamping fixture
- For round and rectangular parts
- Clamping force up to 27 kN
- The use of a support and clamping bar further simplifies the process of constructing clamping fixtures

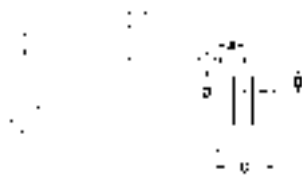


Clamp force kN	Spread mm	Interior hexagon mm	Thread	A mm	B mm	D mm	C mm	E mm	F mm	Contents	art.no.	€
0.9	0.2	1.5	M2	6.1	6.9	5.3	8.1	3.6	6.3	6 units	475034 0002	111,50
1.4	0.5	2	M2.5	9.1	9.7	7.9	11.9	4.7	9.5	6 units	475034 0025	111,50
2.2	1.4	3	M4	12.3	14.5	10.4	15.9	5.6	12.7	8 units	475034 0004	109,50
6.8	1.8	5	M6	18.6	19	16.1	23.8	9.5	19	6 units	475034 0006	113,50
8.9	2.4	6	M8	24.8	25.9	20.8	31.7	12.7	25.4	4 units	475034 0008	90,40
15.6	3.1	10	M12	37.3	38.6	30.8	47.6	19	38.1	2 units	475034 0012	197,50
26.7	3.8	14	M16	49.7	51.5	41.2	63.4	25.3	50.8	2 units	475034 0016	298,-

4156

## Pitbull anchor clamps

- Pull-down effect with clamping forces up to 50 kN
- Sharp-edged for raw parts (cast iron, forged, cut parts) or with a blunt edge to avoid clamping marks
- Space-saving
- Low height
- Compact design
- High clamping force
- Strong pull-down
- No protruding edges to interfere with tools
- Multi-sided machining
- Ideal for multi-clamping
- **Note:** Dimensions B and D are guideline values



Brass

Hard. steel, blunt

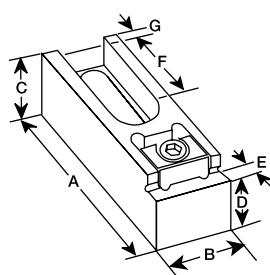
Hard. steel, sharp

Type of clamping edge	Substance	A mm	B mm	C mm	D mm	Thread	Clamping width mm	Clamping force N-m	Tightening torque N-m	Clamping route mm	☒	art.no.	€
Sharp	Hard. steel	3.8	3.6	9.5	1.9	M 2.5	9.5	2800	1.8	0.15	1	<b>475036 0250</b>	<b>189,-</b>
Blunt	Hard. steel	3.8	3.6	9.5	1.9	M 2.5	9.5	2800	1.8	0.15	1	475036 0251	<b>187,50</b>
Blunt	Brass	3.8	3.6	9.5	1.9	M 2.5	9.5	900	0.6	0.15	1	475036 0252	<b>189,50</b>
Sharp	Hard. steel	5.1	4.8	12.7	2.6	M 4	12.7	6600	5.6	0.4	1	475036 0400	<b>195,50</b>
Blunt	Hard. steel	5.1	4.8	12.7	2.6	M 4	12.7	6600	5.6	0.4	1	475036 0401	<b>192,50</b>
Blunt	Brass	5.1	4.8	12.7	2.6	M 4	12.7	1800	2.8	0.4	1	475036 0402	<b>196,50</b>
Sharp	Hard. steel	7.6	7.2	19.05	3.8	M 6	19.1	16000	22.5	0.6	1	475036 0600	<b>188,50</b>
Blunt	Hard. steel	7.6	7.2	19.05	3.8	M 6	19.1	16000	22.5	0.6	1	475036 0601	<b>187,-</b>
Blunt	Brass	7.6	7.2	19.05	3.8	M 6	19.1	4200	5.6	0.6	1	475036 0602	<b>189,50</b>
Sharp	Hard. steel	10.2	11.4	25.4	6.3	M 10	25.4	26000	40	1.7	1	475036 1000	<b>188,50</b>
Blunt	Hard. steel	10.2	11.4	25.4	6.3	M 10	25.4	26000	40	1.7	4	475036 1001	<b>188,50</b>
Sharp	Hard. steel	15.2	16.3	38.1	9.5	M 12	38.1	50000	145	1.9	2	475036 1200	<b>173,-</b>
Blunt	Hard. steel	15.2	16.3	38.1	9.5	M 12	38.1	50000	145	1.9	2	475036 1201	<b>173,-</b>

4156

## Pitbull universal anchor clamps

- **For T-slots**
- Can be used on fixture plates, T-slot work tables, grid plates, clamping cubes, etc.
- Base body hardened, supporting surfaces ground
- Supplied without fastening screw or T-slot nut



A mm	B mm	C mm	D h6 mm	E mm	F mm	G mm	H mm	Clamping force N-m	Screw	for T-slot mm	Clamping width mm	art.no.	€
104	31.7	25	18.54	9.1	43.2	12.7	0.6	1600	M 12	14, 16, 18	19.1	<b>475038 0120</b>	<b>130,50</b>
107	38.1	41	35	9.1	38.6	10.9	1.25	2600	M 16	22, 24	25.4	475038 0160	<b>346,-</b>

4156



Radial run-out ...

... 3 µm

**ATORN**<sup>®</sup>  
Performance demands quality

## AMF Mini-Bulle flat clamp

- Hardened and tempered to a burnished shade
- h1 = at maximum T-slot depth in accordance with DIN 650
- To obtain low clamping heights with minimum slot depths, the clamp can be ground down by x mm
- Allows particularly flat workpieces to be clamped
- Clamping jaws have a wedge effect that ensures the workpiece is securely fixed to the work table
- Horizontal forces are absorbed by a screw corresponding to the slot size; this holds the clamp securely in position without damaging the table
- **Supplied in pairs**, boxed, complete with fastening screws (DIN 912, 8.8 / ISO 4762) and a hexagonal screwdriver (ISO 2936)
- Prices per pair

c mm	h min. mm	h max. mm	x mm	l max. mm	b mm	h1 mm	h2 mm	F1 kN	F2 kN	Groove width mm	art.no.	€
1.8	2.5	13.5	5	52	18	7	11	5	0.6	12	<b>466102 0012</b>	<b>94,10</b>
1.8	1.5	13.5	5	55	22	8	11	5.5	0.7	14	466102 0014	109,-
2.5	2.5	17	6	68	25	9	15	8	0.9	16	466102 0016	122,-
2.5	1.5	16	6	71	28	10	15	9	1	18	466102 0018	126,50
3	4.5	21.5	9	89	35	14	20	16	1.9	22	466102 0022	193,-

4157



## Clamping bolts

- Secure, safe, precise and powerful clamping for practically any workpiece shape
- Also suitable as a clamping support
- Length tolerance class js6, ensures that clamping is parallel to the table
- Standard clamping range 8 - 40 mm, can be extended to a maximum of 87 mm using clamping screws
- Description:
  1. Clamping range
  2. Length (js6)
  3. Wrench size 18
  4. Clamping screw
  5. Clamping ring
  6. Diameter 22 mm
  7. Wrench size 36 mm
  8. Spacer washer

### Clamping bolts

- Supplied with M10 threaded bolts, spacer washer, clamping screw, clamping ring

Description	L mm	Clamping range mm	art.no.	€
With fixed thread M10	50	8 - 40	<b>476001 0050</b>	<b>114,-</b>
With replaceable threaded bolts M10	100	8 - 40	476001 0100	122,50
With replaceable threaded bolts M10	150	8 - 40	476001 0150	170,-

4140

### Clamping screws

Clamping range mm	art.no.	€
8 - 40	<b>476002 0840</b>	<b>34,50</b>
40 - 67	476002 4067	62,60
65 - 87	476002 6587	75,80

4140

### Clamping ring

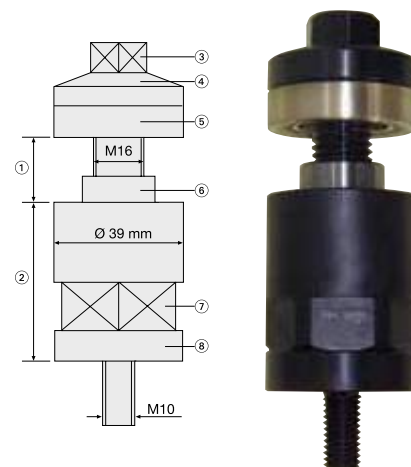
Designation	art.no.	€
Clamping ring	<b>476003 0001</b>	<b>27,30</b>

4140

### Threaded bolts

Thread	art.no.	€
M10	<b>476004 0010</b>	<b>29,-</b>
M12	476004 0012	29,-
M14	476004 0014	29,-
M16	476004 0016	29,-

4140



## AMF Side clamp

- M12 x 14, complete with slot nut
- Base body made from case-hardened steel, nitrided
- Tensioning hook made from case-hardened steel
- Tightening torque 75 Nm
- Attachment with screws, strength class 10.9
- Compact design
- Pull-down effect ensures that workpieces are securely and safely attached
- Increased plate tension for adding bores and slots
- Clamps plates laterally, allowing the full surface to be machined without any protruding contours
- Lateral thread allows a stop to be attached
- Can be used horizontally and vertically
- Reduced tooling costs
- Diverse and variable applications
- Can be used as a clamping element and as a fixed stop
- Moving the adjustment screw causes tensioning hooks to clamp the workpiece. At the same time, a pull-down effect is created on the supporting surface.
- Attaching a lateral stop enables the workpiece to be clamped repeatedly in the same position.



Thread	H mm	F1 kN	F2 kN	Groove width mm	art.no.	€
M12	65 ± 0.1	12	7	14	467040 1214	270,-

4157

### Base plate, transverse

- For clamping at right angles to the table slot
- Base body made from tempering steel, hardened and burnished
- Attachment with screws, strength class 10.9
- M12 x 14, complete with slot nut

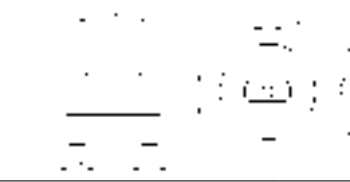


Groove width mm	Thread	H mm	art.no.	€
14	M12	30 ± 0.1	467041 1214	141,-

4157

### Base plate

- Precise side clamp movement by means of an alignment block on the work table
- Workpiece support increased by 30 mm
- Base body made from tempering steel, hardened and burnished
- Attachment with screws, strength class 10.9

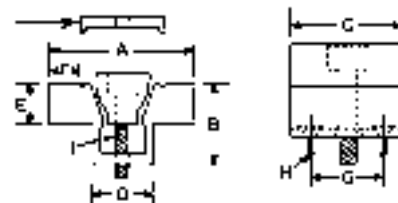


Groove width mm	Thread	H mm	art.no.	€
14	M12	30 ± 0.1	467042 1214	94,60

4157

## Form-fit double wedge clamp

- Extra wide jaws, can be milled to fit the shape of the workpiece
- For securely clamping difficult parts
- Clamps unstable parts without distortion
- Space-saving
- Allows two workpieces to be clamped simultaneously
- Higher productivity due to reduced auxiliary processing times
- Ideal for machining centres as well as milling and drilling machines
- **Note:** A locking plate is used during form milling to ensure that the jaws remain in a stable position and vibration-free.
- Supplied with wedge clamp and screw



Clamp force kN	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	Locking plate	art.no.	€
2.2	28.6	12.7	15.7	10.6	6.3	4.6	10.2	M 2.5	M 4	Yes	475035 0040	39,70
2.2	28.6	12.7	15.7	10.6	6.3	4.6	10.2	M 2.5	M 4	No	475035 0041	36,70
6.8	38.1	19	23.9	16.1	9.4	6.6	15.9	M 4	M 6	Yes	475035 0060	41,20
6.8	38.1	19	23.9	16.1	9.4	6.6	15.9	M 4	M 6	No	475035 0061	38,90
9	50.8	25.4	31.8	20.8	12.7	9.9	20.6	M 4	M 8	Yes	475035 0080	57,50
9	50.8	25.4	31.8	20.8	12.7	9.9	20.6	M 4	M 8	No	475035 0081	54,40
16	76.2	38.1	47.5	30.9	19.1	15.7	30.5	M 5	M 12	Yes	475035 0120	159,-
16	76.2	38.1	47.5	30.9	19.1	15.7	30.5	M 5	M 12	No	475035 0121	153,-
27	101.6	50.8	63.5	41.3	25.4	20.3	41	M 6	M 16	Yes	475035 0160	260,-
27	101.6	50.8	63.5	41.3	25.4	20.3	41	M 6	M 16	No	475035 0161	253,-

4156





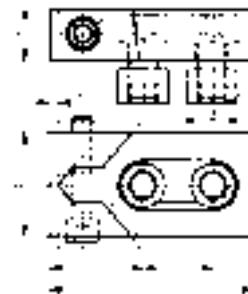
## AMF Bulle deep clamping jaws

- Hardened and tempered to a burnished shade
- **Supplied in pairs**, boxed, complete with fastening screws (DIN 912, 10.9 / ISO 4762), T-slot nuts (DIN 508) and a hexagonal screwdriver (ISO 2936)
- Prices per pair



Groove width mm	c mm	h mm	b mm	l mm	l1 mm	l2 mm	d mm	F1 kN	F2 kN	art.no.	€
12	3	20	40	80	26	39	M10	16	0.6	<b>466103 0012</b>	<b>104,50</b>
14	3	20	40	80	26	39	M12	22	0.9	466103 0014	114,-
16	3	20	40	80	26	39	M12	22	0.9	466103 0016	121,50
16	4	25	50	100	34	46	M14	32	1.2	466103 1016	143,-
18	4	25	50	100	34	46	M16	36	1.4	466103 0018	148,50
20	4	25	50	100	34	46	M16	36	1.4	466103 0020	158,50
22	5	30	78	140	50	65	M20	36	1.4	466103 0022	266,-
24	5	30	78	140	50	65	M20	36	1.4	466103 0024	283,-
28	5	30	78	140	50	65	M24	40	1.6	466103 0028	339,-
30	5	30	78	140	50	65	M24	40	1.6	466103 0030	385,-

4157

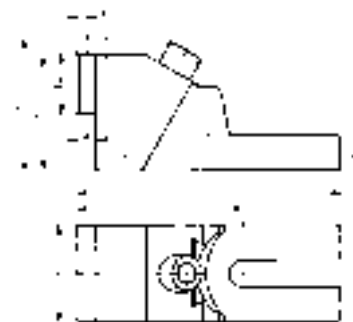
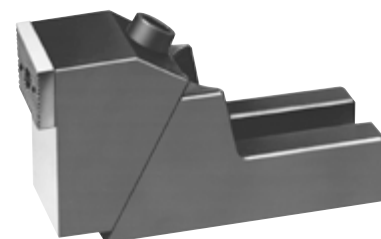


## AMF Heavy-duty clamping jaws

- **Reversible clamping jaws**
- High design with precise V-shaped guide
- Base body: Malleable cast iron
- Clamping jaws: Case-hardened steel
- Reversible clamping jaws with smooth side for machined workpieces and grooved side for raw clamping surfaces
- Robust clamping jaws with large clamping surfaces, ideal for laterally clamping high workpieces
- We recommend using two clamping screws to secure the heavy-duty clamping jaws to the work table! DIN 787 T-slot screws must be ordered separately for use as fastening screws (two per clamping jaw), depending on the slot width.

Groove width mm	b1 mm	c mm	h mm	h1 mm	h2 mm	h3 mm	b mm	l mm	l1 mm	e mm	art.no.	€
12 - 18	19	8	85	38	99	40	65	179	112.5	12	<b>466105 0019</b>	<b>282,-</b>
20 - 30	26	11	100	45	118	40	75	230	138.5	12	466105 0026	385,-
32 - 42	38	15	120	56	145	40	90	265	158	12	466105 0038	559,-

4157



# Hydraulic expansion chucks



- Reduced-vibration tool clamping
- Increased tool endurance
- Reduced micro-nicks on the tool cutting edge
- High torque transfer
- High level of positioning accuracy and precision

## Mandrels

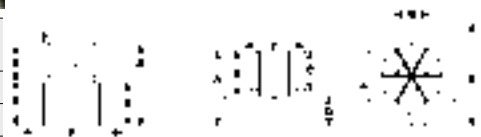
- Almost every workpiece has at least one bore. These are suitable for clamping the workpiece (turning, milling, drilling part) to allow machining on the second side.
- 5-sided machining
- Space saving design for multi-clamping
- Mandrel can be easily turned and milled to the desired diameter
- Easy to use

### For through-holes

- Fastening flange diameter is concentric to the clamping diameter
- Clamping screw, hardened and coated
- Supplied with 3 fastening screws (H)

A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	art.no.	€
10.7	7.6	6.1	3	20 h9	7.4	4.1	M2 on PC Ø 13.7	M 2	4.1	<b>475041 0020</b>	<b>75,30</b>
21.8	16	15	5.9	29.72 h9	12.4	7.2	M3 on PC Ø 21	M 4	8	475041 0040	<b>76,10</b>
24.9	19	15	5.9	31.5 h9	14.2	12.2	M3 on PC Ø 23.1	M 6	12	475041 0060	<b>80,-</b>
24.9	19	15	5.9	37.5 h9	20	13.5	M3 on PC Ø 29	M 8	14	475041 0080	<b>84,50</b>
28.6	22.2	17.5	6.4	50 h8	27	18	M4 on PC Ø 39.4	M 10	17	475041 0100	<b>108,50</b>
31.8	25.4	20.6	6.4	56 h8	35.3	25.4	M4 on PC Ø 45.5	M 12	21	475041 0120	<b>135,-</b>
39.6	31.8	27	7.9	69.5 h8	42	30	M5 on PC Ø 55.9	M 16	22	475041 0160	<b>173,-</b>
39.6	31.8	27	7.9	75.5 h8	51	30	M5 on PC Ø 63.9	M 16	22	475041 0161	<b>186,-</b>
45.5	37.6	32.3	7.9	107.5 h8	77	30	M6 on PC Ø 92.5	M 16	20	475041 0162	<b>324,-</b>
45.5	38	32	8	132.9 h9	103	30	M6 on PC Ø 118	M 16	20	475041 0163	<b>420,-</b>

4156



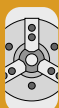
4156

### For blind bores

- Available in various sizes, although turned or milled by the user to the specific diameter of the workpiece
- Supplied with lock ring

suitable for	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	L mm	Interior hexagon mm	Clamp force kN	art.no.	€
Lathe	44.4	25	21	19	53.3	53.3	18	25	45	6	20	<b>475042 0444</b>	<b>285,-</b>
Milling machine	41.0	22	17.5	19	50	28.7	17.8	M 4	39.4	6	20	475042 0410	<b>192,50</b>

4156



## Compact clamp

- Compact design
- Clamping force up to 16 kN
- Special polyamide seal protects the inside from dirt
- Ideal access when machining
- Clamps workpieces quickly
- Supplied without chuck key or clamping screw

### Compact clamp

A mm	A1 mm	B mm	r mm	H mm	Cyl. Screws DIN 912	Clamp force kN	Illustration	art.no.	€
88	42	40	75	78	M10 / M12	16	1	<b>468010 0088</b>	<b>271,-</b>
97	42	60	94	78	M10 / M12	12	1	468010 0097	<b>280,-</b>
97	42	60	94	78	M10 / M12	12	2	468010 0197	<b>280,-</b>

4192

Casing and lever arm made from tempering steel



Figure 1



Figure 2

### Clamp base

Clamping height mm	Cyl. Screws DIN 912	art.no.	€
80	M10 / M12	<b>468011 0010</b>	<b>85,40</b>

4192





## AMF Clamp sets

DIN  
6314VDIN  
6316V

- With adjustable support screw
- Tempering steel, painted
- Complete with DIN 787 T-slot screws, nuts and washers
- Supplied without notched clamping lever, please order separately

### Bevelled, DIN 6314 V

T-groove dimension a mm	T-groove screw DIN 787	Clamping height mm	d mm	e1 mm	e2 mm	art.no.	€
10	M10 x 80	8 - 32	M10	15	30	466005 0010	28,30
12	M12 x100	10 - 40	M12	21	40	466005 0012	32,80
14	M12 x100	10 - 38	M12	21	40	466005 0014	32,80
16	M16 x125	13 - 48	M16	26	45	466005 0016	45,-
18	M16 x125	13 - 46	M16	26	45	466005 0018	46,90
20	M20 x160	16 - 65	M20	30	60	466005 0020	73,80
22	M20 x160	16 - 65	M20	30	60	466005 0022	74,30

4157

### Offset, DIN 6316 V

T-groove dimension a mm	T-groove screw DIN 787	Clamping height mm	d mm	e1 mm	e2 mm	art.no.	€
10	M10 x 80	22 - 46	M10	36	32	466010 0010	38,20
12	M12 x100	28 - 58	M12	44	40	466010 0012	44,-
14	M12 x100	28 - 56	M12	44	40	466010 0014	44,20
16	M16 x125	36 - 71	M16	51.5	50	466010 0016	59,50
18	M16 x125	36 - 69	M16	51.5	50	466010 0018	60,10
20	M20 x160	43 - 92	M20	59	70	466010 0020	94,60
22	M20 x160	43 - 92	M20	59	70	466010 0022	95,10

4157

### Notched clamping lever

- Steel, burnished

Thread	l mm	d mm	h mm	suitable for				art.no.	€
M12	135	33	48	4660050012	4660050014	4660100012	4660100014	466011 0012	62,60
M16	158	40	64	4660050016	4660050018	4660100016	4660100018	466011 0016	72,30

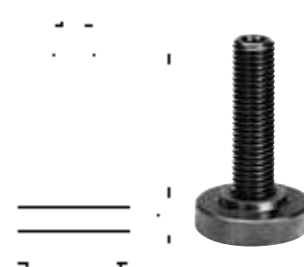
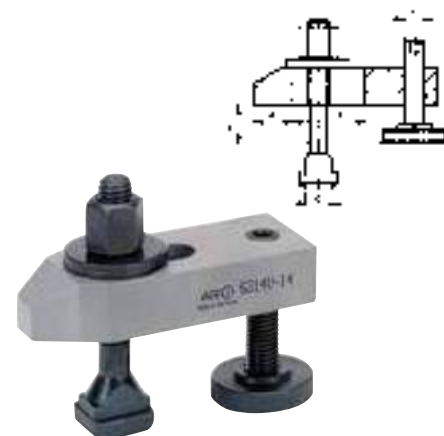
4157

### Support screw, DIN 6314 S

- Hardened and tempered
- Strength class 8.8

Thread	d mm	l1 mm	l mm	art.no.	€
10	30	8	39	466012 0010	11,70
12	36	10	49	466012 0012	12,25
12	36	10	94	466012 0112	17,50
16	42	13	55	466012 0016	15,40
16	42	13	90	466012 0116	20,80
20	50	16	69	466012 0020	22,90
20	50	16	109	466012 0120	26,60

4157



## AMF Clamp holder

- Spring-loaded, with brass locking screw
- The clamp holder supports the clamp when positioning and removing the workpiece. This makes unclamping both quick and safe.

Model	D mm	d mm	l mm	l1 mm	Spring deflection mm	suitable for screws	art.no.	€
1	22	10.5	30	22	8	M8 - M10	466055 0001	21,10
2	26	14.5	32	22	10	M12 - M14	466055 0002	22,70
3	32	18.5	38	26	12	M16 - M18	466055 0003	23,90
4	38	22.5	40	28	12	M20 - M22	466055 0004	26,80
5	45	27.5	44	32	12	M24 - M27	466055 0005	32,60

4157



## AMF Clamps

DIN  
6314DIN  
6315BDIN  
6316

- Tempering steel, painted

## Standard version, DIN 6314

Slot width mm	l mm	a mm	b2 mm	b3 mm	e1 mm	e2 mm	for screws	art.no.	€
6.6	50	10	20	8	10	20	M6	466020 0007	6,55
9	60	12	25	10	13	22	M8	466020 0009	7,55
11	80	15	30	12	15	30	M10	466020 0011	9,40
14	100	20	40	14	21	40	M12 M14	466020 0014	9,55
18	125	25	50	18	26	45	M16 M18	466020 0018	12,95
22	160	30	60	22	30	60	M20 M22	466020 0022	24,10
26	200	30	70	26	35	80	M24	466020 0026	34,40
33	250	40	80	34	45	100	M30	466020 0033	89,50

4157

## Forked clamp, bevelled, DIN 6315 B

Slot width mm	l mm	a mm	b2 mm	b3 mm	b4 mm	for screws	art.no.	€
6.6	60	12	19	6	3	M6	466025 0007	7,90
9	80	15	25	8	4	M8	466025 0009	8,-
11	100	20	31	10	5	M10	466025 0011	9,50
14	125	25	38	12	6	M12 M14	466025 0014	10,70
18	160	30	48	15	8	M16 M18	466025 0018	15,20
22	200	40	52	15	10	M20 M22	466025 0022	23,-
26	200	40	66	20	10	M24	466025 0026	28,40
33	250	50	74	20	12	M30	466025 0034	49,10

4157

## Forked clamp with nose

Slot width mm	l1 mm	a mm	b2 mm	b3 mm	l2 mm	l3 mm	for screws	art.no.	€
9	100	15	30	16	32	18	M8	466030 0009	25,-
11	125	20	30	20	38	24	M10	466030 0011	31,70
14	160	25	40	24	47	30	M12 M14	466030 0014	25,20
18	200	30	50	28	57	36	M16 M18	466030 0018	33,60
22	250	40	60	35	68	45	M20 M22	466030 0022	61,10
26	315	40	70	43	83	56	M24	466030 0026	75,30
33	400	50	80	50	88	56	M30	466030 0034	147,50

4157

## Standard, offset, DIN 6316

Slot width mm	l mm	a mm	b2 mm	b3 mm	c mm	e1 mm	e2 mm	for screws	art.no.	€
6.6	60	10	20	10	8	22	20	M6	466040 0007	14,05
9	80	12	25	12	9	27.5	25	M8	466040 0009	14,95
11	100	15	30	15	12	36	32	M10	466040 0011	16,-
14	125	20	40	20	16	44	40	M12 M14	466040 0014	16,30
18	160	25	50	25	20	51.5	50	M16 M18	466040 0018	23,70
22	200	30	60	30	24	59	70	M20 M22	466040 0022	38,60
26	250	35*	70	35	25	76.5	80	M24	466040 0026	72,30
33	315	50	80	40	40	96	100	M30	466040 0033	164,-

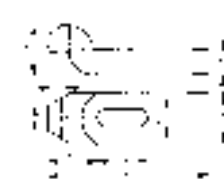
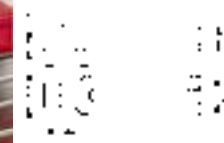
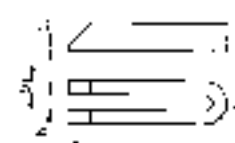
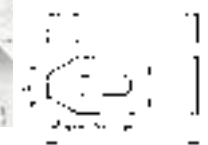
4157

## With stepped teeth

- Compatible with universal clamping supports 466047 0001-0002-0003
- The long version is designed for large spans due to wide slot spacing or greater workpiece clamping depths, e.g. on engraving machines.

Slot width mm	l mm	a mm	b2 mm	b3 mm	e1 mm	e2 mm	for screws	art.no.	€
6.6	50	10	20	8	10	20	M6	466046 0007	10,40
9	60	12	25	10	13	22	M8	466046 0009	12,75
11	80	15	30	12	15	30	M10	466046 0011	16,10
14	100	20	40	14	21	40	M12 M14	466046 0014	16,20
18	125	25	50	18	26	45	M16 M18	466046 0018	23,30
22	160	30	60	22	30	60	M20 M22	466046 0022	37,30
26	200	30	70	26	35	80	M24	466046 0026	59,-

4157

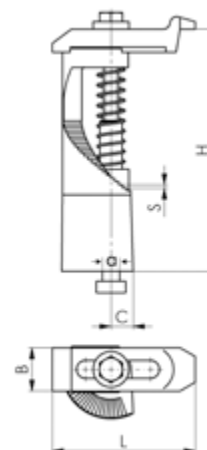


## AMF Helical clamp

- Special cast iron
- Screw and threaded sleeve strength class 8.8
- Quick to use as a clamping unit
- Finely graded steps allow rapid adjustment for any workpiece height up to approx. 320 mm
- Requires little space on the work table thanks to the compact design

Model	a mm	H mm	S mm	C mm	L mm	B mm	art.no.	€
0	12	0 - 45	0.75	14	140	34	<b>466044 1200</b>	<b>118,50</b>
1	12	15 - 45	0.75	14	110	34	466044 1201	121,-
2	12	30 - 75	1.25	15	112	34	466044 1202	140,50
3	12	60 - 135	2.5	16	112	34	466044 1203	179,-
4	12	120 - 195	2.5	18	112	34	466044 1204	238,-
5	12	180 - 255	2.5	19	112	34	466044 1205	273,-
0	14	0 - 45	0.75	14	140	34	466044 1400	122,-
1	14	15 - 45	0.75	14	112	34	466044 1401	122,50
2	14	30 - 75	1.25	15	112	34	466044 1402	144,50
3	14	60 - 135	2.5	16	112	34	466044 1403	184,-
4	14	120 - 195	2.5	18	112	34	466044 1404	246,-
5	14	180 - 255	2.5	19	112	34	466044 1405	277,-
0	16	0 - 70	1.25	20	160	50	466044 1600	193,-
1	16	25 - 70	1.25	20	125	50	466044 1601	194,-
2	16	50 - 120	2.5	21	125	50	466044 1602	235,-
3	16	100 - 220	3.75	21	125	50	466044 1603	311,-
4	16	200 - 320	3.75	24	125	50	466044 1604	425,-
0	18	0 - 70	1.25	20	160	50	466044 1800	204,-
1	18	25 - 70	1.25	20	125	50	466044 1801	205,-
2	18	50 - 120	2.5	21	125	50	466044 1802	250,-
3	18	100 - 220	3.75	21	125	50	466044 1803	324,-
4	18	200 - 320	3.75	24	125	50	466044 1804	435,-

4157



## AMF Clamping claw

- **Infinitely variable**
- Forged steel, hardened and tempered, galvanised
- Complete with DIN 787 T-slot screws, nuts and washers
- For quickly bridging various clamping heights with no additional supports
- Requires little space on the work table
- Designed for maximum loads
- Particularly suitable as a clamping device for cutting and stamping tools



T-groove dimension DIN 787	Clamping height mm	T-groove screw DIN 787	Clamps L x W mm	art.no.	€
12	0 - 50	12 M12 x 125	140 x 50	<b>466001 0012</b>	<b>51,40</b>
14	0 - 50	14 M12 x 125	140 x 50	466001 0014	52,40
16	0 - 75	16 M16 x 160	140 x 50	466001 0016	56,50
18	0 - 75	18 M16 x 160	140 x 50	466001 0018	56,50
20	0 - 85	20 M20 x 200	175 x 60	466001 0020	76,80
22	0 - 85	22 M20 x 200	175 x 60	466001 0022	78,40

4157

Over 200,000 tools available online!

Register online now!

[www.saratools.com](http://www.saratools.com)

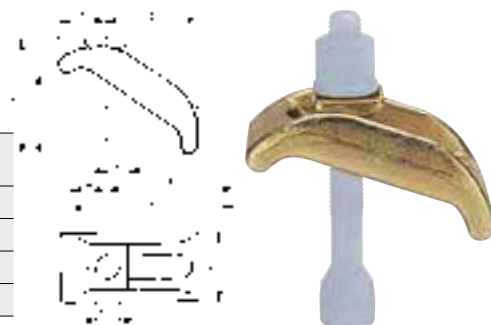


## AMF Clamping claw, short

- **Without clamping screw; with U-section**
- Infinitely variable
- Hardened and tempered, galvanised and blue passivated
- Supplied without T-slot screws or nuts

T-groove dimension DIN 787	T-groove screw DIN 787	L mm	b mm	b1 mm	c mm	d mm	e mm	f mm	h mm	k mm	m mm	art.no.	€
12/14	M12	88	38	13	28	48	23	68	0-35	14	30-55	<b>466002 0012</b>	<b>28,40</b>
16/18	M16	130	56	18	38	74	29	101	0-55	18	42-84	466002 0016	35,20
20/22	M20	140	66	22	46	80	32	112	0-65	20	50-100	466002 0020	45,60
24/28	M24	174	76	26	52	100	39	135	0-75	24	54-111	466002 0024	64,60

4157



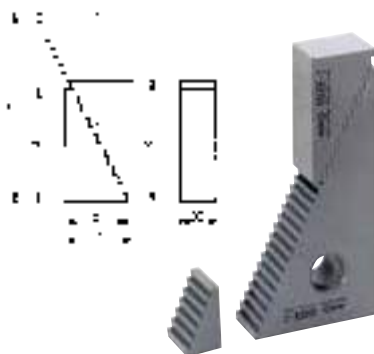
## AMF Universal clamping supports

- **Individual and as a set**
- Tempering steel, painted
- Can be used in pairs with all clamps and individually with the toothed clamps
- Vertical step height 4.65 mm, horizontal step height 2.3 mm

466047 0020

Model	h - H mm	a mm	b mm	c mm	art.no.	€
1	23 - 51	33	19	33	<b>466047 0001</b>	<b>4,48</b>
2	39 - 107	66	35.5	66	466047 0002	8,10
3	71 - 208	131	68	131	466047 0003	20,10
Set consisting of 8x Model 1, 8x Model 2, 4x Model 3	22 - 208				466047 0020	189,-

4157



## AMF Correcting wedge HERKULES

- **Height wedge**
- Centring hole  $\varnothing$  12 mm
- Ductile iron and steel hardened and tempered to a burnished shade, incl. ball attachment 466019 0001
- Correcting wedge can still be adjusted slightly at a load equal to one third of the maximum load capacity
- Precision-machined wedge surfaces enable smooth, sensitive adjustments ( $< 1/10$  mm) using either a knurled-head screw or hexagonal screwdriver
- Double wedge effect, produces considerable lift and precise vertical movement without lateral displacement
- Height wedge tried and tested with heavy cast iron or forged parts on large machine tools

h - H mm	A mm	B mm	L mm	Wr. width mm	H mm/rev	Load capacity kN	art.no.	€
50 - 63	40	40	63	13	0.86	40	<b>466050 0063</b>	<b>293,-</b>
100 - 125	60	115	125	24	1.16	100	466050 0125	629,-
170 - 190	80	145	175	36	2.02	250	466050 0190	1.649,-

4157



## AMF Clamping supports, toothed

- **(Serrated jacks)**
- Malleable cast iron, painted
- Step height 5.2 mm
- Plane-milled standing surface



Model	h - H mm	l mm	b mm	Load capacity kN	art.no.	€
3	155 - 223	60	60	60	<b>466049 0003</b>	<b>104,-</b>
4	220 - 340	80	80	90	466049 0004	188,-

4157



## AMF Screw jack

- With flat support
- Tempering steel, painted
- Spindle: Trapezoidal thread, self-locking, with end stop body

Centre hole Ø mm	Head Ø mm	Load capacity kN	Base body Ø mm	Support surface height mm	art.no.	€
12	31	25	31	38 - 50	<b>466015 3150</b>	<b>28,10</b>
12	50	100	50	42 - 52	466015 5052	37,40
12	50	100	50	50 - 70	466015 5070	39,90
12	50	100	50	70 - 100	466015 5010	45,50
12	68	120	68	100 - 140	466015 7014	80,40
12	80	170	70	140 - 210	466015 7021	145,50
12	100	350	80	190 - 300	466015 8010	265,-

4157



## AMF Aluminium screw jack

- With chip guard
- Wiper protects the vice thread against the ingress of swarf
- Centring hole Ø 12 mm
- Spindle made from tempering steel, burnished
- Trapezoidal thread, self-locking, with end stop body

Description	Head Ø mm	Base body Ø mm	Load capacity kN	Support surface height mm	art.no.	€
Screw jack with aluminium foot	50	50	30	75 - 88	<b>466016 0001</b>	<b>107,-</b>
Screw jack with magnetic foot	50	50	30	75 - 88	466016 0002	133,50

4157



### Aluminium spacer rings

- For subsequent height extension

	h mm	art.no.	€
	12.5	<b>466016 0125</b>	<b>13,45</b>
	25	466016 0250	18,45
	50	466016 0500	32,60

4157



466016 0125

466016 0250

466016 0500

## AMF Screw jack ATLAS

- With locking nut
- Centring hole Ø 12 mm
- Spindle, complete Tempering steel, with trapezoidal thread
- Spindle head, burnished
- Grey cast iron base body, painted

h - H mm	a mm	Load capacity kN	d mm	art.no.	€
100 - 140	18	60	46	<b>466017 0140</b>	<b>86,50</b>
140 - 200	18	60	46	466017 0200	108,50
200 - 320	22	40	46	466017 0320	151,50
320 - 550	22	25	46	466017 0550	176,-

4157



## AMF Height-adjustable threaded pedestal

- With DIN 6325 cylindrical pins, 12 x 50 and 12 x 80 (1 of each)
- Centring hole Ø 12 mm
- Tempering steel, burnished
- Spindle: metric fine thread, M30 x 1.5, with end stop body
- Sliding insert runs on pressed-in plain bearing bush

h - H mm	with straight shank 12 x 50 mm	with straight shank 12 x 80 mm	d mm	D1 mm	D mm	Load capacity kN	A mm	art.no.	€
55 - 75	83 - 103	113 - 133	12	50	36	30	25	<b>466050 0075</b>	<b>121,50</b>
75 - 115	103 - 143	133 - 173	12	50	36	30	45	466050 0115	126,50

4157



## AMF Screw jack, heavy-duty

- **Heavy-duty design, with brass locking screw**
- Centring hole  $\varnothing$  12 mm
- Spindle, complete Tempering steel, with trapezoidal thread
- Spindle head, burnished
- Base body made from tempering steel, painted

h - H mm	a mm	d mm	Load capacity kN	art.no.	€
200 - 300	26	65	80	<b>466018 0300</b>	<b>283,-</b>
290 - 470	26	65	60	466018 0460	342,-
430 - 750	26	65	50	466018 0750	435,-
710 - 1250	26	65	40	466018 1250	579,-

4157

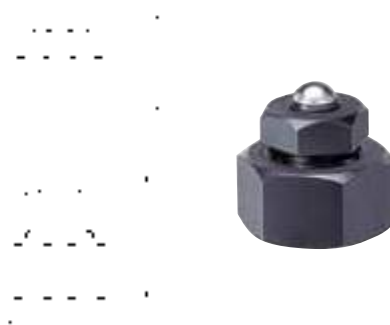


## AMF Threaded pedestal

- **With rotatable ball**
- Steel hardened and tempered to a burnished shade
- Hardened ball
- Punctiform support, particularly suitable for supporting and aligning free-formed surfaces such as cast iron and forged workpieces
- Calibration accuracy approx. 0.1 mm

h - H mm	Load capacity kN	art.no.	€
56 - 70	30	<b>466050 0070</b>	<b>50,90</b>

4157



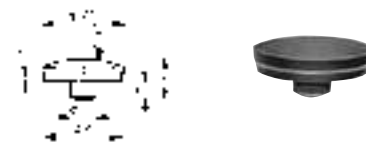
## AMF Attachments

- **For alignment and support elements**
- Steel hardened and tempered to a burnished shade

### Ball attachment

$\varnothing$ mm	art.no.	€
37	<b>466019 0001</b>	<b>9,50</b>

4157



### V-block attachment

A mm	B mm	C mm	D min. mm	E mm	max. $\varnothing$ mm	art.no.	€
32	45	23	10	42	50	<b>466019 0010</b>	<b>23,70</b>
56	65	38	22	62	100	466019 0011	44,20

4157



### Centring plate

Description	art.no.	€
For mounting $\varnothing$ 50 mm screw jacks	<b>466019 0020</b>	<b>13,85</b>

4157



### Fixing attachment

- For forked clamps

D mm	d mm	L mm	l mm	art.no.	€
63	14	40	12	<b>466019 0030</b>	<b>34,20</b>
78	25	53	15	466019 0031	40,40

4157



### Attachment with rotatable ball

- Hardened ball

Load capacity kN	art.no.	€
30	<b>466019 0040</b>	<b>34,10</b>

4157





## AMF Washers

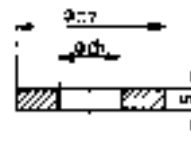
DIN  
6340DIN  
6319DDIN  
6319CDIN  
6319G

## Standard version, DIN 6340

- Hardened and tempered (350 + 80 Hv 30)
- \* = DIN-compliant dimensions, but stamped and pressed flat

for thread	d1 mm	d2 mm	s mm	art.no.	€
M6	6.4	17	3	466525 0006	0,69
M8	8.4	23	4	466525 0008	0,73
M10	10.5	28	4	466525 0010	0,77
M12	13	35	5	466525 0012	0,90
M14*	15	40	5	466525 0014	1,04
M16	17	45	6	466525 0016	1,27
M18*	19	45	6	466525 0018	1,61

4158



for thread	d1 mm	d2 mm	s mm	art.no.	€
M20	21	50	6	466525 0020	2,02
M22*	23	50	8	466525 0022	2,43
M24	25	60	8	466525 0024	3,04
M27*	28	68	10	466525 0027	5,15
M30	31	68	10	466525 0030	5,20
M36*	38	80	10	466525 0036	8,75

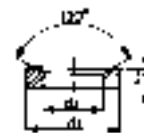
4158

## Spherical washer, DIN 6319 D

- Case-hardened and phosphate-treated, suitable for screw strengths equivalent to class 8.8
- For use only **with flat closed ring surfaces**
- (not permissible for longitudinal slots - for this purpose, we recommend DIN 6319G)

for thread	max. transferable static bolt force kN	d2 mm	d4 mm	h3 mm	art.no.	€
M6	9	7.1	12	2.8	466530 0006	0,59
M8	17	9.6	17	3.5	466530 0008	0,62
M10	26	12	21	4.2	466530 0010	0,79
M12	38	14.2	24	5	466530 0012	0,89
M14	53	16.5	28	5.6	466530 0014	1,61

4158



for thread	max. transferable static bolt force kN	d2 mm	d4 mm	h3 mm	art.no.	€
M16	73	19	30	6.2	466530 0016	1,71
M20	117	23.2	36	7.5	466530 0020	2,65
M24	168	28	44	9.5	466530 0024	4,36
M30	269	35	56	12	466530 0030	7,75
M36	394	42	68	15	466530 0036	17,30

4158

## Spherical washer, DIN 6319 C

- Case-hardened and phosphate-treated

for thread	d1 mm	d3 mm	h2 mm	r mm	art.no.	€
M6	6.4	12	2.3	9	466535 0006	0,51
M8	8.4	17	3.2	12	466535 0008	0,59
M10	10.5	21	4	15	466535 0010	0,79
M12	13	24	4.6	17	466535 0012	0,90
M14	15	28	5	22	466535 0014	1,41

4158



for thread	d1 mm	d3 mm	h2 mm	r mm	art.no.	€
M16	17	30	5.3	22	466535 0016	1,53
M20	21	36	6.3	27	466535 0020	2,18
M24	25	44	8.2	32	466535 0024	3,52
M30	31	56	11.2	41	466535 0030	6,80
M36	37	68	14	50	466535 0036	16,20

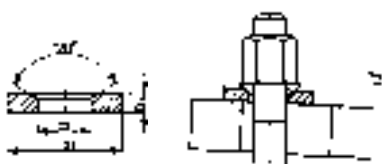
4158

## Spherical washer, DIN 6319 G

- Stamped, pressed, hardened and tempered
- Particularly suitable for use with clamp slots
- Enables the respective clamping bolt to swivel out by 3°
- \* = deviates from DIN

for thread	d2 mm	d5 mm	h4 mm	art.no.	€
M6	7.1	17	4	466540 0006	1,43
M8	9.6	24	5	466540 0008	1,43
M10	12	30	5	466540 0010	1,43
M12	14.2	36*	6	466540 0012	1,67
M14	16.5	40	6	466540 0014	2,55

4158



for thread	d2 mm	d5 mm	h4 mm	art.no.	€
M16	19	44*	7	466540 0016	2,55
M20	23.2	50	8	466540 0020	3,58
M24	28	60	10	466540 0024	6,10
M30	35	68	10*	466540 0030	9,90
M36	42	80	12	466540 0036	20,80

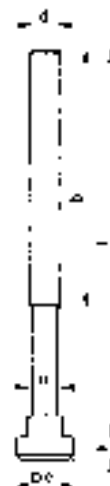
4158



## AMF Screws for T-slots

DIN  
787

- Complete with nut and washer
- Forged, with milled T-slot guide and rolled thread
- M6 - M12 hardened and tempered to strength class 10.9
- M14 - M42 hardened and tempered to strength class 8.8
- Further sizes available on request



Groove width mm	d mm	L mm	b mm	a mm	e mm	k mm	art.no.	€
6	M6	25	15	5.7	10	4	466501 0601	8,-
6	M6	40	28	5.7	10	4	466501 0602	8,15
8	M8	32	22	7.7	13	6	466501 0801	8,80
8	M8	50	35	7.7	13	6	466501 0802	9,20
8	M8	80	50	7.7	13	6	466501 0803	9,50
10	M10	40	30	9.7	15	6	466501 1001	9,15
10	M10	63	45	9.7	15	6	466501 1002	8,50
10	M10	80	50	9.7	15	6	466501 1012	8,75
10	M10	100	60	9.7	15	6	466501 1003	8,95
12	M12	50	35	11.7	18	7	466501 1201	9,20
12	M12	63	40	11.7	18	7	466501 1202	9,35
12	M12	80	55	11.7	18	7	466501 1203	9,60
12	M12	100	65	11.7	18	7	466501 1223	10,10
12	M12	125	75	11.7	18	7	466501 1204	10,40
12	M12	160	100	11.7	18	7	466501 1224	12,65
12	M12	200	120	11.7	18	7	466501 1205	12,45
14	M12	50	35	13.7	22	8	466501 1210	9,20
14	M12	63	45	13.7	22	8	466501 1211	9,45
14	M12	80	55	13.7	22	8	466501 1212	9,65
14	M12	100	65	13.7	22	8	466501 1222	10,30
14	M12	125	75	13.7	22	8	466501 1213	10,90
14	M12	160	100	13.7	22	8	466501 1233	11,90
14	M12	200	120	13.7	22	8	466501 1214	12,05
16	M14	63	45	15.7	25	9	466501 1401	10,90
16	M14	80	55	15.7	25	9	466501 1411	11,80
16	M14	100	65	15.7	25	9	466501 1402	12,25
16	M14	125	75	15.7	25	9	466501 1412	12,65
16	M14	160	100	15.7	25	9	466501 1403	13,15
16	M14	250	120	15.7	25	9	466501 1404	17,30
16	M16	63	45	15.7	25	9	466501 1601	12,15
16	M16	80	55	15.7	25	9	466501 1602	12,75
16	M16	100	65	15.7	25	9	466501 1603	13,05
16	M16	125	85	15.7	25	9	466501 1623	14,55
16	M16	160	100	15.7	25	9	466501 1604	15,20
16	M16	200	125	15.7	25	9	466501 1605	16,10
16	M16	250	150	15.7	25	9	466501 1606	18,35

4158

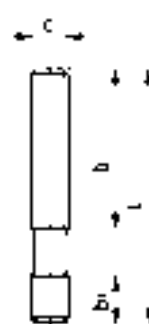
Groove width mm	d mm	L mm	b mm	a mm	e mm	k mm	art.no.	€
18	M16	63	45	17.7	28	10	466501 1610	12,55
18	M16	80	55	17.7	28	10	466501 1611	12,95
18	M16	100	65	17.7	28	10	466501 1612	13,35
18	M16	125	85	17.7	28	10	466501 1622	14,55
18	M16	160	100	17.7	28	10	466501 1613	15,40
18	M16	200	125	17.7	28	10	466501 1614	16,50
18	M16	250	150	17.7	28	10	466501 1615	18,75
20	M20	80	55	19.7	32	12	466501 2001	18,75
20	M20	100	65	19.7	32	12	466501 2021	19,25
20	M20	125	85	19.7	32	12	466501 2002	20,10
20	M20	160	110	19.7	32	12	466501 2003	21,10
20	M20	200	125	19.7	32	12	466501 2004	23,60
20	M20	250	150	19.7	32	12	466501 2006	26,80
20	M20	315	190	19.7	32	12	466501 2005	29,50
22	M20	80	55	21.7	35	14	466501 2010	18,85
22	M20	100	65	21.7	35	14	466501 2011	19,85
22	M20	125	85	21.7	35	14	466501 2012	20,40
22	M20	160	110	21.7	35	14	466501 2013	21,60
22	M20	200	125	21.7	35	14	466501 2014	23,90
22	M20	250	150	21.7	35	14	466501 2015	26,80
22	M20	315	190	21.7	35	14	466501 2016	30,10
24	M24	100	70	23.7	40	16	466501 2401	29,20
24	M24	125	85	23.7	40	16	466501 2402	30,30
24	M24	160	110	23.7	40	16	466501 2403	31,50
24	M24	200	125	23.7	40	16	466501 2404	33,70
24	M24	250	150	23.7	40	16	466501 2405	36,80
24	M24	315	190	23.7	40	16	466501 2425	45,20
24	M24	400	240	23.7	40	16	466501 2406	51,40
28	M24	100	70	27.7	44	18	466501 2410	29,30
28	M24	125	85	27.7	44	18	466501 2411	30,70
28	M24	160	110	27.7	44	18	466501 2412	32,60
28	M24	200	125	27.7	44	18	466501 2413	34,40
28	M24	250	150	27.7	44	18	466501 2414	38,30
28	M24	315	190	27.7	44	18	466501 2424	45,70
28	M24	400	240	27.7	44	18	466501 2415	51,90

4158

## AMF Studs

DIN  
6379

- Rolled thread
- M6 - M12 hardened and tempered to strength class 10.9
- M14 - M42 hardened and tempered to strength class 8.8
- Further sizes available on request



d mm	L mm	b mm	b1 mm	art.no.	€
M6	32	16	9	466505 0632	0,77
M6	40	20	9	466505 0640	0,90
M6	50	30	9	466505 0650	0,97
M6	63	40	9	466505 0663	1,08
M6	80	50	9	466505 0680	1,14
M8	40	20	11	466505 0840	1,43
M8	63	40	11	466505 0863	1,51
M8	80	50	11	466505 0880	1,67
M8	100	63	11	466505 0810	1,73
M8	125	75	11	466505 0812	4,48
M8	160	100	11	466505 0816	4,68
M10	50	25	13	466505 1050	1,59
M10	80	50	13	466505 1080	1,98
M10	100	75	13	466505 1010	2,10
M10	125	75	13	466505 1012	2,38
M10	160	100	13	466505 1016	2,89
M10	200	122	13	466505 1020	3,24
M12	50	25	15	466505 1250	1,75
M12	63	32	15	466505 1263	1,98
M12	80	50	15	466505 1280	2,02
M12	100	63	15	466505 1210	2,18
M12	125	75	15	466505 1212	2,73
M12	160	100	15	466505 1216	3,08
M12	200	122	15	466505 1220	3,30
M14	63	32	17	466505 1463	2,36
M14	80	50	17	466505 1480	2,91
M14	100	63	17	466505 1410	2,95
M14	125	75	17	466505 1412	3,36
M14	160	100	17	466505 1416	3,54
M14	200	122	17	466505 1420	4,42
M14	250	160	17	466505 1425	5,50
M16	63	32	19	466505 1663	2,97
M16	80	50	19	466505 1680	3,08
M16	100	63	19	466505 1610	3,18
M16	125	75	19	466505 1612	3,56
M16	160	100	19	466505 1616	4,56
M16	200	122	19	466505 1620	5,60

4158

d mm	L mm	b mm	b1 mm	art.no.	€
M16	250	160	19	466505 1625	6,30
M16	315	180	19	466505 1631	8,05
M16	500	315	19	466505 1650	14,35
M18	80	50	23	466505 1880	5,60
M18	125	75	23	466505 1812	6,70
M18	160	100	23	466505 1816	6,75
M18	200	122	23	466505 1820	8,50
M18	250	150	23	466505 1825	11,-
M18	315	180	23	466505 1831	13,15
M20	80	32	27	466505 2080	4,78
M20	125	70	27	466505 2012	6,15
M20	160	100	27	466505 2016	7,45
M20	200	122	27	466505 2020	8,50
M20	250	160	27	466505 2025	10,30
M20	315	200	27	466505 2031	12,55
M20	400	250	27	466505 2040	16,50
M20	500	315	27	466505 2050	18,85
M22	100	45	31	466505 2210	9,90
M22	160	100	31	466505 2216	9,95
M22	200	122	31	466505 2220	12,05
M22	250	160	31	466505 2225	14,85
M22	315	180	31	466505 2231	19,15
M22	400	250	31	466505 2240	19,25
M24	100	45	35	466505 2410	8,15
M24	125	70	35	466505 2412	8,65
M24	160	100	35	466505 2416	9,55
M24	200	122	35	466505 2420	11,50
M24	250	160	35	466505 2425	13,65
M24	315	200	35	466505 2431	16,30
M24	400	250	35	466505 2440	20,30
M24	500	315	35	466505 2450	26,80
M24	630	315	35	466505 2463	35,20
M27	125	56	39	466505 2712	23,50
M27	200	122	39	466505 2720	23,60
M27	315	200	39	466505 2731	26,70
M27	400	250	39	466505 2740	33,70
M27	500	315	39	466505 2750	41,20

4158

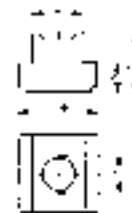
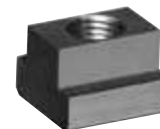
## AMF T-slot nuts

- Hardened and tempered, strength class 10
- The full load capacity for T-slot nuts can only be achieved if the screw connection uses the entire thread length

### Standard version, DIN 508

T-slot nominal dimension mm	Thread	a mm	e mm	h mm	k mm	art.no.	€
6	M5	5.7	10	8	4	466545 0006	2,41
8	M6	7.7	13	10	6	466545 0008	1,94
10	M8	9.7	15	12	6	466545 0010	2,04
12	M8	11.7	18	14	7	466545 1208	3,04
12	M10	11.7	18	14	7	466545 0012	2,04
14	M10	13.7	22	16	8	466545 1410	3,34
14	M12	13.7	22	16	8	466545 0014	2,41
16	M10	15.7	25	18	9	466545 1610	4,87
16	M12	15.7	25	18	9	466545 1612	3,99
16	M14	15.7	25	18	9	466545 0016	3,14
18	M12	17.7	28	20	10	466545 1812	5,15
18	M14	17.7	28	20	10	466545 1814	4,40
18	M16	17.7	28	20	10	466545 0018	3,77
20	M16	19.7	32	24	12	466545 2016	6,10
20	M18	19.7	32	24	12	466545 0020	5,70
22	M18	21.7	35	28	14	466545 2218	8,30
22	M20	21.7	35	28	14	466545 0022	6,30
24	M20	23.7	40	32	16	466545 2420	11,70
24	M22	23.7	40	32	16	466545 0024	11,10
28	M20	27.7	44	36	18	466545 2820	16,-
28	M22	27.7	44	36	18	466545 2822	19,55
28	M24	27.7	44	36	18	466545 0028	11,70
30	M24	29.7	48	38	19	466545 3024	28,70
32	M27	31.6	50	40	20	466545 0032	29,10
36	M24	35.6	54	44	22	466545 3624	26,20
36	M30	35.6	54	44	22	466545 0036	24,90
42	M30	41.6	65	52	26	466545 4230	52,40
42	M36	41.6	65	52	26	466545 0042	50,90
48	M42	47.6	75	60	30	466545 0048	98,70

4158

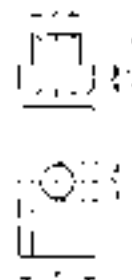


### Long

- Protects the table slots on precision machinery

T-slot nominal dimension mm	Thread	a mm	e mm	l mm	h mm	k mm	art.no.	€
6	M5	5.7	10	20	8	4	466547 0006	4,40
8	M6	7.7	13	26	10	6	466547 0008	4,44
10	M8	9.7	15	30	12	6	466547 0010	4,46
12	M10	11.7	18	36	14	7	466547 0012	4,64
14	M12	13.7	22	44	16	8	466547 0014	5,15
16	M14	15.7	25	50	18	9	466547 0016	6,55
18	M16	17.7	28	56	20	10	466547 0018	8,10
20	M18	19.7	32	64	24	12	466547 0020	11,70
22	M20	21.7	35	70	28	14	466547 0022	14,35
28	M24	27.7	44	88	36	18	466547 0028	26,70

4158



## AMF Rhombus T-slot nuts

- Hardened and tempered
- Lower load capacity than comparable DIN 508 sizes due to reduced contact surface in the T-slot

T-slot nominal dimension mm	Thread	Strength class	a mm	e mm	h mm	k mm	art.no.	€
12	M10	8	11.7	18	14	7	<b>466548 0012</b>	<b>5,45</b>
14	M10	8	13.7	22	16	8	466548 1410	<b>6,60</b>
14	M12	8	13.7	22	16	8	466548 0014	<b>6,60</b>
16	M14	6	15.7	25	18	9	466548 0016	<b>7,45</b>
18	M16	6	17.7	28	20	10	466548 0018	<b>7,65</b>
20	M16	8	19.7	32	24	12	466548 2016	<b>9,65</b>
20	M18	6	19.7	32	24	12	466548 0020	<b>10,15</b>
22	M20	6	21.7	35	28	14	466548 0022	<b>11,90</b>
28	M20	8	27.7	44	36	18	466548 2820	<b>19,95</b>
28	M24	6	27.7	44	36	18	466548 0028	<b>19,95</b>
36	M30	6	35.6	54	44	22	466548 0036	<b>38,60</b>
42	M36	6	41.6	65	52	26	466548 4236	<b>76,30</b>

4158

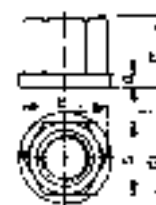
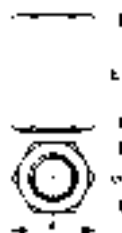
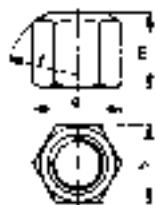


## AMF Hexagonal nuts

DIN 6330B

DIN 6334

DIN 6331



### 1.5 x D high, DIN6330B

- Hardened and tempered, strength class 10
- With spherical end, can be used directly with DIN 6319D or G conical washers
- With flat end, can be used with DIN 6340 hardened washers

Thread	Wr. width mm	e mm	m mm	r mm	art.no.	€
M6	10	11.05	9	9	<b>466510 0006</b>	<b>0,49</b>
M8	13	14.4	12	12	466510 0008	<b>0,49</b>
M10	16	17.8	15	15	466510 0110	<b>0,69</b>
M10	17	18.9	15	15	466510 0010	<b>0,69</b>
M12	18	20.03	18	17	466510 0112	<b>0,79</b>
M12	19	21.1	18	17	466510 0012	<b>0,79</b>
M14	21	23.4	21	20	466510 0114	<b>1,63</b>
M14	22	24.5	21	20	466510 0014	<b>1,69</b>
M16	24	26.8	24	22	466510 0016	<b>1,49</b>
M18	27	30.1	27	24	466510 0018	<b>2,79</b>
M20	30	33.5	30	27	466510 0020	<b>2,57</b>
M22	34	37.7	33	30	466510 0122	<b>4,26</b>
M22	32	35.7	33	30	466510 0022	<b>4,85</b>
M24	36	40	36	32	466510 0024	<b>4,15</b>
M27	41	45.6	40	36	466510 0027	<b>7,10</b>
M30	46	51.3	45	41	466510 0030	<b>10,40</b>
M36	55	61.3	54	50	466510 0036	<b>20,10</b>

4158

### 3 x D high, DIN6334

- Hardened and tempered, strength class 10
- Connecting element between DIN 787 (T-slot screw) and DIN 6379 (stud)
- **Not a screw-through version**
- Minimum screw-in length = 1xD

Thread	Wr. width mm	e mm	m mm	art.no.	€
M6	10	11.05	18	<b>466515 0006</b>	<b>1,65</b>
M8	13	14.4	24	466515 0008	<b>1,67</b>
M10	16	17.8	30	466515 0110	<b>1,98</b>
M10	17	18.9	30	466515 0010	<b>1,98</b>
M12	18	20.03	36	466515 0112	<b>2,16</b>
M12	19	21.1	36	466515 0012	<b>2,16</b>
M14	21	23.4	42	466515 0114	<b>3,63</b>
M14	22	24.5	42	466515 0014	<b>3,63</b>
M16	24	26.8	48	466515 0016	<b>3,71</b>
M18	27	30.1	54	466515 0018	<b>5,80</b>
M20	30	33.5	60	466515 0020	<b>6,80</b>
M22	34	37.7	66	466515 0122	<b>9,90</b>
M22	32	35.7	66	466515 0022	<b>9,90</b>
M24	36	40	72	466515 0024	<b>11,10</b>
M27	41	45.6	81	466515 0027	<b>16,90</b>
M30	46	51.3	90	466515 0030	<b>22,30</b>
M36	55	61.3	108	466515 0036	<b>43,80</b>

4158

### 1.5 x D high, DIN 6331 with collar

- Hardened and tempered, strength class 10
- Turned and milled

Thread	Wr. width mm	e mm	m mm	a mm	d1 mm	art.no.	€
M6	10	11.05	9	3	14	<b>466520 0006</b>	<b>2,71</b>
M8	13	14.4	12	3.5	18	466520 0008	<b>2,73</b>
M10	16	17.8	15	4	22	466520 0110	<b>2,83</b>
M10	17	18.9	15	4	22	466520 0010	<b>2,83</b>
M12	18	20.03	18	4	25	466520 0112	<b>2,91</b>
M12	19	21.1	18	4	25	466520 0012	<b>2,91</b>
M14	21	23.4	21	4.5	28	466520 0114	<b>3,46</b>
M14	22	24.5	21	4.5	28	466520 0014	<b>3,46</b>
M16	24	26.8	24	5	31	466520 0016	<b>4,42</b>
M18	27	30.1	27	5	34	466520 0018	<b>5,95</b>
M20	30	33.5	30	6	37	466520 0020	<b>6,20</b>
M22	34	37.7	33	6	40	466520 0122	<b>8,95</b>
M22	32	35.7	33	6	40	466520 0022	<b>8,95</b>
M24	36	40	36	6	45	466520 0024	<b>10,30</b>
M27	41	45.6	40	8	50	466520 0027	<b>22,80</b>
M30	46	51.3	45	8	58	466520 0030	<b>25,80</b>
M36	55	61.3	54	10	68	466520 0036	<b>38,20</b>

4158

## AMF Slot scraper

suitable for T-slots mm	art.no.	€
14 - 20	<b>466548</b> 1420	<b>4,44</b>
22 - 32	466548 2232	<b>8,65</b>

4157



## AMF Precision slot nuts

- For quickly aligning fixtures, machine vices and dividers
- Precisely ground to a high level of tolerance all round
- C15 case-hardened and ground



### Loose slot nuts, DIN 6323

- For calibration
- No slot nuts protruding from below when the fixture is moved

Groove dimensions machine mm	Groove dimensions device mm	h mm	h1 mm	l mm	art.no.	€
10	12	12	3.6	20	<b>466550</b> 1012	<b>22,80</b>
12	12	28.6	5.5	20	466550 1212	<b>19,25</b>
12	20	14	5.5	32	466550 1420	<b>33,20</b>
14	20	14	5.5	32	466550 1620	<b>33,60</b>
16	20	14	5.5	32	466550 1820	<b>33,60</b>
18	20	14	5.5	32	466550 2020	<b>30,40</b>
20	20	45.5	7	32	466550 2220	<b>48,-</b>
22	20	50.5	7	40	466550 2420	<b>52,40</b>
24	20	55.5	7	40	466550 2820	<b>57,50</b>
28	20	61.5	7	40	466550 3620	<b>74,80</b>
36	20	76.5	7	50		

4157

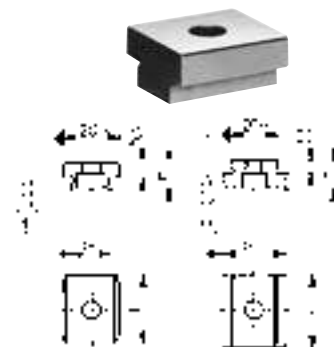


### Fixed slot nuts (previously DIN 6322)

- Screw-in
- Changing slot nuts makes it possible to work on machines with different slot widths

Groove dimensions machine mm	Groove dimensions device mm	h mm	l mm	for DIN 84 or DIN 912 screws	art.no.	€
10	20	10	22	M6 x 10	<b>466551</b> 1020	<b>26,90</b>
12	20	10	22	M6 x 10	466551 1220	<b>26,90</b>
14	20	10	25	M6 x 16	466551 1420	<b>26,90</b>
16	20	10	25	M6 x 16	466551 1620	<b>26,90</b>
18	20	10	25	M6 x 16	466551 1820	<b>26,90</b>
22	20	12	32	M6 x 16	466551 2220	<b>31,-</b>
24	20	12	32	M6 x 16	466551 2420	<b>34,90</b>
28	20	12	32	M6 x 16	466551 2820	<b>35,70</b>
36	20	12	32	M6 x 16	466551 3620	<b>38,50</b>

4157

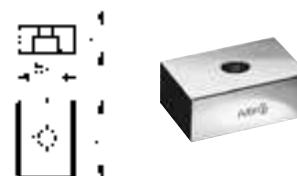


### Flat slot nuts

- Screw-in
- Effective and economical if a fixture will always be used on the same machine

b mm	h mm	l mm	art.no.	€
10	8	20	<b>466552</b> 0010	<b>7,85</b>
12	8	20	466552 0012	<b>7,85</b>
14	10	22	466552 0014	<b>8,40</b>
16	10	22	466552 0016	<b>8,40</b>
18	10	22	466552 0018	<b>8,85</b>
20	10	22	466552 0020	<b>9,20</b>
22	12	32	466552 0022	<b>12,45</b>
24	12	32	466552 0024	<b>12,45</b>

4157

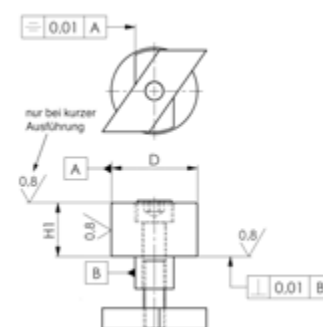


## AMF Stop

- Case-hardened and ground
- Short model, ground to  $\pm 0.01$  mm height tolerance
- Can also be used as a support

for T-slot mm	D mm	H1 mm	Screw	art.no.	€
12	20	15 $\pm$ 0.01	M6 x 25	<b>465015 1215</b>	<b>67,70</b>
12	20	25 $\pm$ 0.2	M6 x 35	465015 1220	<b>72,80</b>
14	32	25 $\pm$ 0.01	M8 x 35	465015 1425	<b>84,50</b>
14	32	50 $\pm$ 0.2	M8 x 60	465015 1450	<b>89,50</b>
16	32	25 $\pm$ 0.01	M8 x 45	465015 1625	<b>89,50</b>
16	32	50 $\pm$ 0.2	M8 x 70	465015 1650	<b>93,10</b>
18	40	25 $\pm$ 0.01	M10 x 50	465015 1825	<b>120,50</b>
18	40	50 $\pm$ 0.2	M10 x 75	465015 1850	<b>126,-</b>
20	40	25 $\pm$ 0.01	M10 x 55	465015 2225	<b>120,50</b>
20	40	50 $\pm$ 0.2	M10 x 80	465015 2250	<b>126,-</b>

4157

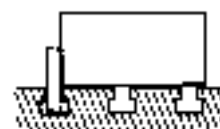
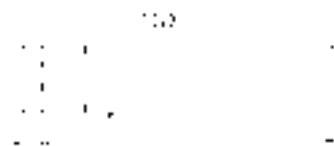


## AMF Parallel stop pair

- **For machine slots**
- Case-hardened and height ground in pairs to pair tolerance IT5
- Can also be used as parallel supports
- Height pair tolerance IT5
- Nominal dimension tolerance to the extent of DIN ISO 2768m
- Nominal dimension tolerance, width: h7
- Remaining dimensions in accordance with DIN ISO 2768m
- Prices per pair

b mm	h mm	Pair tolerance tp mm	Nominal dimension tolerance DIN 7168 m (mm)	Tolerance h7 mm	l mm	art.no.	€
8	25	0.009	$\pm$ 0.2	-0.02	100	<b>465010 0008</b>	<b>117,-</b>
10	32	0.011	$\pm$ 0.3	-0.02	100	465010 0010	<b>125,50</b>
12	40	0.011	$\pm$ 0.3	-0.02	100	465010 0012	<b>145,-</b>
14	50	0.011	$\pm$ 0.3	-0.02	100	465010 0014	<b>162,50</b>
16	50	0.011	$\pm$ 0.3	-0.02	160	465010 0016	<b>174,-</b>
18	63	0.013	$\pm$ 0.3	-0.02	160	465010 0018	<b>205,-</b>
20	63	0.013	$\pm$ 0.3	-0.02	160	465010 0020	<b>245,-</b>
22	80	0.013	$\pm$ 0.3	-0.02	160	465010 0022	<b>321,-</b>
24	80	0.013	$\pm$ 0.3	-0.02	160	465010 0024	<b>340,-</b>
28	100	0.015	$\pm$ 0.3	-0.02	160	465010 0028	<b>390,-</b>

4157



## AMF T-slot cover strip

- Made from aluminium profile
- Can easily be shortened to the desired length with a fine sawblade

suitable for T-slots mm	Dimensions mm	art.no.	€
12	12 x 1000	<b>466549 0120</b>	<b>25,90</b>
14	14 x 1000	466549 0140	<b>27,60</b>
16	16 x 1000	466549 0160	<b>29,50</b>
18	18 x 1000	466549 0180	<b>30,80</b>
20	20 x 1000	466549 0200	<b>32,90</b>
22	22 x 1000	466549 0220	<b>34,10</b>
24	24 x 1000	466549 0240	<b>37,40</b>
28	28 x 1000	466549 0280	<b>40,80</b>
36	36 x 1000	466549 0360	<b>48,-</b>

4157



## AMF Boxed clamping tool set

- Designed for machine tools with T-slot tables
- All the necessary elements for quickly clamping tools, fixtures or workpieces
- All parts are replaceable and extensible
- Tempering steel in accordance with DIN or company standards
- Screw parts strength class 8 or 10
- Wooden box with removable hinged lid



### M10 x 10 set with deep clamping jaws, slot width 10 mm

Description	art.no.	€
4 universal clamping supports Model 1		
4 universal clamping supports Model 2		
2 universal clamping supports Model 3		
4 clamps with stepped teeth 11 x 80		
2 DIN 787 T-slot screws M10 x 40		
4 DIN 787 T-slot screws M10 x 63		
4 DIN 787 T-slot screws M10 x 100		
4 DIN 6379 studs M10 x 80		
6 DIN 6330 B hexagonal nuts M10		
6 DIN 6319 G conical washers M10		
4 extension nuts M10		
4 „Bulle“ deep clamping jaws slot width 12		
1 No. 3113 A combination spanner 16 x 16		
1 screw paste 75 ml		
	<b>466590 1010</b>	<b>529,-</b>
	4158	

### M12 x 12 set with deep clamping jaws, slot width 12 mm

Description	art.no.	€
4 universal clamping supports Model 2		
4 universal clamping supports Model 3		
4 clamps with stepped teeth 14 x 100		
2 DIN 787 T-slot screws M12 x 50		
4 DIN 787 T-slot screws M12 x 100		
4 DIN 787 T-slot screws M12 x 125		
4 DIN 6379 studs M12 x 100		
6 DIN 6330 B hexagonal nuts M12		
6 DIN 6319 G conical washers M12		
4 extension nuts M12		
4 „Bulle“ deep clamping jaws slot width 12		
1 No. 3113 A combination spanner 18 x 18		
1 screw paste 75 ml		
	<b>466590 1212</b>	<b>599,-</b>
	4158	

### M12 x 14 set with deep clamping jaws, slot width 14 mm

Description	art.no.	€
4 universal clamping supports Model 2		
4 universal clamping supports Model 3		
4 clamps with stepped teeth 14 x 100		
2 DIN 787 T-slot screws M12 x 50		
4 DIN 787 T-slot screws M12 x 80		
4 DIN 787 T-slot screws M12 x 125		
4 DIN 6379 studs M12 x 100		
6 DIN 6330 B hexagonal nuts M12		
6 DIN 6319 G conical washers M12		
4 extension nuts M12		
4 „Bulle“ deep clamping jaws slot width 14		
1 slot scraper for slot widths 14-20		
1 No. 3113 A combination spanner 18 x 18		
1 screw paste 75 ml		
	<b>466590 1214</b>	<b>619,-</b>
	4158	

### M16 x 16 set with deep clamping jaws, slot width 16 mm

Description	art.no.	€
4 universal clamping supports Model 2		
4 universal clamping supports Model 3		
4 clamps with stepped teeth 18 x 125		
2 DIN 787 T-slot screws M16 x 63		
4 DIN 787 T-slot screws M16 x 100		
4 DIN 787 T-slot screws M16 x 160		
4 DIN 6379 studs M16 x 125		
6 DIN 6330 B hexagonal nuts M16		
6 DIN 6319 G conical washers M16		
4 extension nuts M16		
4 „Bulle“ deep clamping jaws slot width 16		
1 slot scraper for slot widths 14-20		
1 No. 3113 A combination spanner 24 x 24		
1 screw paste 75 ml		
	<b>466590 1616</b>	<b>809,-</b>
	4158	

### M16 x 18 set with deep clamping jaws, slot width 18 mm

Description	art.no.	€
4 universal clamping supports Model 2		
4 universal clamping supports Model 3		
4 clamps with stepped teeth 18 x 125		
2 DIN 787 T-slot screws M16 x 63		
4 DIN 787 T-slot screws M16 x 100		
4 DIN 787 T-slot screws M16 x 160		
4 DIN 6379 studs M16 x 125		
6 DIN 6330 B hexagonal nuts M16		
6 DIN 6319 G conical washers M16		
4 extension nuts M16		
4 „Bulle“ deep clamping jaws slot width 18		
1 slot scraper for slot widths 14-20		
1x No. 3113 A combination spanner 24 x 24		
1 screw paste 75 ml		
	<b>466590 1618</b>	<b>819,-</b>
	4158	

### M20 x 20 set with spring type clamp holder, slot width 20 mm

Description	art.no.	€
4 universal clamping supports Model 2		
4 universal clamping supports Model 3		
4 clamps with stepped teeth 22 x 160		
4 DIN 787 T-slot screws M20 x 125		
4 DIN 787 T-slot screws M20 x 200		
4 DIN 6379 studs M20 x 125		
6 DIN 6330 B hexagonal nuts M20		
6 DIN 6319 G conical washers M20		
4 extension nuts M20		
1 slot scraper for slot widths 14-20		
1 No. 3113 A combination spanner 30 x 30		
4 DIN 6342 spring-type clamp holders Ø 38		
1 screw paste 75 ml		
	<b>466590 2020</b>	<b>799,-</b>
	4158	

### M20 x 22 set with spring type clamp holder, slot width 22 mm

Description	art.no.	€
4 universal clamping supports Model 2		
4 universal clamping supports Model 3		
4 clamps with stepped teeth 22 x 160		
4 DIN 787 T-slot screws M20 x 125		
4 DIN 787 T-slot screws M20 x 200		
4 DIN 6379 studs M20 x 125		
6 DIN 6330 B hexagonal nuts M20		
6 DIN 6319 G conical washers M20		
4 extension nuts M20		
1 slot scraper for slot widths 22-32		
1x No. 3113 A combination spanner 30 x 30		
4 DIN 6342 spring-type clamp holders Ø 38		
1 screw paste 75 ml		
	<b>466590 2022</b>	<b>809,-</b>
	4158	

### M20 x 24 set with spring type clamp holder, slot width 24 mm

Description	art.no.	€
4 universal clamping supports Model 2		
4 universal clamping supports Model 3		
4 clamps with stepped teeth 22 x 160		
8 DIN 787 T-slot screws M20 x 125		
4 DIN 787 T-slot screws M20 x 200		
8 DIN 508 T-slot nuts M20 x 24		
6 DIN 6330 B hexagonal nuts M20		
6 DIN 6319 G conical washers M20		
4 extension nuts M20		
1 slot scraper for slot widths 22-32		
1 No. 3113 A combination spanner 30 x 30		
4 DIN 6342 spring-type clamp holders Ø 38		
1 screw paste 75 ml		
	<b>466590 2024</b>	<b>809,-</b>
	4158	



## AMF Clamping screw set

- For T-slots
- All parts hardened and tempered, strength classes 8 or 10
- Wooden box with hinged lid

### M10 x 10 set, slot width 10 mm

Description	art.no.	€	
2 DIN 787 T-slot screws M10 x 40	<b>466591 1010</b>	<b>167,50</b>	
4 DIN 787 T-slot screws M10 x 80			
4 DIN 787 T-slot screws M10 x 100			
4 DIN 6379 studs M10 x 50			
4 DIN 6379 studs M10 x 80			
4 DIN 6379 studs M10 x 200			
4 DIN 6330 B hexagonal nuts M10			
4 extension nuts M10			
4 DIN 6319 C spherical washers			
4 DIN 6319 G conical washers			
4 DIN 6340 washers			
			4158

### M12 x 12 set, slot width 12 mm

Description	art.no.	€	
2 DIN 787 T-slot screws M12 x 50	<b>466591 1212</b>	<b>188,-</b>	
4 DIN 787 T-slot screws M12 x 80			
4 DIN 787 T-slot screws M12 x 125			
4 DIN 6379 studs M12 x 63			
4 DIN 6379 studs M12 x 100			
4 DIN 6379 studs M12 x 200			
4 DIN 6330 B hexagonal nuts M12			
4 extension nuts M12			
4 DIN 6319 C spherical washers			
4 DIN 6319 G conical washers			
4 DIN 6340 washers			
			4158

### M14 x 16 set, slot width 16 mm

Description	art.no.	€	
2 DIN 787 T-slot screws M14 x 63	<b>466591 1416</b>	<b>227,-</b>	
4 DIN 787 T-slot screws M14 x 100			
4 DIN 6379 studs M14 x 63			
4 DIN 6379 studs M14 x 100			
4 DIN 6379 studs M14 x 160			
4 DIN 6379 studs M14 x 250			
4 DIN 508 T-slot nuts M14 x 16			
4 DIN 6330 B hexagonal nuts M14			
4 extension nuts M14			
4 DIN 6319 C spherical washers			
4 DIN 6319 G conical washers			
4 DIN 6340 washers			
			4158

### M16 x 18 set, slot width 18 mm

Description	art.no.	€	
2 DIN 787 T-slot screws M16 x 63	<b>466591 1618</b>	<b>259,-</b>	
4 DIN 787 T-slot screws M16 x 100			
4 DIN 6379 stud M16 x 80			
4 DIN 6379 stud M16 x 125			
4 DIN 6379 stud M16 x 160			
4 DIN 6379 stud M16 x 250			
4 DIN 508 T-slot nuts M16 x 18			
4 DIN 6330 B hexagonal nuts M16			
4 extension nuts M16			
4 DIN 6319 C spherical washers			
4 DIN 6319 G conical washers			
4 DIN 6340 washers			
			4158

### M20 x 22 set, slot width 22 mm

Description	art.no.	€	
2 DIN 787 T-slot screws M20 x 80	<b>466591 2022</b>	<b>395,-</b>	
4 DIN 787 T-slot screws M20 x 125			
4 DIN 6379 studs M20 x 80			
4 DIN 6379 studs M20 x 125			
4 DIN 6379 studs M20 x 200			
4 DIN 6379 studs M20 x 315			
4 DIN 508 T-slot nuts M20 x 22			
4 DIN 6330 B hexagonal nuts M20			
4 extension nuts M20			
4 DIN 6319 C spherical washers			
4 DIN 6319 G conical washers			
4 DIN 6340 washers			
			4158



466591 1214

### M12 x 14 set, slot width 14 mm

Description	art.no.	€	
2 DIN 787 T-slot screws M12 x 50	<b>466591 1214</b>	<b>189,-</b>	
4 DIN 787 T-slot screws M12 x 80			
4 DIN 6379 studs M12 x 63			
4 DIN 6379 studs M12 x 100			
4 DIN 6379 studs M12 x 125			
4 DIN 6379 studs M12 x 200			
4 DIN 508 T-slot nuts M12 x 14			
4 DIN 6330 B hexagonal nuts M12			
4x extension nuts M12			
4 DIN 6319 C spherical washers			
4 DIN 6319 G conical washers			
4 DIN 6340 washers			
			4158

### M16 x 16 set, slot width 16 mm

Description	art.no.	€	
2 DIN 787 T-slot screws M16 x 63	<b>466591 1616</b>	<b>258,-</b>	
4 DIN 787 T-slot screws M16 x 100			
2 DIN 787 T-slot screws M16 x 160			
4 DIN 6379 studs M16 x 80			
4 DIN 6379 studs M16 x 125			
4 DIN 6379 studs M16 x 250			
4 DIN 6330 B hexagonal nuts M16			
4 extension nuts M16			
4 DIN 6319 C spherical washers			
4 DIN 6319 G conical washers			
4 DIN 6340 washers			
			4158

### M18 x 20 set, slot width 20 mm

Description	art.no.	€	
6 DIN 6379 studs M18 x 80	<b>466591 1820</b>	<b>349,-</b>	
8 DIN 6379 studs M18 x 125			
4 DIN 6379 studs M18 x 200			
4 DIN 6379 studs M18 x 315			
4 DIN 508 T-slot nuts M18 x 20			
4 DIN 6330 B hexagonal nuts M18			
4 extension nuts M18			
4 DIN 6340 washers			
			4158

### M24 x 28 set, slot width 28 mm

Description	art.no.	€	
2 DIN 787 T-slot screws M24 x 100	<b>466591 2428</b>	<b>639,-</b>	
4 DIN 787 T-slot screws M24 x 160			
4 DIN 6379 studs M24 x 100			
4 DIN 6379 studs M24 x 160			
4 DIN 6379 studs M24 x 250			
4 DIN 6379 studs M24 x 400			
4 DIN 508 T-slot nuts M24 x 28			
4 DIN 6330 B hexagonal nuts M24			
4 extension nuts M24			
4 DIN 6319 C spherical washers			
4 DIN 6319 G conical washers			
4 DIN 6340 washers			
			4158

## AMF Basic range

- All parts are made from tempering steel, T-slot screws hardened and tempered
- Rolled thread
- Ideal for tool making, production and use in training facilities

### M12 x 14 set, slot width 14 mm

- Clamping force 20 kN
- Clamping heights 165 mm (2 clamping positions), 70 mm (4 clamping positions)

Description	art.no.	€
2 clamps with stepped teeth 14 x 100 2 clamps with stepped teeth 14 x 160 4 universal clamping supports Model 2 4 universal clamping supports Model 3 2 DIN 787 T-slot screws M12 x 50 4 DIN 787 T-slot screws M12 x 80 4 DIN 787 T-slot screws M12 x 125 2 DIN 6379 studs M12 x 100 6 DIN 6330 B hexagonal nuts M12 2 extension nuts M12 6 DIN 6340 washers M12	<b>466592 1214</b>	<b>291,-</b>

4158



466592 1214

### M14 x 16 set, slot width 16 mm

- Clamping force 28 kN
- Clamping heights 195 mm (2 clamping positions), 100 mm (4 clamping positions)

Description	art.no.	€
2 clamps with stepped teeth 14 x 100 2 clamps with stepped teeth 14 x 160 4 universal clamping supports Model 2 universal clamping support Model 3 2 DIN 787 T-slot screws M14 x 63 4 DIN 787 T-slot screws M14 x 100 4 DIN 787 T-slot screws M14 x 160 2 DIN 6379 studs M14 x 100 2 DIN 6379 studs M14 x 160 6 DIN 6330 B hexagonal nuts M14 2 extension nuts M14 6 DIN 6340 washers M14	<b>466592 1416</b>	<b>332,-</b>

4158

### M16 x 18 set, slot width 18 mm

- Clamping force 40 kN
- Clamping heights 205 mm (2 clamping positions), 130 mm (4 clamping positions)

Description	art.no.	€
2 clamps with stepped teeth 18 x 125 2 clamps with stepped teeth 18 x 200 4 universal clamping support Model 2 universal clamping support Model 3 2 DIN 787 T-slot screws M16 x 63 4 DIN 787 T-slot screws M16 x 100 4 DIN 787 T-slot screws M16 x 160 4 DIN 6379 studs M16 x 160 2 DIN 6379 studs M16 x 200 6 DIN 6330 B hexagonal nuts M16 4 extension nuts M16 6 DIN 6340 washers M16	<b>466592 1618</b>	<b>390,-</b>

4158



## Screw paste

- Mineral grease-based
- Synergistic combination of highly effective white solid lubricants
- Heat-resistant and non-washable  
(Water resistance tested in accordance with DIN 51807, P.2; grease loss after 1 hr. at 37.8 °C = 1.4%)
- Particularly when aggressive cooling lubricants are used

Contents	Usable temperature range °C	art.no.	€
75 ml	-25 to +125	<b>466593 0075</b>	<b>9,90</b>

4158



Non-rebound ...

... it's the tool.

**ATORN**<sup>®</sup>  
Performance demands quality



## Variable toggle clamps

- **Automatic span adjustment**

Variable clamping width horizontal clamp 0 to 65 mm,

Push-rod clamp 0 to 25 mm

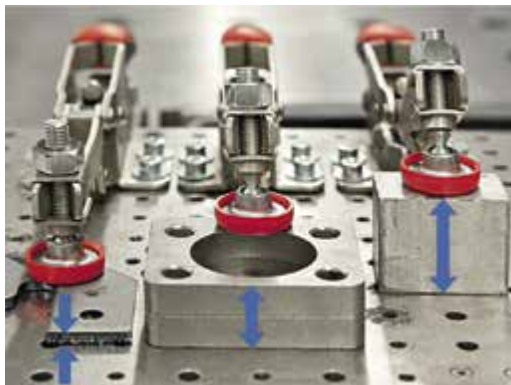
Almost unchanged clamp force

- **Set screw in joint**

Clamping force adjustment up to 25 kN

- **Large ergonomic handle**

2 component plastic handle with soft inlay and large handgrip



### Horizontal clamp with horizontal base plate

Clamping width mm	Clamp force kN	art.no.	€
0-20	1.1	<b>467051 0020</b>	<b>25,50</b>
0-40	2.5	467051 0040	27,80
0-60	2.5	467051 0060	28,50

4192

### Push-rod clamp with horizontal base plate

Clamping width mm	Clamp force kN	art.no.	€
0-10	1.1	<b>467054 0010</b>	<b>26,10</b>
0-16	2.5	467054 0016	29,20

4192



YOUR DRILL  
**GIVES UP.** • WHAT DO YOU DO? YOU REACH  
**FOR A NEW ONE**

AND SIMPLY CARRY ON:  
**SARA®GO TOOL DISPENSING SYSTEM.**

THAT'S POWER TO PRODUCE

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE

## AMF Vertical clamp

- Quick-action clamp with toggle mechanism
- Wide and quick clamp opening, complete workpiece exposure
- High final transmission with low force application, large clamping forces
- Selflocking mechanism prevents the clamp from opening due to machining forces
- **Use:** Drilling, welding, bending, grinding, testing and assembling
- Galvanised and passivated, case-hardened with greased bearing bushes
- Rivet made of stainless steel
- Complete with hardened, tempered and galvanised clamping screw
- Stainless steel version available on request

### With open supporting arm and horizontal base

Model	F1 kN	F2 kN	H mm	H1 mm	HW mm	A mm	B mm	L1 mm	Screw	art.no.	€
0	0.5	0.7	18	81	1.5 to 3.5	4	31	49	M4 x 25	<b>467001 0000</b>	<b>19,15</b>
1	0.6	1.1	19	98.5	-4 to 2	5	39	61	M5 x 30	467001 0001	<b>20,80</b>
2	0.8	1.2	23	139.5	-3 to 4.5	6	52	78	M6 x 35	467001 0002	<b>26,60</b>
3	1.2	2.5	33	186	2 to 11	8	79	112	M8 x 45	467001 0003	<b>32,-</b>
4	1.7	3	42.5	221	-6 to 22.5	10	101	141	M8 x 65	467001 0004	<b>42,10</b>
5	3	5	55.8	281	-3 to 27.5	14	140	195	M12 x 80	467001 0005	<b>67,70</b>
6	3.4	5.5	81	333	-2.5 to 55	14	165.5	231	M12 x110	467001 0006	<b>88,-</b>

4157



### With open supporting arm and vertical base

F1 kN	F2 kN	H mm	H1 mm	HW mm	A mm	B mm	L1 mm	Screw	art.no.	€
0.6	1.1	29	109	6 to 12.5	5	39	61	M5 x 30	<b>467005 0001</b>	<b>20,80</b>
0.8	1.2	38	144.5	11.5 to 19.5	6	52	78	M6 x 35	467005 0002	<b>26,60</b>
1.2	2.5	48	200	16.5 to 25	8	79	112	M8 x 45	467005 0003	<b>32,-</b>
1.7	3	65	244	16.5 to 45.5	10	101	141	M8 x 65	467005 0004	<b>42,10</b>
3	5	77	301	18 to 49	14	140	195	M12 x 80	467005 0005	<b>67,70</b>
3.4	5.5	117	369	33 to 90.5	14	165	231	M12 x110	467005 0006	<b>88,-</b>

4157



### With open supporting arm and angled base

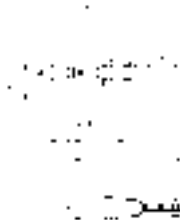
Model	F1 kN	F2 kN	H mm	H1 mm	HW mm	A mm	B mm	L1 mm	Screw	art.no.	€
1	0.8	1.1	45	125	-1.5 to 5.5	5	35	61	M 5 x 30	<b>467010 0001</b>	<b>23,30</b>
2	1	1.2	60	167	7.5 to 15.5	6	41	77	M 6 x 35	467010 0002	<b>29,10</b>
3	1.4	2.5	71	223	9 to 17.5	8	63	111	M 8 x 45	467010 0003	<b>32,-</b>
4	2	3	102	280	11 to 40	10	84	141	M 8 x 65	467010 0004	<b>42,10</b>

4157



## AMF Push-rod clamp

- Galvanised and passivated
- Case-hardened, with greased bearing bushes
- Stainless steel rivet
- Complete with hardened, tempered and galvanised clamping screw
- Stainless steel version available on request



### With small angled base

Model	F1 kN	F2 kN	H mm	H1 mm	HW mm	A mm	B mm	L1 mm	Screw	art.no.	€
0	0.8	0.8	12	49.3	12 to 20	6.5	17	66.5	M 4 x 20	<b>467025 0000</b>	<b>34,80</b>
1	1	1	15	60.5	12 to 20	8	24.5	91	M 4 x 20	467025 0001	<b>35,80</b>
2	2	2	20	85.5	17 to 25	10	32.5	114	M 6 x 25	467025 0002	<b>39,40</b>
3	2.5	2.5	25	108	22 to 35	12	37	140	M 8 x 35	467025 0003	<b>44,80</b>
5	4.5	4.5	30	129.5	30 to 50	16	41.5	171.5	M 12 x 50	467025 0005	<b>69,70</b>

4157



### Heavy-duty version

- Base body made from cast steel, lever parts and push rod made from tempering steel

Model	F1 kN	F2 kN	H mm	H1 mm	HW mm	A mm	B mm	L1 mm	Screw	art.no.	€
3	4	4	30	116	22 to 35	12	40 - 72	139	M 8 x 35	<b>467027 0003</b>	<b>56,50</b>
5	10	10	38	137.5	30 to 50	16	58 - 98	174	M12 x 50	467027 0005	<b>82,90</b>
7	25	25	55	179	30 to 50	22	59 - 105	218	M12 x 50	467027 0007	<b>171,-</b>

4157



## AMF Combination clamp

- Positioning and clamping in a single operation
- Robust and stable construction
- Fully retracted clamping arm allows for easy workpiece removal
- Galvanised and passivated
- Case-hardened, with greased bushes
- Stainless steel rivet
- Oil-resistant handle with a large handgrip surface and soft component



Model	F1 kN	F2 kN	H mm	H1 mm	HW1 mm	HW2 mm	B mm	L mm	A mm	art.no.	€
2	2.0	2.0	46.0	94	30 to 40	14 to 24	56	219	19.5	<b>467030 0002</b>	<b>89,50</b>
3	3.0	3.0	55.5	110	40 to 50	20 to 30	74	270	29.0	467030 0003	<b>109,50</b>

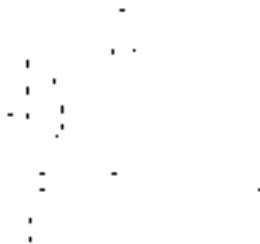
4157





## AMF Horizontal clamp

- Quick-action clamp with toggle mechanism
- Wide and quick clamp opening, complete workpiece exposure
- High final transmission with low force application, large clamping forces
- Self-locking mechanism prevents the clamp from opening due to machining forces
- **Use:** Drilling, welding, bending, grinding, testing and assembling
- Galvanised and passivated, case-hardened with greased bearing bushes
- Rivet made of stainless steel
- Complete with hardened, tempered and galvanised clamping screw
- Stainless steel version available on request



### With open supporting arm and horizontal base

Model	F1 kN	F2 kN	H mm	H1 mm	HW mm	A mm	B mm	L1 mm	Screw	art.no.	€
0	0.25	0.4	14.5	23	-5.5 to 0	4	28	79	M 4 x 25	<b>467015 0000</b>	<b>16,40</b>
1	0.8	1.1	19	30	-3 to 2.5	5	42	120	M 5 x 30	467015 0001	<b>23,80</b>
2	1	1.2	24	45	-1.5 to 5	6	64	162	M 6 x 35	467015 0002	<b>25,90</b>
3	1.8	2.5	32	48.5	-2 to 9	8	73	206	M 8 x 45	467015 0003	<b>32,80</b>
4	2	3	45	75	-4 to 24	10	113	287	M 8 x 65	467015 0004	<b>40,50</b>
5	3	5	46	73	1.7 to 25	10	123	321	M 8 x 65	467015 0005	<b>64,10</b>

4157



### With open supporting arm and angled base


Model	F1 kN	F2 kN	H mm	H1 mm	HW mm	A mm	B mm	L1 mm	Screw	art.no.	€
1	0.8	1.1	57	68	14 to 20	5	32	120	M 5 x 30	<b>467020 0001</b>	<b>23,80</b>
2	1	1.2	73	94	22 to 29.5	6.2	52	162	M 6 x 35	467020 0002	<b>28,10</b>
3	1.8	2.5	70	86.5	5 to 16	8	59	206	M 8 x 45	467020 0003	<b>34,50</b>
4	2	3	102	133	11 to 40	10	93	282	M 8 x 65	467020 0004	<b>40,50</b>

4157



## AMF Protective caps

- **For quick-action clamps**
- Made from oil-resistant neoprene to protect delicate workpieces
- Protective cap sizes correspond to the size of the clamping screws

suitable for model	Width mm	Height mm	Screw		art.no.	€
0	11	8.5	M 4	10	<b>467050 0000</b>	<b>1,14</b>
1	12.5	10	M 5	10	467050 0001	<b>1,18</b>
2	15	12	M 6	10	467050 0002	<b>1,25</b>
3+4	19	15	M 8	10	467050 0034	<b>1,37</b>
6	26	20	M12	10	467050 0006	<b>1,92</b>

4157



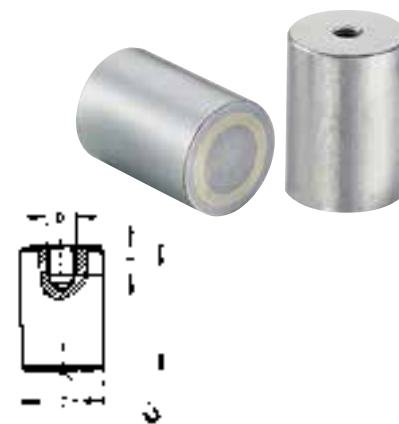
## Pot magnets

- Smooth bar gripper, no fit tolerance
- Galvanised surface, shielded system, operating temperature up to 450 °C
- When changing the holding surface, no more than 2 mm may be removed or the holding power will decrease significantly.

### Round (bar gripper with female thread)

D±0.2 mm	L±0.2 mm	D1 mm	T mm	Minimum retention force N	art.no.	€
6	20	M3	5	1.7	471025 0006	3,86
8	20	M3	5	4	471025 0008	4,09
10	20	M4	7	8.5	471025 0010	4,58
16	20	M4	5	20	471025 0016	6,80
20	25	M6	7	45	471025 0020	7,70
25	35	M6	9	100	471025 0025	12,55
32	40	M8	9	190	471025 0032	24,90

4161

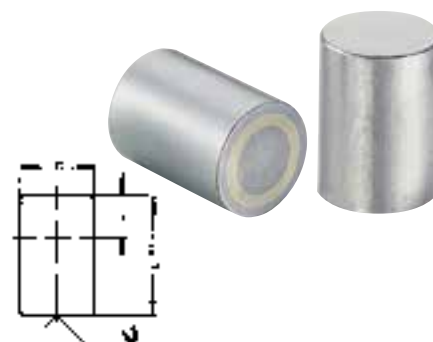


### Round (bar gripper)

- Dimension H of bar grippers can be shortened without any loss in holding power.

D±0.2 mm	L±0.2 mm	H mm	Minimum retention force N	art.no.	€
6	20	12	1.7	471045 0006	3,24
8	20	11	4	471045 0008	3,48
10	20	10	8.5	471045 0010	3,84
13	20	8	12	471045 0013	4,22
16	20	6	20	471045 0016	5,15
20	25	5	45	471045 0020	6,70
25	35	13	100	471045 0025	11,35
32	40	9	190	471045 0032	23,60

4161

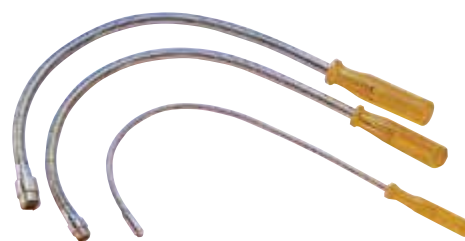


## Magnetic pick-up tool

- Polished, flexible brass tubing
- Strong holding magnet at the end

Traction N	L mm	Magnet Ø mm	Largest Ø mm	art.no.	€
5	450	6	8	471015 0006	12,60
10	450	10	12	471015 0010	13,65
18	520	13	15	471015 0013	19,55
30	520	17	19	471015 0017	29,40

4161



## Blind hole magnets

- Magnet head consisting of a chrome-plated metal sleeve
- Inset permanent magnet

Magnet Ø mm	L1 mm	Total length mm	art.no.	€
5	40	150	471060 0050	30,70
8	40	175	471060 0080	33,-

4161



### Set in a wooden box

Magnet Ø mm	art.no.	€
1.6 - 3 - 5 - 8 - 11	471060 1000	204,-

4161



## Flat pot magnets

- Galvanised surfaces, shielded system
- Operating temperature up to 200 °C
- **Note:** Hairline cracks on the holding surface of the built-in magnetic material are unavoidable for production reasons. These do not impair the function of the holding magnets in any way.
- Other dimensions available on request

### Flat with bore

- Bore with countersink

D mm	d1 mm	d2 mm	l mm	h mm	t mm	Minimum retention force N	art.no.	€
16	3.3	7	4.5	Countersink 90°	1.6	14	<b>471005 0016</b>	<b>1,65</b>
20	4.2	9	6	Countersink 90°	2.1	27	471005 0020	<b>1,77</b>
25	5.5	11	7	Countersink 90°	2.5	36	471005 0025	<b>1,89</b>
32	5.5	11	7	Countersink 90°	2.5	72	471005 0032	<b>2,03</b>
40	5.5	11	8	Countersink 90°	2.5	90	471005 0040	<b>2,67</b>
50	8.5	22	10			180	471005 0050	<b>3,39</b>
63	6.5	24	14			290	471005 0063	<b>5,95</b>
80	6.5	11.5	18			540	471005 0080	<b>11,75</b>
100	10.5	34	22			680	471005 0100	<b>31,30</b>

4161

### Flat with internally threaded pin

D±0.2 mm	d1 mm	d2 mm	t mm	l mm	h±0.2 mm	Minimum retention force N	art.no.	€
10	6	M 3	7	11.5	4.5	4	<b>471010 0010</b>	<b>1,55</b>
13	6	M 3	7	11.5	4.5	10	471010 0013	<b>1,65</b>
16	6	M 3	7	11.5	4.5	18	471010 0016	<b>1,82</b>
20	6	M 3	7	13	6	30	471010 0020	<b>1,96</b>
25	8	M 4	8	15	7	40	471010 0025	<b>2,08</b>
32	8	M 4	8	15	7	80	471010 0032	<b>2,25</b>
40	10	M 5	10	18	8	125	471010 0040	<b>3,01</b>
50	12	M 6	12	22	10	220	471010 0050	<b>4,25</b>
63	15	M 8	16	30	14	350	471010 0063	<b>7,15</b>
80	20	M10	16	34	18	600	471010 0080	<b>13,-</b>
100	22	M12	21	43	22	900	471010 0100	<b>32,20</b>
125	25	M14	20	50	26	1300	471010 0125	<b>94,60</b>

4161

### Flat

- For pressing or gluing in the mounting hole

D mm	L mm	Minimum retention force N	art.no.	€
10	4.5	4	<b>471020 0010</b>	<b>1,16</b>
13	4.5	10	471020 0013	<b>1,36</b>
16	4.5	20	471020 0016	<b>1,55</b>
20	6	30	471020 0020	<b>1,65</b>
25	7	40	471020 0025	<b>1,82</b>
32	7	80	471020 0032	<b>1,96</b>
40	8	110	471020 0040	<b>2,67</b>
50	10	200	471020 0050	<b>3,31</b>
63	14	320	471020 0063	<b>6,10</b>
80	18	600	471020 0080	<b>11,75</b>
100	22	900	471020 0100	<b>30,70</b>
125	26	1300	471020 0125	<b>91,10</b>

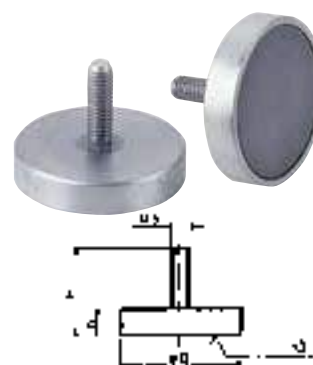
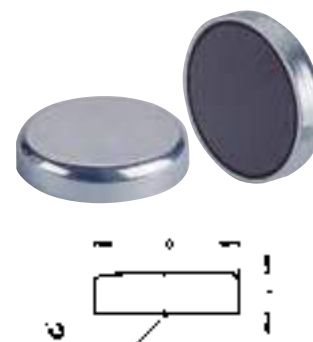
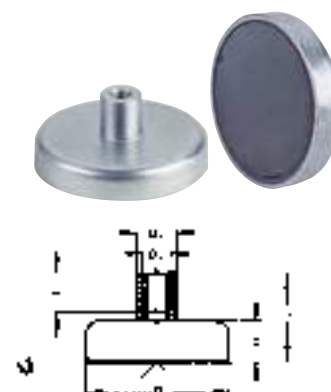
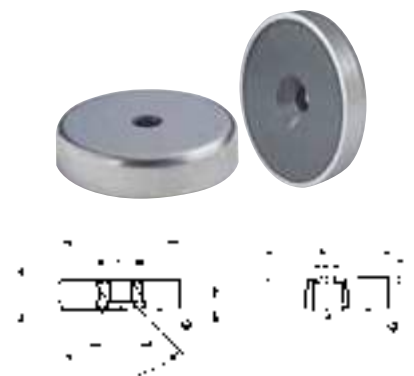
4161

### Flat with externally threaded pin

- Plane-ground holding surface

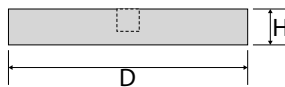
D mm	H mm	h mm	Thread	Minimum retention force N	art.no.	€
16	11.5	4.5	M 3	18	<b>470150 0016</b>	<b>1,99</b>
20	12	6	M 3	30	470150 0020	<b>2,12</b>
25	22	7	M 5	40	470150 0025	<b>2,82</b>
47	17	9	M 6	180	470150 0047	<b>5,40</b>
57	18.5	10.5	M 6	280	470150 0057	<b>9,20</b>
63	29	14	M 6	350	470150 0063	<b>10,60</b>

4161



## Flat pot magnets with neoprene protective sheath

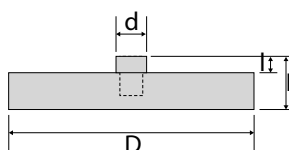
- Optimal hold on thin sheet metal
- Neoprene protective sheath for sensitive surfaces
- High lateral frictional force
- Maximum operating temperature 60°C



### Flat, threaded bore

D mm	H mm	Thread	Minimum retention force N	art.no.	€
18	6	M4	50	<b>471105 0018</b>	<b>3,60</b>
31	6	M5	75	471105 0031	<b>5,20</b>
43	6	M4	85	471105 0043	<b>5,40</b>
66	8.5	M6	180	471105 0066	<b>9,15</b>
88	8.5	M6	550	471105 0088	<b>17,50</b>

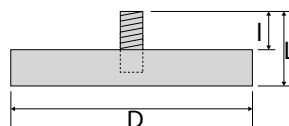
4161



### Flat, internally threaded pin

D mm	l mm	L mm	d mm	Female thread	Minimum retention force N	art.no.	€
12	7	14.8	8	M4	10	<b>471110 0012</b>	<b>2,75</b>
18	6	11.5	8	M4	37	471110 0018	<b>3,71</b>
22	6	11.5	8	M4	58	471110 0022	<b>4,12</b>
31	6	11.5	8	M4	75	471110 0031	<b>5,20</b>
43	6	10.5	8	M4	85	471110 0043	<b>5,30</b>
66	8.2	15	10	M5	180	471110 0066	<b>9,05</b>
88	8.2	17	12	M8	420	471110 0088	<b>17,50</b>

4161



### Flat, externally threaded pin

D mm	l mm	L mm	Thread	Minimum retention force N	art.no.	€
12	7	15.5	M4	13	<b>470250 0012</b>	<b>2,33</b>
18	6	12	M4	37	470250 0018	<b>3,71</b>
31	6	17	M6	89	470250 0031	<b>5,20</b>
43	6	21	M6	85	470250 0043	<b>5,70</b>
66	8.2	23.5	M8	180	470250 0066	<b>9,25</b>
88	8.2	23.5	M8	420	470250 0088	<b>17,50</b>

4161



## SARA® Magnetic clamp (Orga-Magnet)

- White with red printing
- Interior raw magnet
- Price per PU = 4 pcs.

### With gear-S

Ø mm	Height mm	Retaining force N	art.no.	€
36	8.5	9.5	<b>471021 0035</b>	<b>4,95</b>

4161



## Permanent magnet block

- Sturdy, pressure-resistant block with inset holding magnets
- For use at temperatures up to 100 °C
- Attachment method: Press-in or glue-in
- Type B with M6 thread at the rear

Type	Dimensions L x W x H mm	Minimum retention force N	art.no.	€
A	26 x 26 x 25	100	<b>471055 0001</b>	<b>14,45</b>
B	60 x 26 x 25	200	471055 0002	<b>20,60</b>

4161

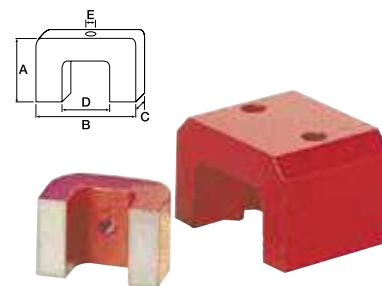


## Strong magnet

- Bridge shape
- With strong magnetic force
- Through-hole

A mm	B mm	C mm	D mm	E mm	Minimum retention force N	Weight kg	art.no.	€
20.3	30.4	20.3	15	5	40	0.063	<b>471071 0811</b>	<b>9,60</b>
25.4	38.1	25.4	19.1	5	90	0.133	471071 0812	<b>20,50</b>
29.5	44.4	28.6	22.2	5.8	120	0.197	471071 0813	<b>32,70</b>
35	58	44	28	8	230	0.5	471071 0814	<b>60,10</b>

4161



## Bar magnet

- Round or rectangular cross section
- Notches to mark corresponding poles
- Price per pair

### Rectangular

L mm	Width mm	Height mm	Weight per pair g	art.no.	€
20	10	5	5	<b>471076 0844</b>	<b>7,75</b>
40	12.5	5	30	471076 0845	<b>8,60</b>

4161

### Round

L mm	Ø mm	Weight per pair g	art.no.	€
20	6	3	<b>471077 0805</b>	<b>2,42</b>
24	8	7	471077 0806	<b>3,61</b>
30	10	18	471077 0807	<b>5,95</b>

4161



## Pot magnet

- Particularly powerful magnet, embedded in an aluminium casing
- Mounting thread on the upper side of the magnet
- Supplied with protection plate

Ø mm	Height mm	Thread	Minimum retention force N	art.no.	€
17	16	M6	20	<b>471003 0831</b>	<b>3,17</b>
21	19	M6	28	471003 0832	<b>4,54</b>
27	25.4	M6	68	471003 0833	<b>8,35</b>
35	30	M6	150	471003 0834	<b>14,70</b>
65	43	M12	400	471003 0835	<b>73,80</b>

4161

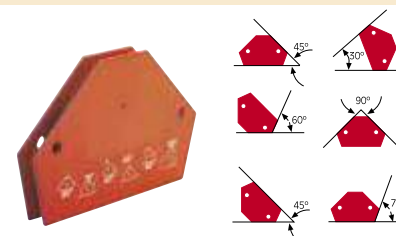


## Multi-angle magnet

- Welding and assembly aid
- With 30°, 45°, 60°, 75°, 90° and 180° angles

Dimensions	Bore hole Ø mm	Minimum retention force N	Weight kg	art.no.	€
100 x 64 x 12	2 x 5	100	0.26	<b>471558 0951</b>	<b>19,45</b>

4161

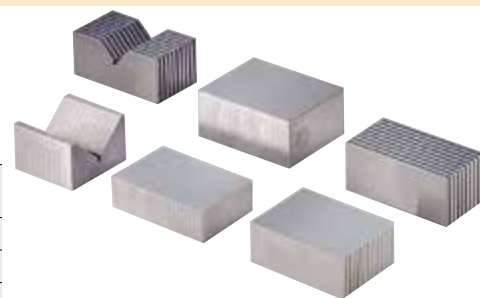


## Lamellar pole blocks

- Various different versions with longitudinal or transverse pole pitch
- Pole pitch: 3 mm steel, 1 mm brass
- For machining geometric and irregular workpieces
- Used with magnetic clamping plates

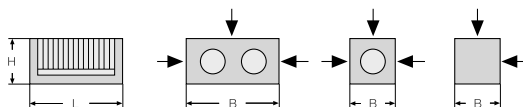
Dimensions L x W x H mm	Pole pitch	art.no.	€
100 x 70 x 48	Lengthwise	<b>471540 0002</b>	<b>140,50</b>
72 x 45 x 22	Transverse	471540 0004	96,20
100 x 70 x 41	Transverse	471540 0005	144,50
65 x 60 x 40 (with V-block)	Transverse	471540 0006	137,50
100 x 50 x 40 (with V-block)	Lengthwise	471540 0007	151,-
80 x 50 x 80	Transverse	471540 0010	182,50

4191



## Permanent magnetic clamping block

- **Not switchable**
- Clamping blocks A to C consist of a permanent magnet system with a narrow pole pitch that is effective on 2 to 3 surfaces (polishing: 4 mm)
- For clamping extremely thin steel workpieces = version D with a fine pole pitch of 1.3 mm
- Unlimited magnet life under normal industrial production conditions
- Clamping blocks can be ground and honed to half their height without significantly impairing the holding power



Type	L±0.15 mm	B±0.15 mm	H±0.15 mm	Max. angle deviation °	Pole pitch	Adhesive surfaces mm	Weight kg	art.no.	€
A	100	100	50	5´	4	1 surface 100x100 - 2 surfaces 100x50	3.6	<b>471550 0001</b>	<b>425,-</b>
B	100	50	50	5´	4	3 surfaces 100x50	1.7	471550 0002	285,-
C	100	25	25	5´	4	2 surfaces 100x25	0.5	471550 0003	182,50
D	100	25	25	5´	1.3	2 surfaces 100x25	0.5	471550 0004	336,-

4191



Type A

Type B

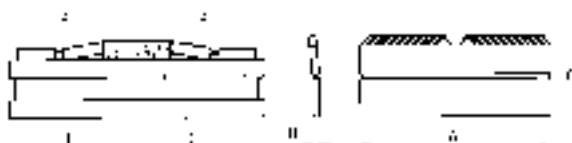
Type C

Type D



## Clamping bars

- For clamping non-magnetic materials
  - Ferro-magnetic metal
  - Longitudinal side with spring-loaded bar (pull-down effect)
  - Price per pair
1. Magnetic plate
  2. Workpiece
  3. Clamping bar



A mm	B mm	C mm	art.no.	€
100	4	45	<b>471565 1040</b>	<b>172,-</b>
150	1	40	471565 1510	239,-
150	1.6	43	471565 1516	229,-
150	2.8	43	471565 1528	229,-
250	3.7	52	471565 2537	435,-

4191



## ATORN® NEODIMIO sine table with permanent magnetic clamping plate

- For precise angle grinding and erosion work
- Nominal adhesive force 80 N / cm<sup>2</sup>
- Rotatable via the longitudinal axis from 0 to 45°
- For small and large workpieces
- Base plate precision-ground and hardened to 60 HRC
- Parallelism tolerance 0.01 / 100 mm
- Sealed against dirt and coolant
- Supplied with 2 stopper bars and chuck key

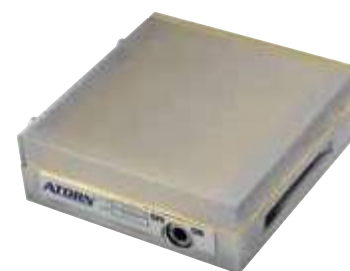


L mm	Width mm	Height mm	Weight kg	art.no.	€
140	70	68	5.5	<b>472104</b> 0140	1.669,-
175	100	77	10	472104 0175	1.779,-
250	150	79	20.5	472104 0250	1.999,-
350	150	87	35	472104 0350	2.549,-
450	150	87	44	472104 0450	3.299,-

4124

## ATORN® NEODIMIO permanent magnetic clamping plates

- For precise grinding and erosion work
- Particularly narrow transverse pole pitch
- Universal clamping of small, thin and large workpieces
- Nominal adhesive force 80 N/cm<sup>2</sup>
- A special switching system prevents deformation during the switching process
- Protection type IP65
- Possible wear-down of the pole plate 8 mm
- Supplied with 2 stopper bars, 2 clamping claws and hexagon key
- Further sizes available on request



L mm	Width mm	Height mm	Weight kg	art.no.	€
150	150	51	9	<b>472105</b> 0150	569,-
175	100	49	7	472105 0175	549,-
200	100	49	8	472105 0200	495,-
250	150	51	15	472105 0250	529,-
350	150	51	22	472105 0350	769,-
400	200	51	35	472105 0400	1.099,-

4124

## Demagnetisers

### Table-top demagnetiser

- Low power consumption
- Field strength increases depending on workpiece volume
- Further sizes available on request

Connection	L mm	Width mm	Height mm	Frequency Hz	art.no.	€
230 V	250	180	87	50	<b>472034</b> 0250	629,-

4191



### Hand-held demagnetiser

- For bulky parts, effective surface up to 150 x 75 mm
- Lightweight plastic housing
- Further sizes available on request

Connection	L mm	Width mm	Frequency Hz	art.no.	€
230 V	115	80	50 - 60	<b>472035</b> 0105	649,-

4191



**SAV** just experts Permanent lifting magnet

- Two-pole design
- Neodymium high-energy magnets for enormous lifting capacity
- High load-bearing capacity even with an air gap
- Suitable for round and flat materials
- Smooth on/off switch **with safety lock**
- Extremely compact, lightweight
- Robust and low maintenance
- For lifting panels, profiles, plates, round material and bar stock, e.g. for loading and unloading machines
- Supplied with individual test certificate

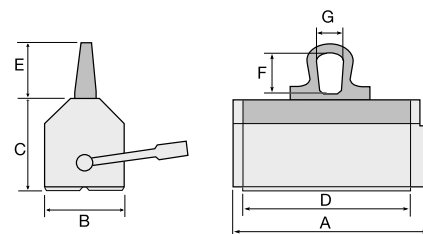


Model	L mm	Width mm	Height mm	Lifting capacity kg	Weight kg	art.no.	€
NEO 150	93	60	110	150	3	472530 0125	420,-
NEO 300	152	100	164	300	10	472530 0250	619,-
NEO 600	246	120	164	600	19	472530 0500	929,-
NEO 1000	306	146	216	1000	36	472530 1000	1.549,-

4164

**TECNOMAGNETE** Permanent lifting magnet MaxX

- Extremely compact lifting magnets
- Lightweight and powerful
- Can lift 20 to 50 times its own weight
- The „neutral crown“ prevents magnetic flux dispersion, guaranteeing optimum performance even with a large air gap
- Switchable via hand lever, **with safety lock**
- Loads are handled carefully and not damaged



Model	L mm	Width mm	Height mm	Lifting capacity kg	Weight kg	art.no.	€
MaxX 125	121	79	145	125	3.7	472520 0125	380,-
MaxX 250	181	79	145	250	5	472520 0250	490,-
MaxX 500	242	106	190	500	15	472520 0500	730,-
MaxX 1000	339	133	230	1000	35	472520 1000	1.260,-
MaxX 1500	416	166	295	1500	70	472520 1500	1.650,-
MaxX 2000	441	186	315	2000	95	472520 2000	2.230,-

4164





## UniPower electrical permanent magnet clamping plate

All the advantages of QX technology are now also available in the new HE "High Efficiency" design - with a more efficient pole design to focus the maximum magnetic flow towards the workpiece, regardless of position.

- Reduced height and weight of the magnetic clamping plate
- Full clamping force from 17 mm tool thickness
- Reliable quick coupling
- Maximum flexibility of use
- Optimised contact face
- Absolute reliability
- **Supplied with control unit**



### Model QX...UP

- Force/pole without air gap 615 daN
- Up to 16 kg/cm<sup>2</sup> in active magnetic field
- Over 75 t/m<sup>2</sup> across contact area
- Minimum workpiece thickness for maximum magnetic short circuit: 17 mm

Model	L mm	Width mm	Height mm	Number of terminals	Retaining force N	Weight kg	art.no.	€
QX 406 UP	600	400	51	24	15000	90	473350 0406	4.080,-
QX 408 UP	790	400	51	32	20000	115	473350 0408	4.750,-
QX 508 UP	790	480	51	40	25000	150	473350 0508	5.900,-

4175

### Pole extensions

Model	Ø mm	L mm	Width mm	Height mm	art.no.	€
PFR 60 fixed	60			41	473051 6041	12,-
PMQ 60 movable		60	60	41	473051 6042	35,-

4175

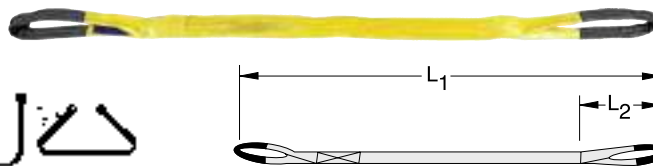


473051 6041

473051 6042

## Lifting belt

- **Compliant with EN 1492-1**
- Made from polyester, double layer stitched design
- With two reinforced end loops (loop width approx. 0.5 x belt width)
- Further sizes available on request



L1 mm	Width mm	L2 mm	Colour	Load bearing capacity direct kg	Load bearing capacity corded kg	Load bearing capacity single sling up to 7° kg	Load bearing capacity single sling 7°-45° kg	Load bearing capacity single sling 45°-60° kg	art.no.	€
1000	30	300	Violet	1000	800	2000	1400	1000	477001 1010	11,35
2000	30	300	Violet	1000	800	2000	1400	1000	477001 1020	15,40
2000	60	350	Green	2000	1600	4000	2800	2000	477001 2020	23,40
3000	90	400	Yellow	3000	2400	6000	4200	3000	477001 3030	48,30
4000	150	550	Red	5000	4000	10000	7000	5000	477001 5040	107,-

4138

## Round sling

- **Compliant with EN 1492-2**
- Made from polyester, double shell
- With woven tonnage stripes
- Further sizes available on request



L1 mm	Width mm	Colour	Load bearing capacity direct kg	Load bearing capacity corded kg	Load bearing capacity single sling up to 7° kg	Load bearing capacity single sling 7°-45° kg	Load bearing capacity single sling 45°-60° kg	art.no.	€
1000	52	Violet	1000	800	2000	700	500	477005 1010	5,70
2000	52	Violet	1000	800	2000	700	500	477005 1020	10,60
1000	57	Green	2000	1600	4000	1400	1000	477005 2010	7,60
2000	57	Green	2000	1600	4000	1400	1000	477005 2020	14,75
1000	71	Yellow	3000	2400	6000	2100	1500	477005 3010	10,40
2000	71	Yellow	3000	2400	6000	2100	1500	477005 3020	20,10
3000	71	Yellow	3000	2400	6000	2100	1500	477005 3030	30,50

4138



## Edge protection bracket

- Made from cut-resistant polyurethane
- With slots for easy fitting and attachment to a round sling
- WLL = max. load that can be lifted by the gear with a direct in-line pull

Model	Ø mm	L mm	WLL kg	art.no.	€
30	30	80	3000	<b>478001 0030</b>	<b>19,45</b>
50	50	125	5000	478001 0050	59,50

4138



## HADEF Lever hoists

- **Highly versatile; for lifting, pulling and clamping**
- Minimal net weight
- Free-wheeling mechanism for quickly feeding out the chain when unloaded
- Self-acting, fully enclosed load brake
- High-quality precision gearing
- 1.5 m lifting height, can be extended by the metre on request

### Standard lever hoists

Load bearing capacity kg	Chain strands	Load chain thickness mm	Leverage force approx. daN	Weight kg	A mm	B mm	D mm	E mm	H mm	art.no.	€
750	1	5.6	29	6.2	122	140	266	88	280	<b>472557 0750</b>	<b>223,-</b>
1500	1	7.1	29	9.6	142	167	414	107	350	472557 1500	284,-
3000	1	10	35	15.5	185	188	414	113	420	472557 3000	435,-
6000	2	10	36	27	139	188	414	113	570	472557 6000	749,-

4168

### Mini lever hoist

Load bearing capacity kg	Chain strands	Load chain thickness mm	Leverage force approx. daN	Weight kg	art.no.	€
250	1	4	25	2	<b>472558 0250</b>	<b>134,50</b>

4168



# Slewing cranes

## HADEF

**Wall-mounted slewing crane with 180° slewing range**  
**Pillar slewing crane with 270° slewing range**













- **With spur gear hoist or electric chain hoist**
- Slewing range 180°
- Designed in accordance with DIN 15018 H2/B2














**We would be happy to create a quote for you**




# Measuring equipment



Hand-held measuring equipment		
<b>INFO</b>	Vernier calliper	1320
	Vernier calliper	1320
	Digital vernier callipers Digital vernier callipers IP67	<b>NEW</b> 1330
	Digital vernier callipers with integrated radio	<b>NEW</b> 1330
	Digital special-purpose vernier callipers	1333
	Workshop vernier callipers	1337
	Depth callipers	1344
	Digital depth callipers with integrated radio	<b>NEW</b> 1347
<b>INFO</b>	Outside micrometers	1350
	Outside micrometers	1352
	Digital outside micrometers Digital outside micrometer IP65	<b>NEW</b> 1355
	Digital outside micrometers with integrated radio	<b>NEW</b> 1356
	Special-purpose outside micrometers type D7	<b>NEW</b> 1360
	Adjustable gap gauges	1368
	Depth gauges	1368
	Micrometer heads	1370
	Inside micrometers	1371
<b>INFO</b>	Inside micrometers	1374


	Inside micrometer with three-point contact	1375
	Internal precision instruments	1380
	Bore gauge	1382
Special measuring instruments		
	IFM chamfer gauge	1383
	Universal measuring instrument UNICHECK	1384
Dial indicators		
<b>INFO</b>	Dial indicators	1388
	Dial indicators	1390
	Digital dial indicator with integrated radio	<b>NEW</b> 1393
	Digital fast display callipers Digital fast display callipers, 3-point	<b>NEW</b> 1402
<b>INFO</b>	Lever dial indicators	1404
	Lever dial indicators	1404
Height meters and marking-out instruments		
	Height meters and marking-out instruments	1407
	Height meter	1410
Data transfer		
	Signal cables and interfaces	1413
	Wireless data transmission U-Wave Bluetooth	<b>NEW</b> 1417

	i-Stick receiver for integrate wireless radio system <b>NEW</b>	1417
---	---	------

	Mini processor	1417
---	----------------	------

## Tool pre-setting


	Test mandrels	1418
---	---------------	------

	Tool pre-setting devices	1419
---	--------------------------	------

## Gauge blocks and gauges


<b>INFO</b>	Gauge blocks	1421
-------------	--------------	------

	Gauge blocks	1422
---	--------------	------


	Plain and thread gauges	1428
---	-------------------------	------

## Angle and angle gauge


	Goniometer	1436
---	------------	------


	Angle	1438
---	-------	------

## Aid

	Marking-out instruments, Scribing calliper	1440
---	--	------

	Line gauges	1442
---	-------------	------


	Tape measures and folding rulers	1443
---	----------------------------------	------

	Grinding and feeler gauges	1447
---	----------------------------	------


	Stands	1451
---	--------	------

	Measuring tables <b>NEW</b>	1456
---	-----------------------------	------

	Measuring and inspection plates	1457
---	---------------------------------	------

	Concentricity gauges	1460
---	----------------------	------


	Prisms	1461
---	--------	------


	Clamping systems	1463
--	------------------	------

	Inclinometers	1464
--	---------------	------

	3D probes, edge finders, centring devices	1466
--	---	------


## Optics

	Magnifying glasses	1471
--	--------------------	------


	Stereoscopic zoom microscope binocular <b>NEW</b>	1474
---	---	------

	Inspector digital microscope <b>NEW</b>	1475
---	---	------


	PJ-Plus profile projector <b>NEW</b>	1477
---	--------------------------------------	------

	M2 data processing system <b>NEW</b>	1479
--	--------------------------------------	------

## Roughness, linear scales


	Roughness meter SJ-210/-310/-411/-412 <b>NEW</b>	1480
--	--	------


<b>INFO</b>	Linear scale	1485
-------------	--------------	------


	Linear scales	1486
--	---------------	------


## Layer, hardness, temperature, force, mass

	Layer thickness measuring instruments	1488
--	---------------------------------------	------

	Ultrasound wall thickness measuring instrument	1488
--	--	------


	Rebound hardness tester	1489
--	-------------------------	------

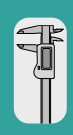
	Laser distance measuring instrument <b>NEW</b>	1489
---	--	------

	Force measuring instruments	1489
---	-----------------------------	------

<b>INFO</b>	Scales quick finder	1491
-------------	---------------------	------



































	Crane scale HFD <b>NEW</b>	1492
--	----------------------------	------

	Counting scales	1493
--	-----------------	------



## Summary of icons used for measuring technology

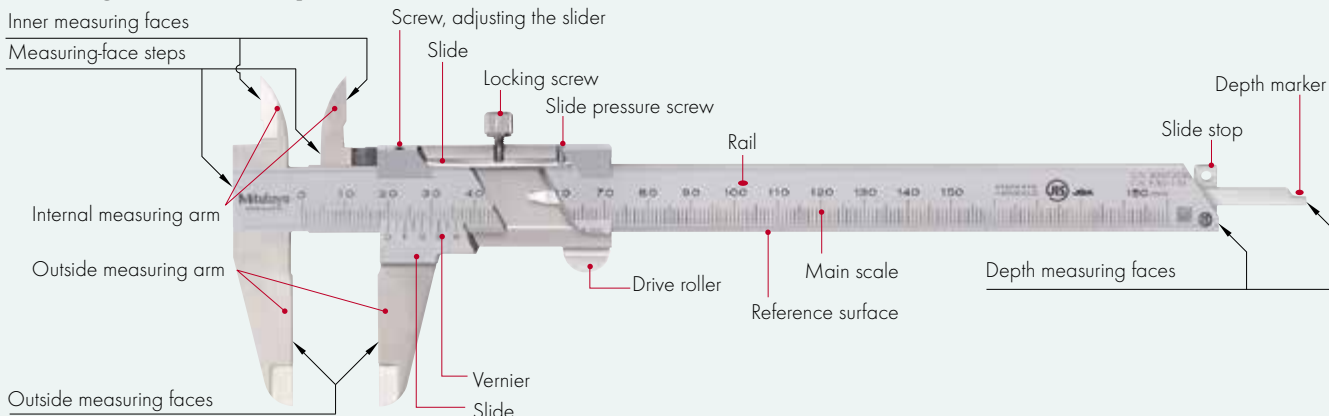
INFO

Thread angle	 55°	 60°	
IP protection class	 IP55	 IP64	 IP67
DIN standard constructional dimensions	 Werks-norm Accuracy and execution in accordance with company standard	 DIN 13 Accuracy and execution according to DIN	 ähnl. DIN 2250 C Accuracy and execution similar to DIN
Gauge block standard	 DIN EN ISO 3650 Accuracy and execution according to DIN		
Tolerance standard	 DIN 13 6g	 H7	 DIN 874
Depth gauge	 $\varnothing 1,5$ mm Depth gauge round $\varnothing 1.5$ mm	 Standard depth gauge	
Material property	 INOX Stainless steel	 All parts hardened	
	 Carbide-tipped measuring faces (Micrometers)	 Carbide-tipped measuring faces (Sliding callipers)	
Spindle pitch	 0,5 mm	 1 mm	 2 mm
Function	 Run-out measurement		
Reading	 0,0001 mm	 0,001 mm	 0,01 mm
Unit	 inch mm		
Measuring system	 ABSOLUTE	 KEEP-TRONIC	
Packing, scope of delivery	 Stable box	 Plastic case	 Test certificate included
Data output format	 Digi-matic	 RS232C	 USB

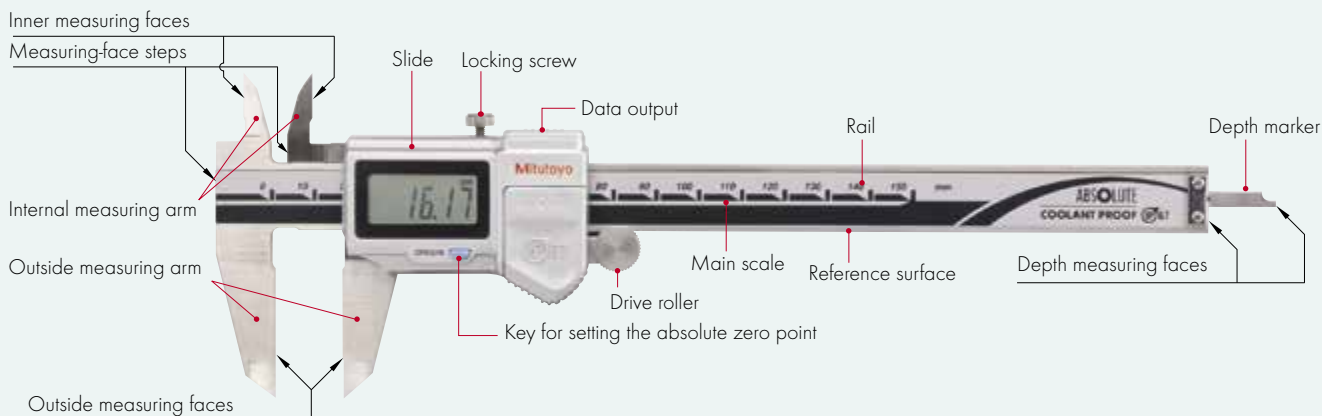
# Calipers

INFO

## Analog Vernier calipers

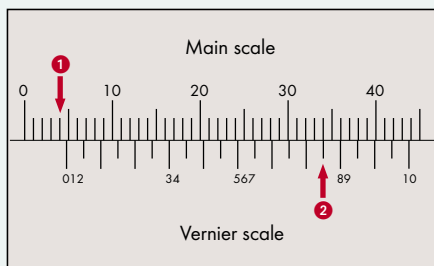


## Absolute Digimatic caliper



## Reading off the scale

### Vernier caliper



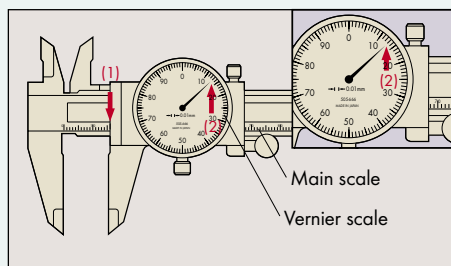
#### Graduation 0.05 mm

(1) Reading off main scale	4 mm
(2) Reading off Vernier scale	0.75 mm
Reading	4.75 mm

Note: Above left, 0.75 mm (2) is read at the position at which a graduation stripe of the main scale is aligned with a graduation of the Vernier scale.

## Reading off the scale

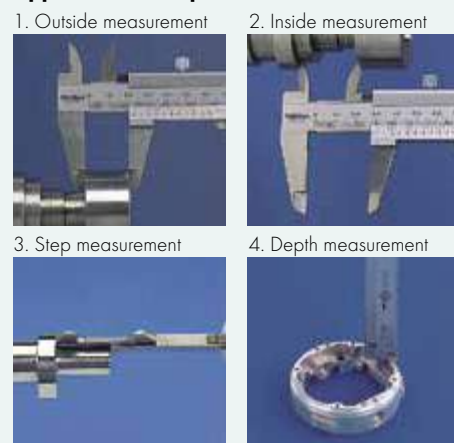
### Dial caliper



#### Graduation 0.01 mm

(1) Reading off main scale	16 mm
(2) Reading off Vernier scale	0.13 mm
Reading	16.13 mm

## Application examples



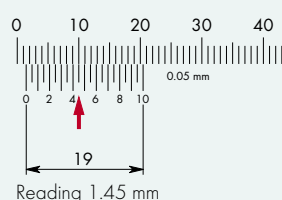
## Types of Vernier scales

The Vernier scale is attached to the caliper's slider, and each graduation of the scale is 0.05 mm smaller than one main scale division of 1 mm. This means that as the caliper jaws are adjusted by 0.05 mm the subsequent Vernier scale line aligns with a main scale line and so indicates the number of 0.05 mm units to be counted (although for the sake of simplicity the scale is numbered in fractions of a mm).

Alternatively, one can choose a Vernier graduation 0.05 mm shorter than two graduations of the main scale, to obtain a long Vernier scale. The scale is thus easier to read, while the principle of measurement, and the graduation, remain unchanged.

### Standard Vernier scale

Graduation 0.05 mm



### Long Vernier scale

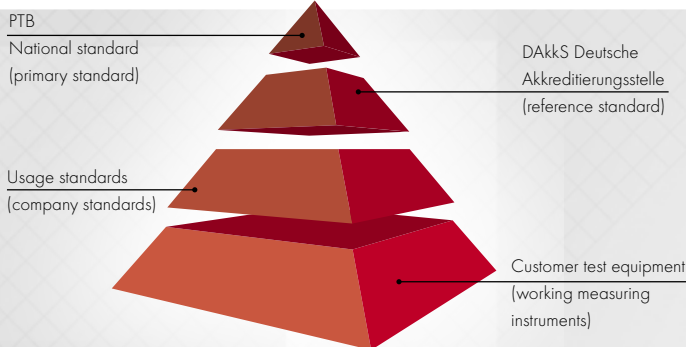
Graduation 0.05 mm



# Test equipment monitoring service

## ISO 9000 ff

- DAKS calibration laboratory according to DIN EN ISO/IEC 17025:2005
- Advice on setting up monitoring and management processes for your test equipment
- Short-term calibration of both new test equipment and test equipment which is already in use
- Modular software for monitoring and managing test equipment with target data generation
- Full service: management and calibration of your entire fleet of test equipment with data transfer
- Calibrated test equipment available from stock in the short term
- As calibrations are considered to be services, the calibration prices are to be understood as strictly net and are to be added to the tool's respective net sales price.



## SARA® Sliding callipers

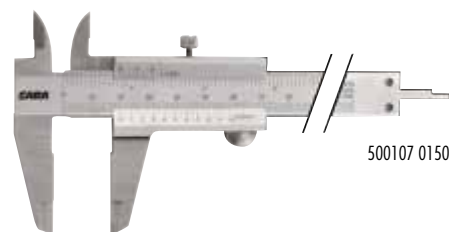


- Reading parts matt chrome-plated
- Raised guideways
- Vernier scale 0.05 mm extended to 39 mm

### Locking screw on top

Measurement range mm	Jaw length mm	Vernier mm/inch	art.no.	€	DAKkS calibration art.no.	€
150	40	0.05 / 1/128"	<b>500107</b> 0150	<b>23,70</b>	072008 D001	<b>14,-</b>

5108



### Thumb lock

Measurement range mm	Jaw length mm	Vernier mm/inch	art.no.	€	DAKkS calibration art.no.	€
150	40	0.05 / 1/128"	<b>500108</b> 0150	<b>28,40</b>	072008 D001	<b>14,-</b>

5108



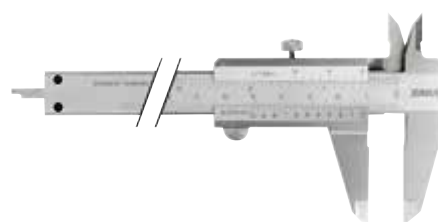
## SARA® Sliding calliper for left-handed users



- Reading parts matt chrome-plated
- Raised guideways
- Vernier scale 0.05 mm extended to 39 mm

Measurement range mm	Jaw length mm	Vernier mm/inch	art.no.	€	DAKkS calibration art.no.	€
150	40	0.05 x 1/128"	<b>500905</b> 0150	<b>54,50</b>	072008 D001	<b>14,-</b>

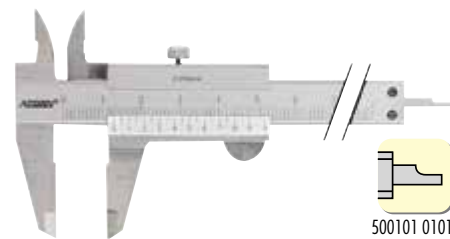
5108



## ATORN® Vernier callipers



- Reading parts matt chrome-plated
- Raised guide edges
- Overlapping measuring areas
- Vernier scale 0.05 mm extended to 39 mm
- Thread table on the back



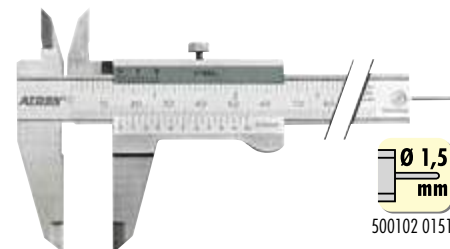
500101 0101

### Locking screw on top

- 500101 0100 Vernier scale 0.05 mm to 19 mm

Measurement range mm	Jaw length mm	Vernier mm/inch	Depth bar	art.no.	€	DAkkS calibration art.no.	€
100	30	0.05	Flat	500101 0101	26,-	072008 D001	14,-
150	40	0.05 x 1/128"	Ø 1.5 mm	500102 0151	30,10	072008 D001	14,-
150	40	0.05 x 1/128"	Flat	500102 1150	30,10	072008 D001	14,-

5190



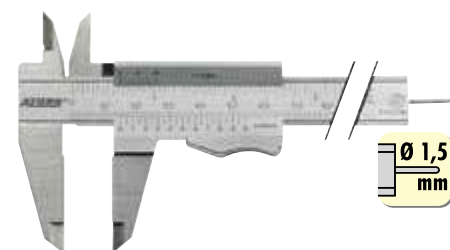
500102 0151

### Torque adjustment

- Vernier scale 0.05 mm extended to 39 mm

Measurement range mm	Jaw length mm	Vernier mm/inch	art.no.	€	DAkkS calibration art.no.	€
150	40	0.05x1/128"	500104 0151	30,10	072008 D001	14,-

5190

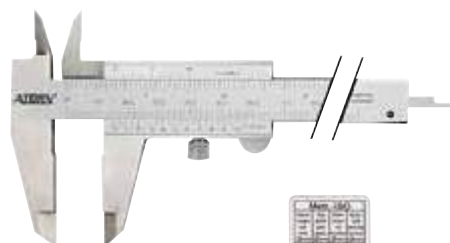
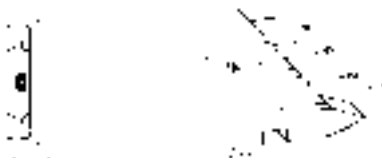


Ø 1,5 mm

## ATORN® Sliding calliper with double V guide

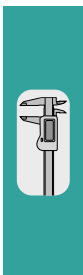


- For parallax-free readings
- Lapped measuring faces
- Locking screw on bottom
- Thread table on the back
- Vernier scale 0.05 mm extended to 39 mm



Measurement range mm	Jaw length mm	Vernier mm/inch	art.no.	€	DAkkS calibration art.no.	€
150	40	0.05 x 1/128"	500250 0150	81,30	072008 D001	14,-

5190





## Mitutoyo Sliding callipers



- Reading parts matt chrome-plated
- Raised guide edges
- Vernier scale 0.05 mm extended to 39 mm

### Locking screw on top

- 500201 0152 \*with round depth gauge, Ø 1.9 mm

Measurement range mm	Jaw length mm	Vernier mm/inch	art.no.	€	DAkkS calibration art.no.	€
150	40	0.05/-	500201 0151	31,-	072008 D001	14,-
150	40	0.05/-	500201 0152 *	49,-	072008 D001	14,-
150	40	0.05 x 1/128"	500201 0150	31,-	072008 D001	14,-
200	50	0.05 x 1/128"	500201 0200	79,-	072008 D001	14,-
300	64	0.05 x 1/128"	500201 0300	192,-	072008 D002	19,-
150	40	0.02 x 1/1000"	500203 0150	59,-	072008 D001	14,-
200	50	0.02 x 1/1000"	500203 0200	86,-	072008 D001	14,-
300	64	0.02 x 1/1000"	500203 0300	211,-	072008 D002	19,-
150	40	0.02/-	500204 0150	37,-	072008 D001	14,-
200	50	0.02/-	500204 0200	62,-	072008 D001	14,-

5102

### Locking screw on bottom

Measurement range mm	Jaw length mm	Vernier mm/inch	art.no.	€	DAkkS calibration art.no.	€
150	40	0.05 x 1/128"	500207 0150	55,-	072008 D001	14,-

5102

### Top locking screw and carbide-tipped measuring areas

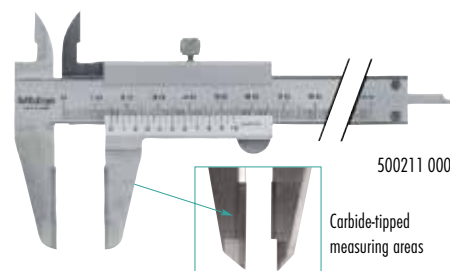
Measurement range mm	Jaw length mm	Vernier mm	Description	art.no.	€	DAkkS calibration art.no.	€
150	40	0.05	Carbide-tipped outside measuring areas	500211 0001	125,-	072008 D001	14,-
200	50	0.05	Carbide-tipped outside measuring areas	500211 0002	160,-	072008 D001	14,-
300	64	0.05	Carbide-tipped outside measuring areas	500211 0003	347,-	072008 D002	19,-
150	40	0.05	Carbide-tipped inside and outside measuring areas	500211 0004	198,-	072008 D001	14,-

5102

### Thumb lock

Measurement range mm	Jaw length mm	Vernier mm/inch	art.no.	€	DAkkS calibration art.no.	€
150	40	0.05	500213 0151	45,-	072008 D001	14,-
150	40	0.05 x 1/128"	500213 0150	38,-	072008 D001	14,-
200	50	0.05 x 1/128"	500213 0200	93,-	072008 D001	14,-
300	64	0.05 x 1/128"	500213 0300	210,-	072008 D002	19,-

5102



## Mitutoyo Caliper, "QUADRI" version

The MITUTOYO "QUADRI" caliper can be used for four different measuring applications:

#### 1. External measurements



#### 2. Internal measurements



#### 3. Depth measurements



#### 4. Pitch (height) measurements or marking-out work



Measurement range	L	a	b	c	d
0-150	231	40	21.0	16.5	16
0-200	288	50	24.5	20.0	16
0-300	403	64	27.5	22.0	20

## Thread table

- Self-adhesive film, 23 x 51 mm
- With details of the core hole diameter and respective drill bit for the most common metric threads from Ø 3 to 20 and Whitworth threads from Ø 1/4 to 1 inch



Designation	art.no.	€
Thread table	<b>500540 0001</b>	<b>5,-</b>

5102

## SARA® Test and adjustment gauge for Vernier calliper

- for quick testing and adjustment of measuring jaws, cross-tips and depth markers
- hardened, ground and lapped
- the depth marker is tested through the centre hole

External Ø mm	Interior Ø mm	Height mm	art.no.	€	DAkkS calibration art.no.	€
30 ± 0.002	10 ± 0.002	10 ± 0.010	<b>540201 3010</b>	<b>122,-</b>	073103 D086	<b>104,-</b>

5135



## Case for pocket sliding calliper

- For 150 mm sliding calliper with Vernier readings

Designation	art.no.	€
Vernier calliper wallet	<b>500541 0150</b>	<b>4,28</b>

5108

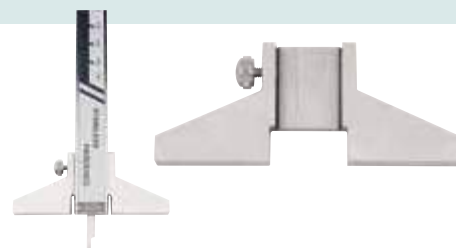


## SARA® Depth gauge bridge

- For retrofitting sliding callipers with a measuring range from 150 mm to 200 mm

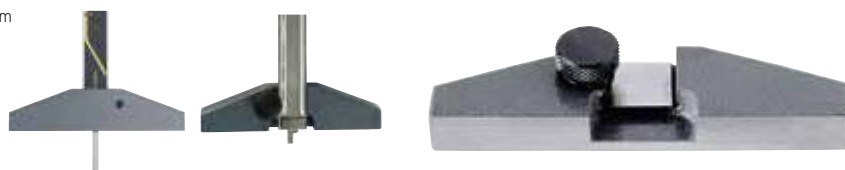
Base size mm	art.no.	€	Factory calibration art.no.	€
74 x 6.5	<b>500501 7565</b>	<b>31,50</b>	073103 W143	<b>14,-</b>

5108



## Mitutoyo Depth gauge bridge

- Sizes 1075 / 1100 for sliding callipers up to a measuring range of 200 mm
- Size 1250 for sliding callipers with a measuring range of 300 mm



Base size mm	a mm	b mm	c mm	d mm	e mm	art.no.	€	Factory calibration art.no.	€
75x12	25	75	24.5	9	16	<b>500501 1075</b>	<b>50,-</b>	073103 W143	<b>14,-</b>
100x12	25	100	24.5	9	16	<b>500501 1100</b>	<b>56,-</b>	073103 W143	<b>14,-</b>
125x14	30	125	28.5	11.5	20	<b>500501 1250</b>	<b>63,-</b>	073103 W143	<b>14,-</b>

5102

## SARA® Dial callipers



- Matt chrome-plated scale
- Locking screw on top
- Fine adjustment via thumbwheel
- One pointer rotation represents 1 mm
- Dial clamp, simple zeroing
- Dirt-resistant rack



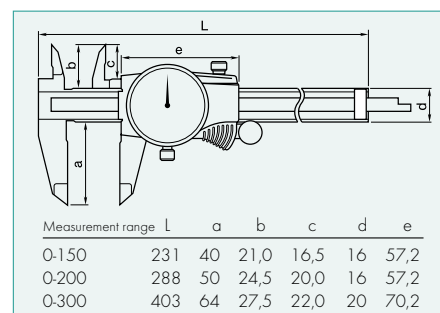
Measurement range mm	Jaw length mm	Reading mm	art.no.	€	DAkkS calibration art.no.	€
150	40	0.01	500110 0151	68,-	072008 D001	14,-

5108

## Mitutoyo Dial callipers



- Matt chrome-plated scale
- Impact-resistant dial indicator
- Jewel bearing
- Yellow dial face
- Locking screw on top
- Fine adjustment via thumbwheel, rapid adjustment possible with one hand
- Impact-resistant rack



### Scale division 0.01 mm

Measurement range mm	Jaw length mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150	40	0.03	500410 0150	117,-	072008 D001	14,-
200	50	0.03	500410 0200	226,-	072008 D001	14,-

5102



### Scale division 0.02 mm

Measurement range mm	Jaw length mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150	43	0.03	500440 0150	104,-	072008 D001	14,-
200	50	0.03	500440 0200	210,-	072008 D001	14,-
300	63	0.04	500440 0300	316,-	072008 D002	19,-

5102



THE **BENCHMARK**  
STANDARD

Mitutoyo



MITUTOYO  
Measuring equipment  
catalogue  
approx. 620 pages  
Art.no. 019900 0069

Overview of all free manufacturers' catalogues  
on page 16/17

**SARA® Digital sliding calliper**

- Locking screw on top
- High-contrast, easily readable LCD display
- External, internal, depth and step measurements
- Thread table on the back
- Functions: ON/OFF, ZERO, mm/inch
- Supplied with CR2032 battery, no. 548079 6032



500702 0150

Measurement range mm/inch	Jaw length mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
100/4"	30	0.03	500702 0100	37,60	072008 D001	14,-
150/6"	40	0.03	500702 0150	57,50	072008 D001	14,-
200/8"	50	0.03	500702 0200	90,60	072008 D001	14,-
300/12"	60	0.04	500702 0300	186,50	072008 D002	19,-

5108

**SARA® Absolute digital sliding calliper**

- With absolute scale, zeroing not required
- Locking screw on top
- External, internal, depth and step measurements
- High-contrast, easily readable LCD display
- Thread table on the back
- Functions: ON/OFF, ZERO, mm/inch
- Supplied with CR2032 battery, no. 548079 6032



Measurement range mm/inch	Jaw length mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150/6"	40	0.03	500702 1150	73,80	072008 D001	14,-

5108

**SARA® Digital sliding calliper for left-handed users**

- Large high-contrast digital display
- Locking screw on top
- Precision-lapped measuring faces
- **Functions:** ON/OFF, ZERO, mm/inch
- Supplied with SR44 battery, no. 500534 0001



Measurement range mm/inch	Jaw length mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150/6"	40	0.03	500700 1150	94,10	072008 D001	14,-

5108



Precision ...

... but digital.

**ATORN®**  
 Performance demands quality

## ATORN® Digital sliding calliper

NEW



- **KEEPTRONIC** electronics store the 0-point, operating keys lock to prevent accidental alteration of the 0-point, battery life approx. 3 years
- Digit height 10mm
- Data output **multiCOM** can be used as USB, Digi-matic or RS232C
- **Functions:** ON/OFF, user-defined zeroing (RESET), mm/inch, PRESET user-defined values (for version with data output)
- Supplied with battery CR 2032, No. 548079 6032
- **Special accessories:** Data cable Types P-RS 232 / P-Digi-matic / P-USB, No. 512521....

Data output multiCOM



Measurement range mm	Jaw length mm	Depth bar	Data output	art.no.		DakkS calibration	
				€	art.no.	€	
150	40	Ø 1.6 mm	No	500506 4150	112,-	072008 D001	14,-
150	40	Flat	No	500506 4151	112,-	072008 D001	14,-
150	40	Ø 1.6 mm	Yes	500506 3150	132,50	072008 D001	14,-
150	40	Flat	Yes	500506 3151	132,50	072008 D001	14,-
300	64	No	Yes	500506 2300	239,-	072008 D002	19,-

5194

## ATORN® IP67 digital sliding calliper

NEW



- **KEEPTRONIC** electronics store the 0-point, operating keys lock to prevent accidental alteration of the 0-point, battery life approx. 3 years
- Digit height 10mm
- Inductive, waterproof FPS measuring system (Fluid Protected Measuring System)
- **Functions:** ON/OFF, user-defined zeroing, mm/inch
- Supplied with CR 2032 battery, No. 548079 6032

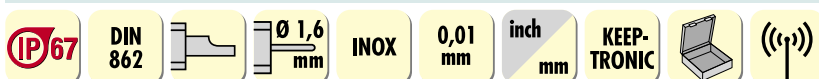


Measurement range mm	Jaw length mm	Depth bar	art.no.		DakkS calibration	
			€	art.no.	€	
150	40	Ø 1.6 mm	500525 2150	163,-	072008 D001	14,-
150	40	Flat	500525 2151	163,-	072008 D001	14,-

5194

## ATORN® Digital Vernier callipers IP67 wireless

NEW



- **KEEPTRONIC** electronics store the 0-point, operating keys lock to prevent accidental alteration of the 0-point, battery life approx. 3 years
- Digit height 10mm
- Inductive, waterproof FPS measuring system (Fluid Protected Measuring System)
- Integrated radio system **ATORN-Integrated-Wireless** for maximum freedom of movement (radio range 6m)
- **Functions:** ON/OFF, user-defined zeroing, mm/inch
- Supplied with CR 2032 battery, No. 548079 6032

integrated radio



Measurement range mm	Jaw length mm	Depth bar	art.no.		DakkS calibration	
			€	art.no.	€	
150	40	Ø 1.6 mm	500527 0150	220,-	072008 D001	14,-
150	40	Flat	500527 0151	220,-	072008 D001	14,-

5194

## Protection classes as per DIN EN 60529

INFO

Identifier 1:

Protection against foreign objects and dust	Foreign objects > 50.0 mm Foreign objects > 12.0 mm Foreign objects > 2.5 mm foreign objects > 1.0 mm Protection against dust Dust-tight	IP 1. IP 2. IP 3. IP 4. IP 5. IP 6.
---	---	--

+

Identifier 2:

Protection against water	Vertically dripping water Water dripping at an angle Spray water Splash water Water jets High-intensity water jets Brief submersion Sustained submersion (depth in m)	IP .1 IP .2 IP .3 IP .4 IP .5 IP .6 IP .7 IP .8
--------------------------	--	--

Example: **IP67**

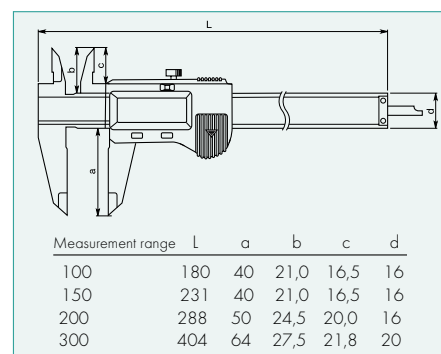
- Dust-tight = IP 6.
- Brief submersion = IP 7.
- Protection class DIN 40050: = IP 67

## Mitutoyo Digital sliding calliper ABSOLUTE! AOS!



ABSOLUTE®

- Particularly suitable for use in rough work conditions due to the electromagnetic inductive **AOS** measuring process (**A**dvanced **O**n-site **S**ensor), which is not sensitive to dirt or moisture on the scale
- **“ABSOLUTE” scale** for one-time zeroing
- **Digit height 9 mm (11 mm for MB 300 mm)**
- Battery life approx. 18,000 hours
- **Functions:** ON/OFF, zero point at battery change (ORIGIN), user-defined zeroing (ZERO/ABS), battery check
- Supplied with SR44 battery (No. 500534 0001) and factory certificate
- **Special accessories:** Digimatic cable Type C, No. 563100 0021 (1 m), No. 563100 0022 (2 m), USB cable Type C-USB, No. 563110 0003



### Without thumbwheel

Measurement range mm	Jaw length mm	Depth bar	Data output	art.no.		DkkS calibration	
				art.no.	€	art.no.	€
100	40	Ø 1.9 mm	No	500560 2100	210,-	072008 D001	14,-
100	40	Ø 1.9 mm	Yes	500560 3100	222,-	072008 D001	14,-
150	40	Ø 1.9 mm	No	500560 2150	115,-	072008 D001	14,-
150	40	Ø 1.9 mm	Yes	500560 3150	165,-	072008 D001	14,-
150	40	Flat	No	500560 0150	115,-	072008 D001	14,-
150	40	Flat	Yes	500560 1150	142,-	072008 D001	14,-
200	50	Flat	No	500560 0200	181,-	072008 D001	14,-
200	50	Flat	Yes	500560 1200	202,-	072008 D001	14,-
300	64	Flat	Yes	500560 1300	289,-	072008 D002	19,-

5102



### With thumbwheel

Measurement range mm	Jaw length mm	Depth bar	Data output	art.no.		DkkS calibration	
				art.no.	€	art.no.	€
100	40	Ø 1.9 mm	Yes	500562 3100	242,-	072008 D001	14,-
150	40	Ø 1.9 mm	Yes	500562 3150	167,-	072008 D001	14,-
150	40	Flat	Yes	500562 1150	168,-	072008 D001	14,-
200	50	Flat	Yes	500562 1200	238,-	072008 D001	14,-
300	64	Flat	Yes	500562 1300	331,-	072008 D002	19,-

5102



### With carbide measuring faces for external measurements

Measurement range mm	Jaw length mm	Depth bar	Data output	Thumb roller	art.no.		DkkS calibration	
					art.no.	€	art.no.	€
150	40	Flat	Yes	Yes	500566 1150	293,-	072008 D001	14,-
150	40	Flat	Yes	No	500566 0150	260,-	072008 D001	14,-
200	50	Flat	Yes	Yes	500566 1200	339,-	072008 D001	14,-

5102



Carbide-tipped measuring areas

### With carbide measuring faces for external and internal measurements, no thumbwheel

Measurement range mm	Jaw length mm	Depth bar	Data output	art.no.		DkkS calibration	
				art.no.	€	art.no.	€
150	40	Flat	Yes	500564 0150	500,-	072008 D001	14,-
200	50	Flat	Yes	500564 0200	557,-	072008 D001	14,-

5102



## Mitutoyo IP67 digital sliding calliper



ABSOLUTE®



Sicherheit  
Staub- und  
wasserge-  
schützt  
www.tuv.com  
ID: 2011207400

- **ABSOLUTE scale**
- Inductive functional principle
- Switches off automatically after 20 minutes of inactivity
- New, high-contrast display
- Digit height 9 mm (11 mm for MB 300 mm)
- Battery life approx. 5 years
- Battery change possible without a screwdriver
- **Functions:** ZERO/ORIGIN, automatic ON/OFF, battery check
- Supplied with SR 44 battery, No. 500534 0001
- **Special accessories:** Digimatic cable Type A, No. 563100 0001 (1 m), No. 563100 0002 (2 m), USB cable Type A-USB, No. 563110 0001

Measurement range mm	Jaw length mm	Depth bar	Data output	art.no.		DakkS calibration	
				art.no.	€	art.no.	€
150	40	Flat	No	500514 7150	168,-	072008 D001	14,-
200	50	Flat	No	500514 7200	233,-	072008 D001	14,-
150	40	Ø 1.9 mm	No	500515 7150	168,-	072008 D001	14,-
150	40	Flat	Yes	500516 7150	215,-	072008 D001	14,-
200	50	Flat	Yes	500516 7200	273,-	072008 D001	14,-
300	64	Flat	Yes	500516 7300	360,-	072008 D002	19,-

5102

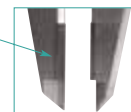
### With carbide measuring faces for external and internal measurements

Measurement range mm	Jaw length mm	Depth bar	Data output	art.no.		DakkS calibration	
				art.no.	€	art.no.	€
150	40	Flat	Yes	500518 7150	428,-	072008 D001	14,-
200	50	Flat	Yes	500518 7200	487,-	072008 D001	14,-

5102



500518 7200

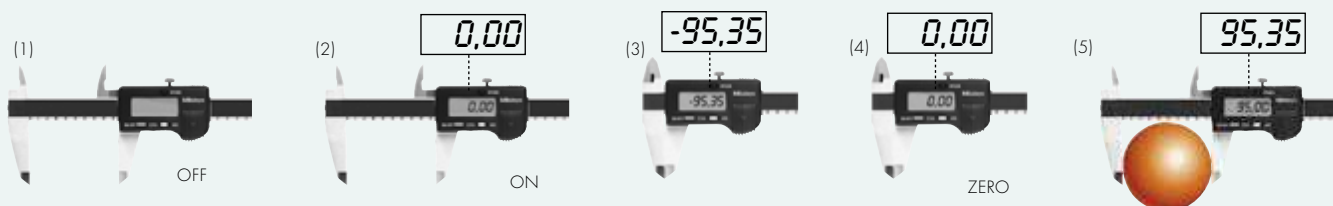


Carbide-tipped measuring areas



### Conventional measurement method

INFO



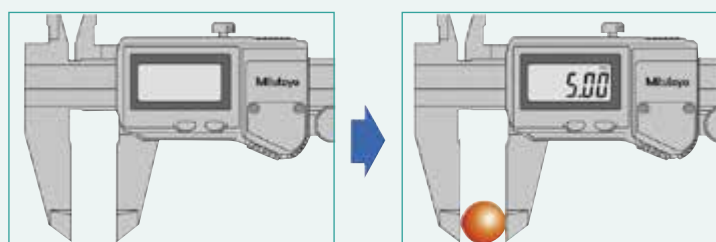
### Absolute measurement method

INFO

ABSOLUTE®

**Absolutely certain, absolutely ingenious:**  
the Absolute System

All Mitutoyo measuring instruments with this logo have the ingenious „Absolute System“. Their integrated absolute scale requires the zero position to be set only once, and this zero point will be used from then on for all future measurements. This ensures maximum measurement precision even at maximum traversing speeds.



Power OFF

Power ON

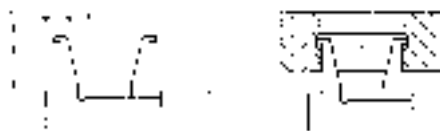
**Absolutely certain!**  
**Absolutely uncomplicated!**



### SARA® Groove calliper



- For measuring the diameter of internal grooves
- Reading parts matt chrome-plated
- Error margin 0.1 mm



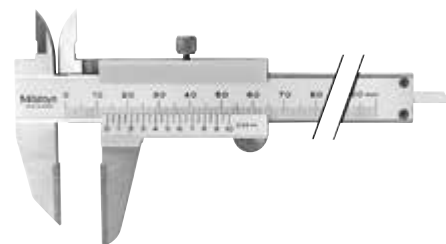
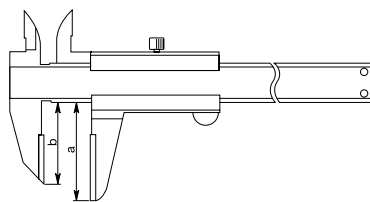
Measurement range mm	Vernier mm	A mm	B mm	C mm	art.no.	€	DAkkS calibration art.no.	€
10-160	0.05	1.5	3.5	25	500805 0160	157,-	072008 D001	14,-

5108

### Mitutoyo Special-purpose sliding callipers



- Reading parts matt chrome-plated
- Raised guideways
- Vernier scale 0.05 mm extended to 39 mm



#### Scribing calliper with carbide measuring faces and depth gauge

Measurement range mm	a mm	b mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150	40	33	0.05	500903 0001	148,-	072008 D001	14,-
200	50	43	0.05	500903 0002	178,-	072008 D001	14,-
300	64	54	0.08	500903 0003	376,-	072008 D002	19,-

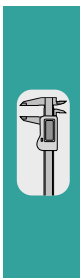
5102

### ATORN® Digital internal groove calliper



- For measuring the diameter of internal grooves
- **KEEPTRONIC** electronics store the zero point, operating keys lock to prevent accidental alteration of the zero point. Battery life approx. 3 years
- **multiCOM** data output, can be used as USB, Digi-matic or RS-232
- Hardened measuring and guide surfaces
- **Functions:** ON/OFF, user-defined zeroing (RESET), mm/inch
- Supplied with CR 2032 battery, No. 548079 6032
- **Optional accessories:** Data cables, type P-RS 232 / P-Digi-matic / P-USB, no. 512521....

Data output multiCOM



Measurement range mm	A mm	B mm	C mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
10-160	0.9	3	25	0.06	500643 1160	480,-	072008 D001	14,-
20-160	2	5	40	0.06	500643 0160	549,-	072008 D001	14,-

5194

Over 200,000 tools available online!  
Register online now!

www.saratools.com



## SARA® Digital special-purpose sliding calliper



- Locking screw on top
- Measuring jaws for different special applications
- **Functions:** ON/OFF, ZERO, mm/inch
- Supplied with CR2032 battery, No. 548079 6032

### With adjustable measuring jaw

Measurement range mm	A mm	B mm	C mm	art.no.	€	DAkkS calibration art.no.	€
150	110	40	10	500701 2000	168,-	072008 D001	14,-

5108



### Pointed sliding calliper

Measurement range mm	Edge length mm	art.no.	€	DAkkS calibration art.no.	€
150	40	500701 2010	157,-	072008 D001	14,-

5108



### With long, slender measuring jaws for internal measurements

Measurement range mm	A mm	B mm	art.no.	€	DAkkS calibration art.no.	€
10-150	7	60	500701 2030	224,-	072008 D001	14,-

5108



### Shaft key groove gauge

- With flat measuring faces

Measurement range mm	A mm	B mm	E mm	art.no.	€	DAkkS calibration art.no.	€
0-150	40	18	0.75	500701 2040	157,-	072008 D001	14,-

5108



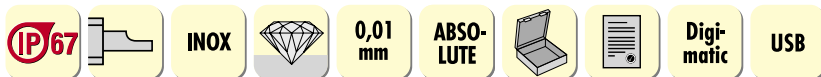
### Wall thickness sliding calliper

Measurement range mm	A mm	C mm	art.no.	€	DAkkS calibration art.no.	€
150	40	30	500701 2020	123,50	072008 D001	14,-

5108



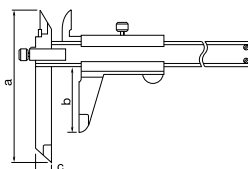
## Mitutoyo Digital special-purpose sliding calliper IP67



ABSOLUTE®



- **ABSOLUTE scale**
- Inductive functional principle
- Switches off automatically after 20 minutes of inactivity
- New, high-contrast display
- Digit height 9 mm
- Battery life approx. 5 years
- Battery change possible without a screwdriver
- **Functions:** ZERO/ORIGIN, automatic ON/OFF, battery check
- Supplied with SR44 battery, No. 500534 0001
- **Special accessories:** Digimatic cable type A No. 563100 0001 (1 m), No. 563100 0002 (2 m), USB cable type A-USB No. 563110 0001

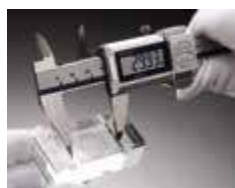
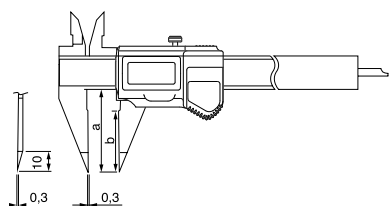


### With adjustable measuring jaws and depth bar

- 500730 0003 with digit height 10.2 mm, screwed battery cover and 5000-hour battery life

Measurement range mm	a mm	b mm	c mm	Error limit mm	Thumb roller	art.no.	€	DAkkS calibration art.no.	€
150	95	40	10	0.03	No	500730 0150	564,-	072008 D001	14,-
200	95	50	10	0.03	No	500730 0200	629,-	072008 D001	14,-
300	135	64	15	0.04	No	500730 0300	751,-	072008 D002	19,-

5102



### Pointed sliding calliper with depth bar

Measurement range mm	a mm	b mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150	40	0.3	0.03	500731 0150	442,-	072008 D001	14,-

5102

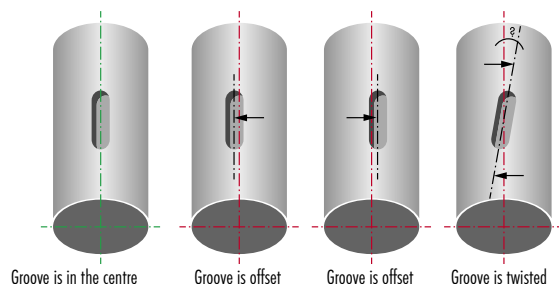


## Digital groove symmetry sliding calliper



- For checking the symmetry and position of, e.g. fitting key grooves quickly and easily
- Long measuring jaws for checking symmetry
- Duplicate cross points on one side for better support in the groove
- Travel of long measuring jaw, 70 mm
- Travel of cross points, 40 mm
- Supplied with 2x SR44 batteries, no. 500534 0001

Potential groove positions



Measurement range Ø mm	Error limit mm	art.no.	€
100	0.05	500701 0100	450,-

5169



**ATORN® Digital universal pocket sliding gauge set IP67**

- Measuring jaws with M2.5 mm threads for attaching special-purpose dial gauge contact points
- For internal and external measurements
- Jaw width 5 mm
- **KEEPTRONIC** electronics store the zero point, operating keys lock to prevent accidental alteration of the zero point. Battery life approx. 3 years
- Inductive, waterproof FPS measuring system (Fluid Protected Measuring System)
- **multiCOM** data output, can be used as USB, Digi-matic or RS-232
- **Functions:** ON/OFF, user-defined zeroing (RESET), mm/inch
- Supplied with 2x Ø 5 mm ball measuring inserts and Ø 4.8 mm flat surface, 50 mm setting piece, CR2032 battery, no. 548079 6032
- **Optional accessories:** Data cables, type P-RS 232 / P-Digi-matic / P-USB, no. 512521....

Measurement range mm	Edge length mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150	40	0.05	<b>500627 0150</b>	<b>470,-</b>	072008 D001	<b>14,-</b>

5194

**Data output  
multiCOM****ATORN® Digital universal workshop calliper set IP65**

- Measuring jaws with M 2.5 mm threads for attaching dial gauge special probe tips
- For internal and external measurements
- Side width: 300 mm = 12 mm, 500 mm = 16 mm
- **KEEPTRONIC** electronics store the 0-position, operating keys lock to prevent accidental alteration of the 0-position, battery life approx. 3 years
- LCD with 8.5 mm high digits for measurement range of 300 mm; 12 mm high for measurement range of 500 mm
- **multiCOM** data output, can be used as USB, Digi-matic or RS232
- **Functions:** mm/inch, ON/OFF / 0 / HOLD for power on/off / user-defined zeroing / hold value, measurement value preset
- Supplied in a wooden case **with 2 of each measuring insert:**  
pointed tip, steel, No. 5170301017; flat tip/HM, Ø 4.8 mm, No. 5170301025; ball tip, steel, Ø 3 mm  
No. 5170301020; cylindrical tip, flat, steel, length 11 mm, No. 5170301011
- **Special accessories:** Data cables, type P-RS 232 / P-Digi-matic / P-USB, No. 512521....

Measurement range outside/inside mm	Edge length mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
0-300 / 40-300	90	0.06	<b>500627 0301</b>	<b>829,-</b>	072008 D002	<b>19,-</b>
0-500 / 50-500	100	0.06	<b>500627 0501</b>	<b>1.049,-</b>	072008 D003	<b>31,-</b>

5194

**Data output  
multiCOM**Measuring inserts for external  
measurement, adjustable

## SARA® Universal accessory set for digital sliding callipers

0,01 mm



- Accessory set suitable for all digital pocket callipers with a measuring jaw thickness of max. 4.5 mm
- Supplied with:
  - 1 pair of measuring holders in each size, short and long
  - 1 pair of disc probes in each size, Ø 12.5 / 10 / 6 mm
  - 1 pair of 60° tapered probes in each size, Ø 12 / 9 mm
  - 1 pair of cylindrical probes in each size, Ø 1.5 x 9 mm
  - 1 spring system for constant measuring force
  - 1 hex key



Designation	art.no.	€
Universal accessory set for Vernier callipers up to jaw thickness 3.5 mm	500190 0008	195,50
Universal accessory set for Vernier callipers up to jaw thickness 4.5 mm	500190 0009	219,-



- Supplied with additional depth gauge bridge and digital sliding calliper, measurement range 150 mm, for technical data please see No. 500702 0150

Designation	art.no.	€	DAkkS calibration art.no.	€
Universal accessory set with digital vernier calliper	500190 0010	250,-	072008 D001	14,-

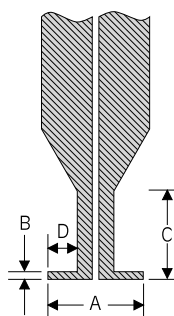


## Groove measuring attachments



- For measuring external and internal groove diameters, O-ring recesses and undercuts
- Attachments are fixed to the sliding calliper measuring jaws in pairs using clamping screws
- Hard chrome-plated
- Suitable for all sliding callipers with max. measuring jaw thickness of 3.5 mm
- Set of 5 pairs of attachments
  - 1 pair for external recesses
  - 4 pairs for internal recesses of various diameters
- Supplied without sliding calliper

Mode of measuring	B mm	A mm	D mm	C mm
external	0,65	-	9,5	-
internal	0,4	5,0	1,3	10
internal	0,4	7,5	1,75	16
internal	0,65	15,0	5,0	25
internal	1,0	18,0	6,5	32



Shown with vernier calliper



Designation	art.no.	€
Measuring attachment set	500190 0001	480,-

## SARA® Workshop sliding calliper

DIN 862

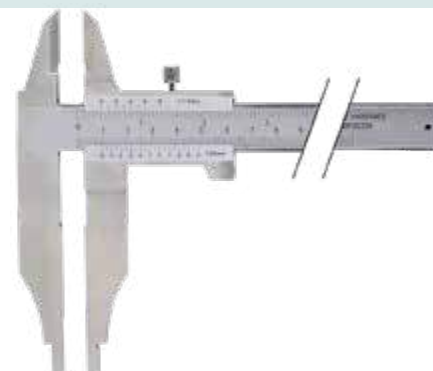


INOX



- With bevelled blade tips
- Offset jaw ends for internal measurements

Measurement range mm	Jaw length mm	Inside measurement from mm	Vernier mm/inch	art.no.	€	DAkkS calibration art.no.	€
300	90	10	0.05/1/128"	500612 0300	130,50	072008 D002	19,-
500	150	20	0.05/1/128"	500612 0500	355,-	072008 D003	31,-
800	150	20	0.05/1/128"	500612 0800	539,-	072008 D005	48,-



## ATORN® Workshop sliding calliper



- For external and internal measurements
- Error limit: factory standard
- High-precision laser scale
- Reading parts matt chrome-plated
- Ultra-fine ground and lapped measuring surfaces
- Measuring jaw ends offset for internal measurements
- Locking screw on top



Rounded measuring areas for internal measurement

### Without blade tips

Measurement range mm	Jaw length mm	Vernier mm/inch	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
300	90	0.05 / 1/128"	10	0.05	<b>500619 0300</b>	<b>203,-</b>	072008 D002	<b>19,-</b>
500	150	0.05 / -	20	0.07	500619 0500	<b>549,-</b>	072008 D003	<b>31,-</b>
800	150	0.05 / -	20	0.10	500619 0800	<b>699,-</b>	072008 D005	<b>48,-</b>

5190

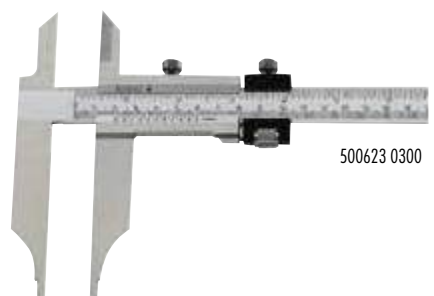


### With fine adjustment

- Bevelled blade tips

Measurement range mm	Jaw length mm	Vernier mm/inch	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
300	90	0.05/1/128"	10	0.05	<b>500623 0300</b>	<b>254,-</b>	072008 D002	<b>19,-</b>
500	150	0.05/-	20	0.07	500623 0500	<b>729,-</b>	072008 D003	<b>31,-</b>
800	150	0.05/-	20	0.10	500623 0800	<b>939,-</b>	072008 D005	<b>48,-</b>
1000	150	0.05/-	20	0.12	500623 1000	<b>1.119,-</b>	072008 D005	<b>48,-</b>
1500	200	0.05/-	30	0.18	500623 1500	<b>2.179,-</b>	072008 D006	<b>168,-</b>

5190



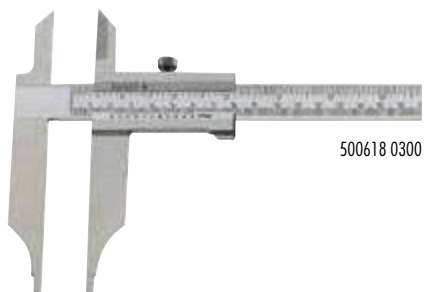
500623 0300

### Without fine adjustment

- Bevelled blade tips

Measurement range mm	Jaw length mm	Vernier mm/inch	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
300	90	0.05/1/128"	10	0.05	<b>500618 0300</b>	<b>219,-</b>	072008 D002	<b>19,-</b>
500	150	0.05/-	20	0.07	500618 0500	<b>649,-</b>	072008 D003	<b>31,-</b>
800	150	0.05/-	20	0.10	500618 0800	<b>859,-</b>	072008 D005	<b>48,-</b>
1000	150	0.05/-	20	0.12	500618 1000	<b>1.019,-</b>	072008 D005	<b>48,-</b>

5190



500618 0300

### Wooden case for calliper

suitable for measurement range mm	art.no.	€
300	<b>500624 0300</b>	<b>16,30</b>
500	500624 0500	<b>48,80</b>
800	500624 0800	<b>67,20</b>
1000	500624 1000	<b>89,50</b>
1500	500624 1500	<b>168,-</b>

5186



Non-rebound ...

... it's the tool.

**ATORN®**  
Performance demands quality





- For measuring large workpieces and workpiece diameters
- High-precision laser scale
- Vernier 0.05 mm and scale matt chrome-plated
- Offset jaw ends for internal measurements
- Locking screw on top
- Fine adjustment



Rounded measuring areas for internal measurement



Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration	
						art.no.	€
500	250	20	0.14	500622 0501	709,-	072008 D003	31,-
800	400	20	0.20	500622 0801	1.259,-	072008 D005	48,-
1000	200	20	0.24	500622 1001	1.039,-	072008 D005	48,-
1000	500	20	0.24	500622 1051	1.749,-	072008 D005	48,-

5186

## Mitutoyo Workshop sliding calliper



- Reading parts matt chrome-plated
- Measuring jaw ends offset for internal measurements
- Direct measurement readings due to offset metric scales for external and internal measurements, no need to add on the measuring jaw thickness

### With fine adjustment

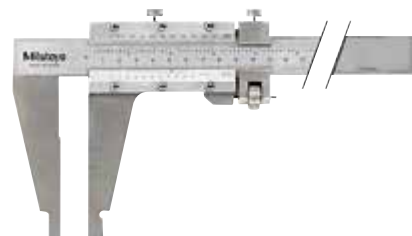
- Vernier scale 0.02 mm
- ...0300 with rounded Vernier scale for parallax-free readings

Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration	
						art.no.	€
300	75	10	0.04	500603 0300	354,-	072008 D002	19,-
450	100	20	0.05	500603 0450	564,-	072008 D003	31,-
600	100	20	0.05	500603 0600	642,-	072008 D003	31,-
1000	140	20	0.07	500603 1000	1.182,-	072008 D005	48,-
1500	180	20	0.09	500603 1500	2.416,-	072008 D006	168,-
2000	180	20	0.12	500603 2000	3.428,-	072008 D006	168,-

5102



Rounded measuring areas for internal measurement



## Mitutoyo Digital sliding calliper for large measurement ranges



- Robust design
- **ABSOLUTE scale**
- With cross points
- Capacitive measuring system with dirt wipers in the slider
- Battery life approx. 20,000 hours
- **Functions:** On/off, ORIGIN, ZERO/ABS, battery check
- Supplied with SR44 battery, no. 500534 0001
- **Optional accessories:** Digi-matic cable type C, no. 563100 0021 (1 m), no. 563100 0022 (2 m), USB cable type C-USB, no. 563110 0003

Measurement range mm	Jaw length mm	Error limit mm	art.no.	€	DAkkS calibration	
					art.no.	€
450	90	0.05	500703 0450	858,-	072008 D003	31,-
600	90	0.05	500703 0600	931,-	072008 D003	31,-
1000	130	0.07	500703 1000	1.616,-	072008 D005	48,-

5102

ABSOLUTE®



500703 0450



## SARA® Digital workshop calliper



- With blade tips
- With fine adjustment
- Offset jaw ends for internal measurements
- Bevelled blade tips
- Supplied with CR2032 battery, No. 548079 6032

Measurement range mm/inch	Jaw length mm	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
300	90	10	0.03	500628 0300	213,-	072008 D002	19,-
500	150	20	0.05	500628 0500	385,-	072008 D003	31,-
800	150	20	0.06	500628 0800	579,-	072008 D005	48,-
1000	150	20	0.06	500528 1000	789,-	072008 D005	48,-

5108



## HELIOS·PREISSER Digital workshop calliper IP65



- **QuickLock** electronics store the zero point, operating keys lock to prevent accidental alteration of the zero point
- Data output can be used as USB, Digi-matic or RS-232
- Digit height 12.5 mm (measurement range 300 mm = 10 mm)
- **Functions:** ON/OFF, user-defined zeroing (RESET), mm/inch, PRESET for pre-setting internal measurement values
- Supplied with CR 2032 battery, No. 548079 6032
- **Optional accessories:** data cables, type P-RS 232 / P-Digi-matic / P-USB, no. 512521....

### With blade tips

Measurement range mm	Jaw length mm	Inside measurement from mm	art.no.	€	DAkkS calibration art.no.	€
300	90	10	500531 0300	440,-	072008 D002	19,-
500	125	20	500531 0500	839,-	072008 D003	31,-
800	150	20	500531 0800	1.129,-	072008 D005	48,-
1000	150	20	500531 1000	1.389,-	072008 D005	48,-

5186



### Without blade tips

Measurement range mm	Jaw length mm	Inside measurement from mm	art.no.	€	DAkkS calibration art.no.	€
300	90	10	500533 0300	405,-	072008 D002	19,-
500	125	20	500533 0500	749,-	072008 D003	31,-
800	150	20	500533 0800	1.029,-	072008 D005	48,-
1000	150	20	500533 1000	1.289,-	072008 D005	48,-

5186



## ATORN® Digital workshop calliper



- **KEEPTRONIC** electronics store the zero point, operating keys lock to prevent accidental alteration of the zero point. Battery life approx. 3 years
- Data output **multiCOM** Can be used as USB, Digmatic or RS-232
- Digit height 12 mm (measurement range 300 mm = 10 mm)
- **Functions:** ON/OFF, user-defined zeroing (RESET), mm/inch, PRESET for pre-setting internal measurement values
- Supplied with CR 2032 battery, No. 548079 6032
- **Optional accessories:** data cables, type P-RS 232 / P-Digmatic / P-USB, no. 512521....

Data output multiCOM

### With blade tips, no fine adjustment

Measurement range mm	Jaw length mm	Inside measurement from mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
300	90	10	1.20	500521 0301	519,-	072008 D002	19,-
500	125	20	2.50	500521 0501	779,-	072008 D003	31,-
800	150	20	4.50	500521 0801	1.269,-	072008 D005	48,-
1000	150	20	4.75	500521 1001	1.449,-	072008 D005	48,-

5194

### With blade tips and fine adjustment

Measurement range mm	Jaw length mm	Inside measurement from mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
300	90	10	1.20	500523 0301	559,-	072008 D002	19,-
500	125	20	2.50	500523 0501	859,-	072008 D003	31,-
800	150	20	4.50	500523 0801	1.349,-	072008 D005	48,-
1000	150	20	4.75	500523 1001	1.539,-	072008 D005	48,-

5194

### Without blade tips, with fine adjustment

Measurement range mm	Jaw length mm	Inside measurement from mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
300	90	10	1.20	500526 0301	539,-	072008 D002	19,-
500	125	20	2.50	500526 0501	749,-	072008 D003	31,-
800	150	20	4.50	500526 0801	1.249,-	072008 D005	48,-
1000	150	20	4.75	500526 1001	1.459,-	072008 D005	48,-

5194

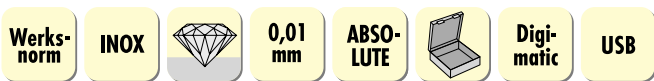
### Wooden case for calliper

suitable for measurement range mm	art.no.	€
300	500624 0300	16,30
500	500624 0500	48,80
800	500624 0800	67,20
1000	500624 1000	89,50

5186



## Mitutoyo Digital workshop calliper



- **ABSOLUTE** scale
- Measuring jaw ends offset for internal measurements
- Capacitive measuring system with dirt wipers in the slider
- Battery life approx. 20,000 hours
- **Functions:** ON/OFF, ORIGIN, ZERO/ABS, battery check
- Supplied with SR44 battery, no. 500534 0001
- **Optional accessories:** Digmatic cable type C, no. 563100 0021 (1 m), no. 563100 0002 (2 m), USB cable type C-USB, no. 563110 0003



Rounded measuring areas for internal measurement

### With blade tips

Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
500	150	20	0.06	500707 0501	809,-	072008 D003	31,-
750	150	20	0.06	500707 0751	1.110,-	072008 D004	34,-
1000	150	20	0.07	500707 1001	1.345,-	072008 D005	48,-

5102

### Without blade tips

Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
450	100	20	0.05	500705 0451	640,-	072008 D003	31,-
600	100	20	0.05	500705 0601	729,-	072008 D003	31,-
1000	140	20	0.07	500705 1001	1.234,-	072008 D005	48,-

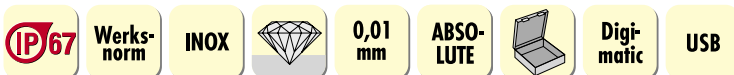
5102



500707 0501

500705 0451

## Mitutoyo Digital workshop calliper IP67



- **ABSOLUTE scale**
- Inductive functional principle
- Switches off automatically after 20 minutes of inactivity
- New, high-contrast display
- Digit height 9 mm (measurement range 300 mm = 10.2 mm)
- Battery life approx. 5 years (300 mm = 5000 hours)
- Battery can be changed without a screwdriver for measurement range 200 mm (Battery cover screwed for 300 mm)
- **Functions:** ZERO/ORIGIN, automatic ON/OFF, battery check
- Supplied with SR44 battery, No. 500534 0001
- **Special accessories:** Digimatic cable type A No. 563100 0001 (1 m), No. 563100 0002 (2 m), USB cable type A-USB No. 563110 0001

ABSOLUTE®

Sicherheit  
Staub- und  
wasserge-  
schütztwww.tuv.com  
ID 2011207400

### With blade tips

Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
200	60	10	0.03	500708 0201	388,-	072008 D001	14,-
300	90	10	0.04	500708 0310	503,-	072008 D002	19,-

5102



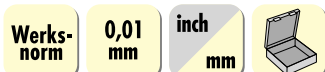
### Without blade tips

Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
200	60	10	0.03	500706 0201	355,-	072008 D001	14,-
300	75	10	0.04	500706 0310	464,-	072008 D002	19,-

5102



## SARA® Lightweight workshop sliding calliper



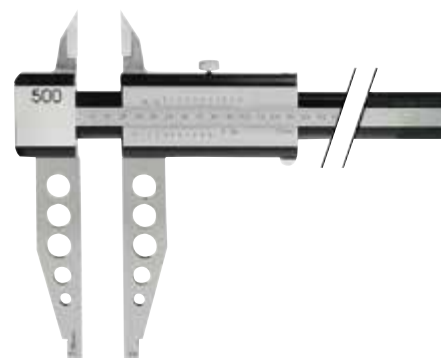
- With blade tips
- Aluminium bar and slider
- 1,100 HV wear-resistant and scratch-proof surface
- Double V-guide with perfect slider movement

### With parallax-free readings

- Offset scale for internal and external measurements, eliminating the need to add on the measuring jaw thickness

Measurement range mm	Jaw length mm	Vernier mm	Inside measurement from mm	Error limit mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
500	150	0.02	20	0.03	1.200	500625 0500	539,-	072008 D003	31,-
800	150	0.02	20	0.1	1.500	500625 0800	739,-	072008 D005	48,-
1000	150	0.02	20	0.1	1.650	500625 1000	859,-	072008 D005	48,-

5108



### With digital display, 0.01 mm readings

- Functions: mm/inch, ON/OFF
- Supplied with CR 2032 battery, No. 548079 6032

Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
500	150	20	0.03	1.200	500630 0500	749,-	072008 D003	31,-
800	150	20	0.08	1.500	500630 0800	969,-	072008 D005	48,-
1000	150	20	0.08	1.650	500630 1000	1.099,-	072008 D005	48,-

5108



## SARA® Lightweight digital workshop calliper



- Stainless steel measuring jaws, hardened and finely ground
- Both measuring jaws are adjustable
- Internal double V-guide for optimum guide properties and slider movement
- Aluminium rail with oxide coating
- Measurement ranges from 1,000 to 3,000 mm with Sylvac electronics
- Functions: On/off, mm/inch, user-defined zeroing
- Longer measuring jaws available on request
- Supplied with plastic case up to 1000 mm, in carry case from 1500 mm including battery:  
500632.... SR44 battery, no. 500534 0001  
500633.... CR2032 battery, no. 548079 6032



Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	Weight kg	art.no.	€	Factory calibration art.no.	€	DAkkS calibration art.no.	€
300	90	10	0.04	0.50	500632 0300	248,-			072008 D002	19,-
500	90	10	0.05	0.60	500632 0500	420,-			072008 D003	31,-
800	90	10	0.06	0.73	500632 0800	579,-			072008 D005	48,-
1000	150	20	0.06	1.70	500633 1000	1.039,-			072008 D005	48,-
1500	150	20	0.10	2.00	500633 1500	1.549,-			072008 D006	168,-
2000	150	20	0.13	2.40	500633 2000	1.919,-			072008 D006	168,-
3000	150	20	0.25	3.40	500633 3000	3.199,-	072008 W901	238,-		

5108

### Wooden case for calliper

suitable for measurement range mm	art.no.	€
1500	500636 1500	321,-
2000	500636 2000	321,-
2500	500636 2500	380,-
3000	500636 3000	380,-

5108

## Mitutoyo Lightweight digital workshop calliper



- Lightweight carbon design, up to 50% lighter than conventional workshop callipers
- Inductive measuring system housed in the measuring bar for added protection
- Easy to read thanks to 10 mm high digits
- **ABSOLUTE scale**
- Drive slide for constant measuring force
- Adjustable fixed measuring jaw
- Battery life approx. 5,000 hours
- **Functions:**  
OFFSET for switching between internal and external measurements  
PRESET/ORIGIN for pre-setting/zero point  
ZERO/ABS/HOLD
- Supplied with SR44 battery, no. 500534 0001
- **Optional accessories:** Digi-matic cable type A, no. 563100 0001 (1 m), no. 563100 0002 (2 m); USB cable type A-USB, no. 563110 0001
- Version with long measuring jaws (200 mm) available on request

ABSOLUTE®



Sicherheit  
Staub- und  
wasserge-  
schützt  
www.tuv.com  
ID 000022582



Rounded measuring areas for internal measurement



Measurement range mm	Jaw length mm	Inside measurement from mm	Error limit mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
450	100	20	0.05	0.715	500712 0450	994,-	072008 D003	31,-
600	100	20	0.05	0.790	500712 0600	1.099,-	072008 D003	31,-
1000	150	20	0.06	1.760	500712 1000	1.605,-	072008 D005	48,-
1500	150	20	0.10	2.160	500712 1500	2.044,-	072008 D006	168,-
2000	150	20	0.13	2.560	500712 2000	2.610,-	072008 D006	168,-

5102

## ATORN® Sliding depth gauges

DIN  
862

INOX



### • With and without hook

- Open slider machined from solid material
- Scale end with step
- **501408.... Rail can be repositioned, engraved on both sides**
- Vernier: 0.05 mm extended to 39 mm

Measurement range mm	Base length mm	Scale cross-section mm	Without hook		With hook		DAkkS calibration	
			art.no.	€	art.no.	€	art.no.	€
150	100	8x3	<b>501406 0150</b>	102,-	<b>501408 0150</b>	127,50	072008 D001	14,-
200	100	8x3	501406 0200	105,-	501408 0200	132,50	072008 D001	14,-
300	150	12x4	501406 0300	142,-	501408 0300	155,50	072008 D002	19,-
500	150	12x4	501406 0500	207,-	501408 0500	250,-	072008 D003	31,-
500	250	20x5	501406 0550	310,-	501408 0550	509,-	072008 D003	31,-
			5195		5195			



501406 0150



501408 0200



### Wooden case for calliper

suitable for measurement range mm	art.no.	€
150 and 200	<b>500624 0200</b>	9,40
300	500624 0300	16,30
500	500624 0500	48,80

5186

## Mitutoyo Sliding depth gauges

DIN  
862

INOX



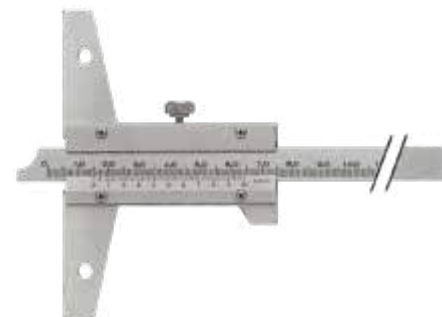
- Reading parts matt chrome-plated
- Slider can be re-adjusted in the guide
- Precision-lapped measuring faces
- Measuring bridge for measurement ranges up to 300 mm, with bores for attaching larger additional bridges (no. 501701....)

### Without fine adjustment

- Vernier scale 0.05 mm extended to 39 mm

Measurement range mm	Base length mm	Additional base possible			DAkkS calibration	
			art.no.	€	art.no.	€
150	100	Yes	<b>501501 0150</b>	119,-	072008 D001	14,-
200	100	Yes	501501 0200	130,-	072008 D001	14,-
300	100	Yes	501501 0300	175,-	072008 D002	19,-
600	250	No	501501 0600	708,-	072008 D003	31,-
1000	250	No	501501 1000	764,-	072008 D005	48,-

5102



THE **BENCHMARK**  
STANDARD

Mitutoyo



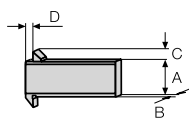
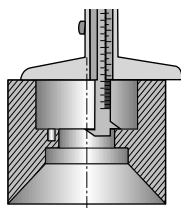
MITUTOYO  
Measuring equipment  
catalogue  
approx. 620 pages  
Art.no. 019900 0069

Overview of all free manufacturers' catalogues  
on page 16/17

## SARA® Digital sliding depth gauge with offset double hook



- **Convertible measuring bar**
- Scales on both sides
- Precision-ground measuring faces
- Vernier scale and reading parts matt chrome-plated
- Error margin in accordance with DIN 862
- Vernier scale 0.05 mm



Measurement range mm	Base length mm	A mm	B mm	C mm	D mm	art.no.	€	DAkkS calibration art.no.	€
200	100	8	3	6	4	501442 0200	121,-	072008 D001	14,-
300	100	8	3	6	4	501442 0300	157,50	072008 D002	19,-

5114

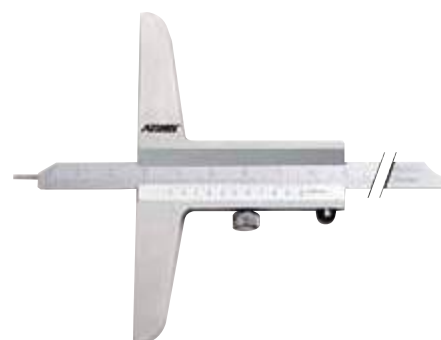
## ATORN® Sliding depth gauge with steel pin



- For measuring small bores
- Steel pin  $\varnothing$  1.5 mm
- High-precision laser scale
- Reading parts matt chrome-plated
- Convertible measuring bar, scales on both sides (except 501441 0080)
- Vernier scale 0.05 mm

Measurement range mm	Base length mm	Scale cross-section mm	art.no.	€	DAkkS calibration art.no.	€
150	100	8 x 3	501441 0150	138,50	072008 D001	14,-
200	100	8 x 3	501441 0200	140,50	072008 D001	14,-
300	150	12 x 4	501441 0300	188,50	072008 D002	19,-

5195



## SARA® Digital sliding depth gauge



- Locking screw on top
- **Functions:** ON/OFF, ZERO, inch/mm
- Supplied with SR44 battery, no. 500534 0001

Measurement range mm/inch	Base length mm	art.no.	€	DAkkS calibration art.no.	€
150/6"	100	501440 0150	159,50	072008 D001	14,-
300/12"	100	501440 0300	209,-	072008 D002	19,-

5108





## ATORN® IP67 digital sliding depth gauge



- With and without measuring hook
- Precision-ground measuring faces
- **KEEPTRONIC** electronics store the zero point, operating keys lock to prevent accidental alteration of the zero point. Battery life approx. 3 years
- Inductive, waterproof FPS measuring system (Fluid Protected Measuring System)
- **multiCOM** data output, can be used as USB, Digimatic or RS-232
- **Functions:**  
0/O/N/OFF, mm/inch, PRESET for pre-setting user-defined values
- Supplied with CR 2032 battery, No. 548079 6032
- **Optional accessories:** Data cables, type P-RS 232 / P-Digimatic / P-USB, no. 512521....

Measurement range mm	Base length mm	Measuring hook	art.no.		€		DAkkS calibration	
							art.no.	€
200	100	No	501610 0201		430,-		072008 D001	14,-
300	150	No	501610 0301		495,-		072008 D002	19,-
300	150	Yes	501610 1301		559,-		072008 D002	19,-
500	150	No	501610 0501		599,-		072008 D003	31,-

5196



## Mitutoyo ABSOLUTE! digital sliding depth gauge AOS!



- Particularly suitable for use in rough work conditions due to the electromagnetic inductive **AOS** measuring process (**A**dvanced **O**n-site **S**ensor), which is not sensitive to dirt or moisture on the scale
- **ABSOLUTE** scale for one-time zeroing
- **High-contrast LCD with 9 mm high digits**
- Battery life approx. 18,000 hours
- **Functions:** ON/OFF, zero point at battery change (ORIGIN), user-defined zeroing (ZERO/ABS), battery check
- Supplied with SR44 battery, No. 500534 0001
- **Special accessories:** Digimatic cable type C No. 563100 0021 (1 m), No. 563100 0022 (2 m), USB cable type C USB No. 563110 0003

Measurement range mm	Base length mm	Additional base possible	Error limit mm	art.no.		€		DAkkS calibration	
								art.no.	€
150	100	Yes	0.03	501602 0150		343,-		072008 D001	14,-
200	100	Yes	0.03	501602 0200		412,-		072008 D001	14,-

5102



## Mitutoyo Digital sliding depth gauge



- **ABSOLUTE scale**
- Capacitive measuring system with dirt wiper in the slider
- LCD display with 9 mm high digits
- Battery life: 20,000 hrs.
- Up to size O300: Measuring bridge with bores for attaching larger additional bridges
- **Functions:** ON/OFF, zero point at battery change (ORIGIN), (ZERO/ABS), battery check
- Supplied with SR44 battery, no. 500534 0001
- **Optional accessories:** Digimatic cable type C, no. 563100 0021 (1 m), no. 563100 0022 (2 m), USB cable type C-USB, no. 563110 0003

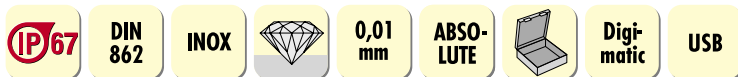
Measurement range mm	Base length mm	Additional base possible	Error limit mm	art.no.		€		DAkkS calibration	
								art.no.	€
300	100	Yes	0.04	501601 0301		420,-		072008 D002	19,-
450	250	No	0.05	501601 0450		863,-		072008 D003	31,-
600	250	No	0.05	501601 0600		917,-		072008 D003	31,-
750	250	No	0.06	501601 0750		989,-		072008 D004	34,-
1000	250	No	0.07	501601 1000		1.090,-		072008 D005	48,-

5102





## Mitutoyo IP67 digital sliding depth gauge

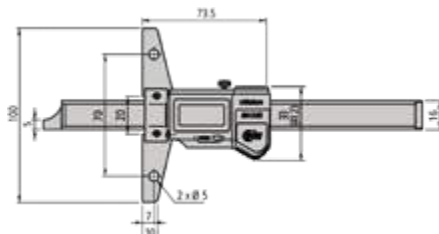


ABSOLUTE®



Sicherheit  
Staub- und  
wasserge-  
schützt  
www.tuv.com  
ID 2011207400

- **ABSOLUTE scale**
- Inductive functional principle
- Switches off automatically after 20 minutes of inactivity
- New, high-contrast display
- Digit height 9 mm
- Battery life approx. 5 years
- Battery change possible without a screwdriver
- **Functions:** ZERO/ORIGIN, automatic ON/OFF, battery check
- Supplied with SR44 battery, No. 500534 0001
- **Special accessories:** Digimatic cable type A No. 563100 0001 (1 m), No. 563100 0002 (2 m), USB cable type A-USB No. 563110 0001

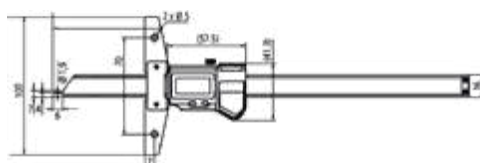


### Standard version

- 5016050300 battery service life 5000 hours, display 10.2 mm, screwed battery cover

Measurement range mm	Base length mm	Additional base possible	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150	100	Yes	0.03	501605 0151	388,-	072008 D001	14,-
200	100	Yes	0.03	501605 0201	451,-	072008 D001	14,-
300	100	Yes	0.04	501605 0301	503,-	072008 D002	19,-

5102



### With steel measuring pin, Ø 1.9 mm

Measurement range mm	Base length mm	Additional base possible	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150	100	Yes	0.03	501607 0151	462,-	072008 D001	14,-
200	100	Yes	0.03	501607 0201	520,-	072008 D001	14,-

5102



## Digital sliding depth gauge IP67 with steel measuring pin, wireless

NEW



integrated radio

- Pin gauge Ø 1.5mm
- inductive measurement system
- Digit height 11 mm
- compatible with the radio system **ATORN-Integrated-Wireless**
- **Function:** On/Off, mm/inch, PRESET (user-defined values), button lock, integrated radio transmitter

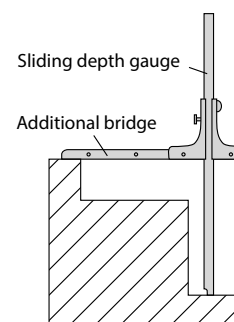
Measurement range mm	Base length mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
150	100	0.03	501715 0150	440,-	072008 D001	14,-
200	100	0.03	501715 0200	470,-	072008 D001	14,-

5186



## Mitutoyo Additional bridges for sliding depth gauges

- Screwing additional bridges onto the rear side of a standard measuring bridge allows the support length to be extended by 320 mm.
- Asymmetric assembly possible
- Should be adjusted on a measuring plate.
- Suitable for MITUTOYO sliding depth gauges up to a bridge length of 100 mm
- Supplied with fastening screws



L mm	art.no.	€	Factory calibration art.no.	€
180	501701 0180	58,-	073103 W143	14,-
260	501701 0260	79,-	073103 W144	14,-
320	501701 0320	90,-	073103 W144	14,-

5102

## SARA® Digital small sliding depth gauge



- Compact, handy depth gauge for measurements such as blind bores, tyre profiles or brake lining thicknesses
- Effortless to read thanks to a large display
- Supplied with CR 2032 battery, No. 548079 6032



Measurement range mm	Measuring bar Ø mm	Base length mm	art.no.	€	DAkkS calibration art.no.	€
25	1.5	50	501604 0025	57,20	072008 D001	14,-

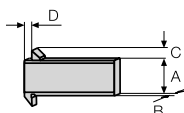
5108

## ATORN® IP67 digital sliding depth gauge with offset double hook



- **KEEPTRONIC** electronics store the 0-point, operating keys lock to prevent accidental alteration of the 0-point, battery life approx. 3 years
- Inductive, waterproof FPS measuring system (Fluid Protected Measuring System)
- **multiCOM** data output, can be used as USB, Digi-matic or RS232
- Error margin in accordance with factory standard
- **Function:** 0 / ON/OFF, mm / inch
- Supplied with battery CR 2032, No. 548079 6032
- **Special accessories:** Data cables, type P-RS 232 / P-Digi-matic / P-USB, No. 512521....

**Data output multiCOM**



Measurement range mm	Base length mm	A mm	B mm	C mm	D mm	art.no.	€	DAkkS calibration art.no.	€
300	150	12	4	6	4	501451 1301	679,-	072008 D002	19,-

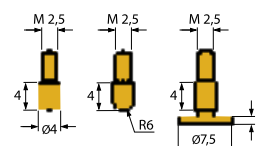
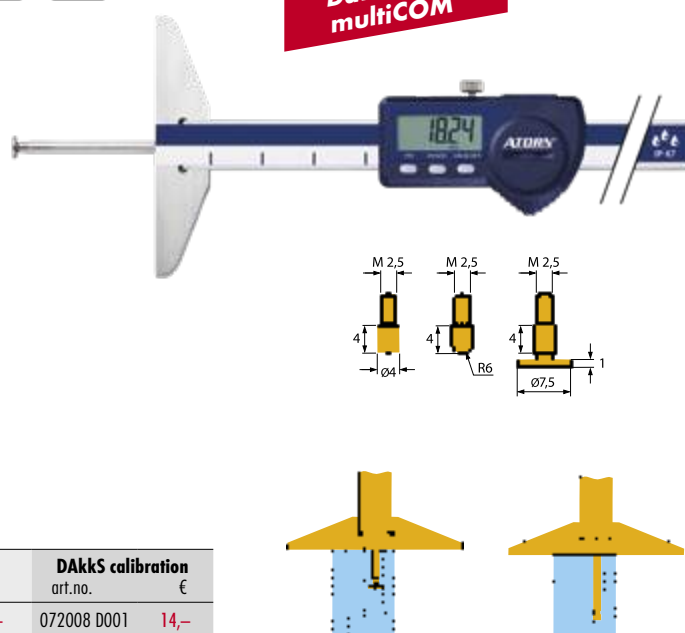
5196

## ATORN® IP67 digital sliding depth gauge with measuring inserts



- Particularly suitable for measuring recesses in bore holes
- With replaceable M2.5 inserts
- **KEEPTRONIC** electronics store the zero point, operating keys lock to prevent accidental alteration of the zero point. Battery life approx. 3 years
- Inductive, waterproof FPS measuring system (Fluid Protected Measuring System)
- **multiCOM** data output, can be used as USB, Digi-matic or RS-232
- Functions: mm/inch, ON/OFF/O/PRESET for pre-setting measurement values
- Supplied with 3 measuring inserts
  - 1x measuring disc, Ø 7.5 x 1 mm
  - 1x carbide insert, Ø 4 mm, flat
  - 1x carbide insert, R 6 mm
- CR2032 battery (no. 548079 6032) included
- **Optional accessories:** Data cables, type P-RS 232 C / P-Digi-matic / P-USB, no. 512521....

**Data output multiCOM**



Measurement range mm	Base length mm	art.no.	€	DAkkS calibration art.no.	€
100	85	501500 0101	589,-	072008 D001	14,-

5196

## SARA® Lightweight digital sliding depth gauge with measuring inserts



- Particularly suitable for measuring recesses and shoulders in bore holes
- With replaceable measuring inserts, M2.5 mm
- Internal double V-guide for optimum guide properties and slider movement
- Aluminium rail with oxide coating
- Supplied with 150 / 350 mm measuring bridges, 550 / 750 / 950 mm measuring bridges available on request
- Supplied with ball / disc measuring inserts, 150 / 350 mm measuring bridges and SR44 battery, no. 500534 0001



501498 0200

Measurement range mm	Base length mm	Measuring bar Ø mm	Plate measurement face Ø mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
100	150/350	4	10	0.03	501498 0100	370,-	072008 D001	14,-
200	150/350	4	10	0.03	501498 0200	399,-	072008 D001	14,-
300	150/350	4	10	0.04	501498 0300	529,-	072008 D002	19,-
500	150/350	6	20	0.05	501498 0500	669,-	072008 D003	31,-
800	150/350	6	20	0.06	501498 0800	849,-	072008 D005	48,-
950	150/350	6	20	0.06	501498 0950	1.189,-	072008 D005	48,-

5108

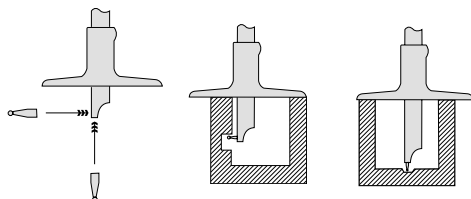


501498 0200

## SARA® Lightweight digital universal depth gauge



- Flexible depth gauges for a variety of measurement tasks
- Replaceable measuring inserts (M 2.5) can also be screwed in at a 90° offset angle
- With 3 replaceable measuring bridges, 150 / 300 / 450 mm, hard-anodised aluminium
- Easy-to-change measuring bridges
- Internal double V-guide for optimum guide properties and slider movement
- Supplied with standard measuring head with ball measuring insert, 3 measuring bridges and SR44 battery, No. 500534 0001



501475 0300

Measurement range mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
300	0.04	501475 0300	355,-	072008 D002	19,-
500	0.05	501475 0500	475,-	072008 D003	31,-
800	0.06	501475 0800	599,-	072008 D005	48,-

5108



501475 0300

## SARA® Measuring tool sets, analogue



- **3 pcs. set**, in a plastic case, contents:
  - 1 outside micrometer, 0 - 25 mm, 0.01 mm readings
  - 1 sliding calliper, 150 mm, Vernier 0.05mm / 1/128 inch
  - 1 bevel edge, 100 x 70 mm, stainless steel, DIN 875/00
- **7 pcs. set**, in a plastic case, contents:
  - 1 outside micrometer, 0 - 25 mm, 0.01 mm readings
  - 1 sliding calliper, 150 mm, Vernier 0.05mm / 1/128 inch
  - 1 straightedge 100 mm, stainless steel, DIN 874
  - 1 bevel edge, 100 x 70 mm, stainless steel, DIN 875/00
  - 1 spring-loaded divider, 125 mm
  - 1 flexible steel ruler, 200 mm, stainless steel
  - 1 carbide scriber, 150 mm, with fixed tip



502101 0103

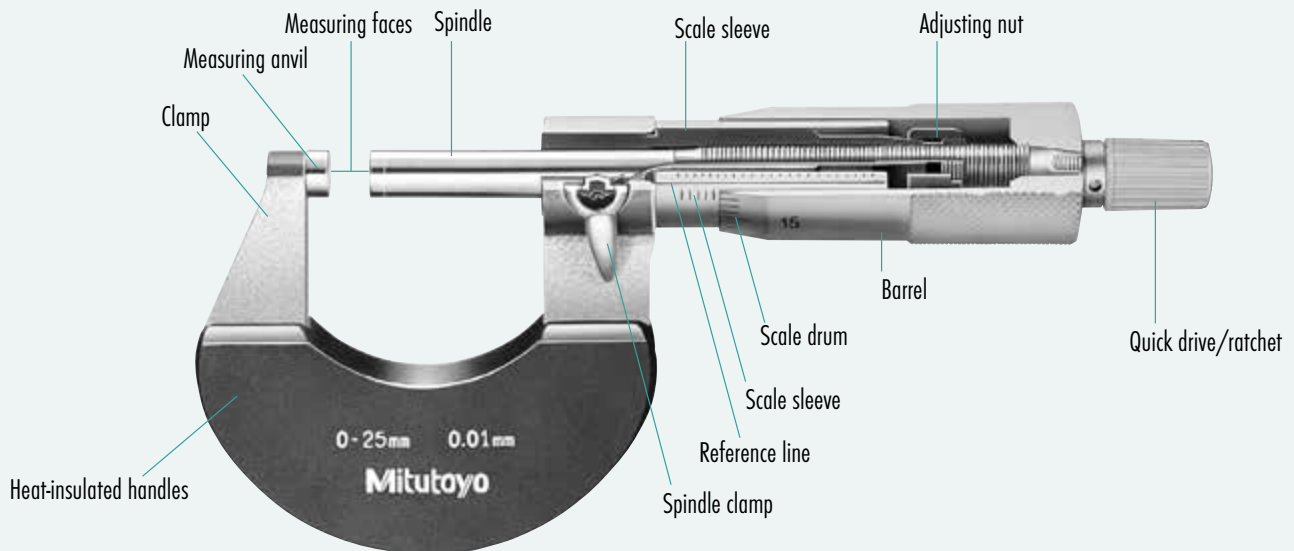


502101 0107

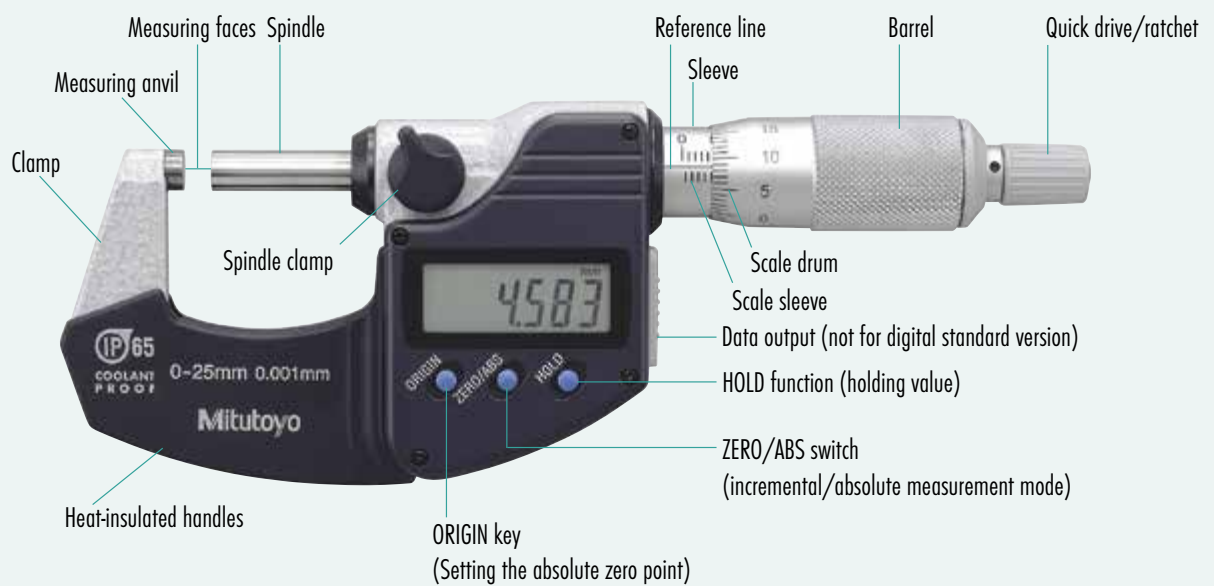
Description	art.no.	€	DAkkS calibration art.no.	€
3-pcs. set	502101 0103	101,-	073103 D020	64,-
7-pcs. set	502101 0107	168,-	073103 D021	92,-

5114

## Analog outside micrometer



## Digimatic outside micrometer



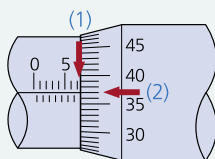
## Outside micrometers

INFO

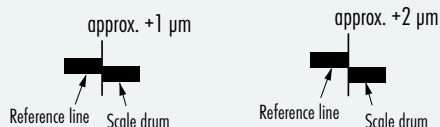
### Reading off the scale

Outside micrometer with scale division 0.01 mm

- (1) Reading off the scale sleeve 7.00 mm
  - (2) Reading off the scale drum + 0.37 mm
- Total reading 7.37 mm



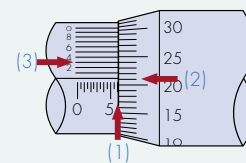
Note: 0.37 mm (2) is read on the position at which the reference line of the sleeve is aligned with the scale divisions of the drum.



The graduation of the drum can be read directly at intervals of 0.01 mm, as listed above. However, it can also be estimated at intervals of 0.001 mm, if the lines lie closely above each other, as the thickness of the lines is one-fifth of the distance between the said lines.

Outside micrometer with Vernier scale (scale division of 0.001 mm)

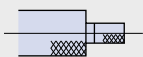
The Vernier scale lying above the reference line of the sleeve allows a direct reading in values to 0.001 mm.



- (1) Reading off the scale sleeve 6.000 mm
  - (2) Reading off the scale drum 0.210 mm
  - (3) Read off the markings of the Vernier scale and the graduation lines of the drum + 0.003 mm
- Total reading 6.213 mm

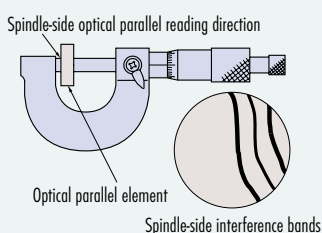
Note: 0.21 mm (2) is read off at the position at which the reference line lies between two graduation marks (21 and 22 in this case). The 0.003 mm reading (3) is taken at the position at which one of the Vernier graduation marks is in line with one of the drum graduations.

### Measuring force limitation

	Audible	Single-handed operation	Note!
Ratchet stop 	yes	unsuitable	audible clicking causes micro-vibrations
Friction thimble (F type) 	no	suitable	noiseless and vibration-free operation due to friction clutch
Ratchet barrel (T type) 	yes	suitable	the constant measuring force is achieved through the acoustic feedback of the ratchet function.
Ratchet barrel 	yes	suitable	The constant measuring force is achieved through the acoustic feedback of the ratchet function.

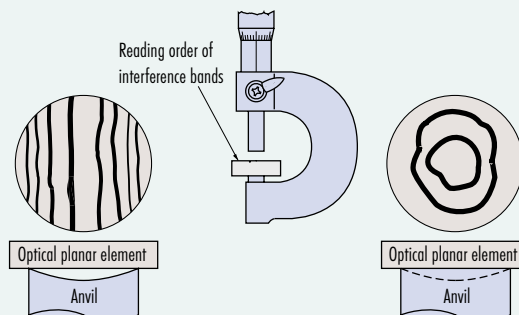
### The parallelism check of the measuring faces

The parallelism can be checked with a plane-parallel test glass held between the measuring faces. First, the test tube is attached to the measuring face of the anvil. The test tube is then clamped by closing the spindle with normal measuring force and the number of red interference rings or stripes that are visible under white light on the measuring face of the spindle are counted. Each interference ring/stripe is equivalent to a half-wavelength difference (0.32 μm for red stripes). In the above picture a parallelism of approximately 1 μm is achieved, from 0.32 μm x 3 = 0.96 μm.



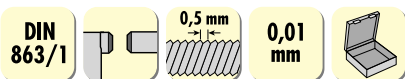
### Flatness check of the measuring faces

The flatness can be estimated by holding an optical flat against the measuring face. A visible number of red interference rings or stripes can then be counted on the measuring face under white light. Each interference ring/stripe represents a half-wavelength difference in height (0.32 μm).



The measuring face is curved by about 1.3 μm. (0.32 μm x 4 paired red stripes.)

The measuring face is deeply concave (or convex) by about 0.6 μm. (0.32 μm x 2 continuous stripes)

**SARA® Outside micrometer**

- Precision design with ratchet
- Frame with hand protection
- Spindle fixed by means of a locking lever
- Reading parts matt chrome-plated
- Scale barrel Ø: 17 mm
- Spindle Ø: 6.35 mm
- Calibration includes setting gauge
- Supplied with adjustment key, versions over 25 mm include setting gauge



502505 0025

**Individual**

Measurement range mm	art.no.	€	DAkkS calibration	
			art.no.	€
0-25	<b>502505</b> 0025	<b>21,-</b>	070160 D001	<b>18,-</b>
25-50	502505 0050	<b>27,90</b>	073103 D047	<b>33,-</b>
50-75	502505 0075	<b>37,80</b>	073103 D052	<b>36,-</b>
75-100	502505 0100	<b>45,40</b>	073103 D052	<b>36,-</b>
100-125	502505 0125	<b>75,80</b>	073103 D048	<b>45,-</b>
125-150	502505 0150	<b>91,10</b>	073103 D049	<b>50,-</b>

5116



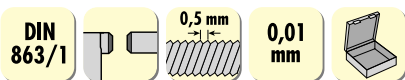
502506 0075

**Sets**

Measurement range mm	Contents	art.no.	€	DAkkS calibration	
				art.no.	€
0-75	3 outside micrometers and 2 setting gauges	<b>502506</b> 0075	<b>95,60</b>	073103 D034	<b>84,-</b>
0-100	4 outside micrometers and 3 setting gauges	502506 0100	<b>129,50</b>	073103 D041	<b>120,-</b>
0-150	6 outside micrometers and 5 setting gauges	502506 0150	<b>284,-</b>	073103 D045	<b>215,-</b>

5116

502506 0150

**ATORN® Outside micrometer**

- Precision design with advanced friction coupling (ratchet stop)
- Steel clamp
- Spindle fixed by means of a locking lever
- Reading parts matt chrome-plated
- Spindle Ø: 6.5 mm
- Calibration includes setting gauge
- Versions over 25 mm supplied with setting gauge

**Individual**

Measurement range mm	art.no.	€	DAkkS calibration	
			art.no.	€
0-25	<b>502510</b> 0025	<b>44,-</b>	070160 D001	<b>18,-</b>
25-50	502510 0050	<b>67,20</b>	073103 D047	<b>33,-</b>
50-75	502510 0075	<b>78,40</b>	073103 D052	<b>36,-</b>
75-100	502510 0100	<b>89,50</b>	073103 D052	<b>36,-</b>

5191

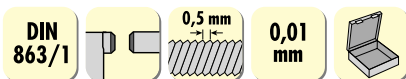
**Set**

Measurement range mm	Contents	art.no.	€	DAkkS calibration	
				art.no.	€
0-100	4 outside micrometers and 3 setting gauges	<b>502511</b> 0100	<b>265,-</b>	073103 D041	<b>120,-</b>

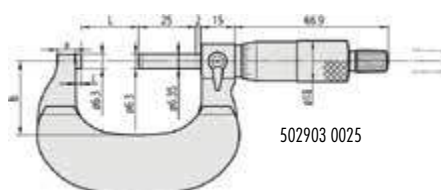
5191



## Mitutoyo Outside micrometer



- Sturdy, with ratchet
- Steel frame with hand protection
- Spindle fixed by means of a locking lever
- Reading parts matt chrome-plated
- Spindle Ø: 6.35 mm
- Measuring force: 5 - 10 N
- Calibration includes setting gauges
- Supplied with adjustment key; versions with measurement range over 25 mm also include setting gauge; versions up to 50 mm include factory certificate



502903 0025

**With factory certificate for measurement ranges up to 50 mm!**



502903 0025

### Individual

- Scale barrel Ø 17 mm

Measurement range mm	art.no.	€	DAkkS calibration art.no.	€
0-25	502903 0025	55,-	070160 D001	18,-
25-50	502903 0050	81,-	073103 D047	33,-
50-75	502903 1075	105,-	073103 D052	36,-
75-100	502903 0110	123,-	073103 D052	36,-

5102



### Individual, with ratchet barrel

- A new and exceptionally smooth-running ratchet mechanism provides a constant measuring force that enables quick and safe one-handed operation due to the ratchet design of both the measuring barrel and quick adjustment
- Scale barrel Ø 19 mm

Measurement range mm	Reading mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
0-25	0.01	0.003	502908 0025	60,-	070160 D001	18,-
0-25	0.001	0.003	502908 1025	83,-	070160 D001	18,-
25-50	0.01	0.003	502908 0050	91,-	073103 D047	33,-
25-50	0.001	0.003	502908 1050	134,-	073103 D047	33,-

5102



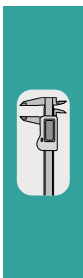
502908 1025

### Set

- 1 each of 5029080025 (with ratchet barrel), 5029030050, 5029031075 and 5029030110

Measurement range mm	Reading mm	art.no.	€	DAkkS calibration art.no.	€
0-100	0.01	502921 1100	350,-	073103 D041	120,-

5102





## Mitutoyo Outside micrometer designed for workshop use



- Lightweight workshop version with ratchet
- Painted steel frame (with bores to reduce weight for larger measurement ranges)
- Spindle fixed by means of a locking lever
- Reading parts matt chrome-plated
- Scale barrel Ø up to 300 mm = 18 mm, above 300 mm = 21 mm
- Spindle Ø up to 300 mm = 6.35 mm, above 300 mm = 8 mm
- Calibration includes setting gauges
- Supplied with adjustment key, versions with measurement ranges over 25 mm include setting gauge and versions up to 50 mm include factory certificate

**With factory certificate  
for measurement ranges  
up to 50 mm!**



502911 0150

### Individual

Measurement range mm	Error limit µm	Measuring force N	art.no.	€	Factory calibration		DAkkS calibration	
					art.no.	€	art.no.	€
0-25	2	5-10	<b>502911 0025</b>	49,-			070160 D001	18,-
25-50	2	5-10	502911 0050	70,-			073103 D047	33,-
50-75	2	5-10	502911 0075	92,-			073103 D052	36,-
75-100	3	5-10	502911 0100	100,-			073103 D052	36,-
100-125	3	5-15	502911 0125	156,-			073103 D048	45,-
125-150	3	5-15	502911 0150	174,-			073103 D049	50,-
150-175	4	5-15	502911 0175	193,-			073103 D049	50,-
175-200	4	5-15	502911 0200	211,-			073103 D049	50,-
200-225	4	5-15	502911 0225	235,-			073103 D049	50,-
225-250	5	5-15	502911 0250	261,-			073103 D050	58,-
250-275	5	5-15	502911 0275	274,-			073103 D050	58,-
275-300	5	5-15	502911 0300	293,-			073103 D050	58,-
300-325	6	5-15	502911 0325	372,-			073103 D060	63,-
325-350	6	5-15	502911 0350	402,-			073103 D154	70,-
350-375	6	5-15	502911 0375	435,-			073103 D154	70,-
375-400	7	5-15	502911 0400	467,-			073103 D154	70,-
400-425	7	5-15	502911 0425	501,-			073103 D154	70,-
425-450	7	5-15	502911 0450	536,-			073103 D354	84,-
450-475	8	5-15	502911 0475	569,-			073103 D354	84,-
475-500	8	5-15	502911 0500	614,-			073103 D354	84,-
500-525	8	5-15	502911 0525	688,-			073103 D455	192,-
525-550	8	5-15	502911 0550	716,-	073103 W256	216,-		
550-575	9	5-15	502911 0575	758,-	073103 W256	216,-		
575-600	9	5-15	502911 0600	789,-	073103 W256	216,-		

5102

### Sets

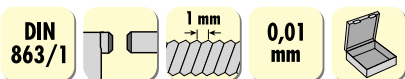
Measurement range mm	Contents	art.no.	€	DAkkS calibration	
				art.no.	€
0-75	3 outside micrometers and 2 setting gauges	<b>502923 0075</b>	249,-	073103 D034	84,-
0-150	6 outside micrometers and 5 setting gauges	502923 0150	503,-	073103 D045	215,-
0-300	12 outside micrometers and 11 setting gauges	502923 0300	1.968,-	073103 D030	539,-
150-300	6 outside micrometers and 6 setting gauges	502923 1300	1.270,-	073103 D046	324,-

5102



502923 0150

## SARA® Outside micrometer, robust design



- Large scale barrel with 100th divisions, Ø 28 mm
- With ratchet stop
- Spindle Ø 8 mm
- Spindle fixed by means of a locking lever
- Steel frame with hand protection
- Reading parts matt chrome-plated
- Measuring force 5 - 10 N
- Calibration includes setting gauges
- Supplied with adjustment key, versions over 25 mm include setting gauge



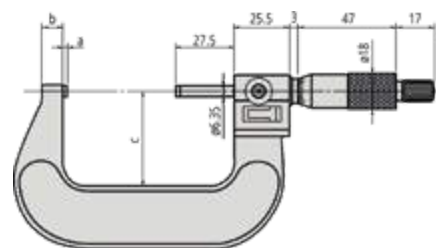
Measurement range mm	art.no.	€	DAkkS calibration	
			art.no.	€
0-25	<b>503504 0025</b>	<b>89,10</b>	070160 D001	<b>18,-</b>
25-50	503504 0050	<b>116,50</b>	073103 D047	<b>33,-</b>
50-75	503504 0075	<b>134,-</b>	073103 D052	<b>36,-</b>
75-100	503504 0100	<b>149,-</b>	073103 D052	<b>36,-</b>

5116

## Mitutoyo Outside micrometer with counting mechanism



- Painted steel frame with hand protection
- Spindle fixed by means of a locking screw
- Scale barrel and scale sleeve matt chrome-plated
- Scale barrel Ø 18 mm
- Spindle Ø 6.35 mm
- Calibration includes setting gauge
- Supplied with adjustment key, versions with measurement ranges over 25 mm include setting gauge



Measurement range mm	a mm	b mm	c mm	Error limit mm	art.no.	€	DAkkS calibration	
							art.no.	€
0-25	2.5	5	26	0.003	<b>503101 0025</b>	<b>129,-</b>	070160 D001	<b>18,-</b>
25-50	2	8	32	0.003	503101 0050	<b>195,-</b>	073103 D047	<b>33,-</b>
50-75	2	9	45	0.003	503101 0075	<b>245,-</b>	073103 D052	<b>36,-</b>
75-100	2	9	57	0.004	503101 0100	<b>268,-</b>	073103 D052	<b>36,-</b>

5102

## SARA® Digital outside micrometer



- robust with ratchet
- painted steel frame with hand guard
- spindle fixed by means of a locking lever
- spindle Ø 6.5mm
- calibration including setting gauges
- Supplied with CR2032 battery No. 548079 6032, adjustment key, over 25mm with setting gauge



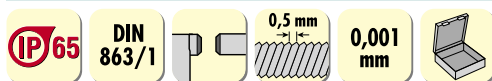
Measurement range mm	art.no.	€	DAkkS calibration	
			art.no.	€
0-25	<b>503490 0025</b>	<b>66,20</b>	070160 D001	<b>18,-</b>
25-50	503490 0050	<b>88,50</b>	073103 D047	<b>33,-</b>
50-75	503490 0075	<b>109,-</b>	073103 D052	<b>36,-</b>
75-100	503490 0100	<b>126,50</b>	073103 D052	<b>36,-</b>

5116

NEW

## SARA® Digital outside micrometer IP65

NEW



- robust with ratchet
- painted steel frame with hand guard
- spindle fixed by means of a locking lever
- spindle Ø 6.5mm
- calibration including setting gauges
- Supplied with CR2032 battery No. 548079 6032, adjustment key, over 25mm with setting gauge

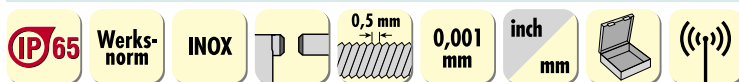
Measurement range mm	art.no.	€	DAkkS calibration art.no.	€
0-25	503491 0025	110,-	070160 D001	18,-
25-50	503491 0050	125,50	073103 D047	33,-
50-75	503491 0075	142,50	073103 D053	36,-
75-100	503491 0100	157,-	073103 D053	36,-

5116



## HELIOS · PREISSER Digital outside micrometer IP65 wireless

NEW



- robust frame, painted with thermal protection
- readings via 10mm-high digits
- compatible with **ATORN-Integrated-Wireless**
- advanced friction coupling
- spindle Ø 6.5mm
- **Function:** On/Off, mm/inch, ORIGIN (store starting value), Hold, TOL (tolerance input), key lock, integrated radio transmitter
- Supplied with CR2032 battery and setting gauge over 25mm measurement range

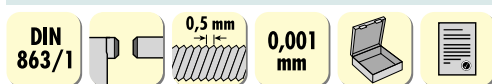
Measurement range mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
0-25	0.002	503380 0025	264,-	070160 D001	18,-
25-50	0.002	503380 0050	325,-	073103 D047	33,-
50-75	0.003	503380 0075	399,-	073103 D052	36,-
75-100	0.003	503380 0100	445,-	073103 D052	36,-

5186



integrated radio

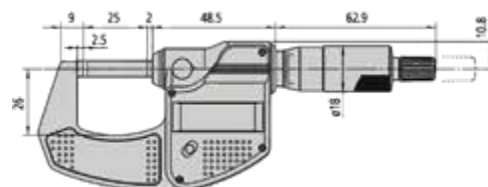
## Mitutoyo Digital outside micrometer



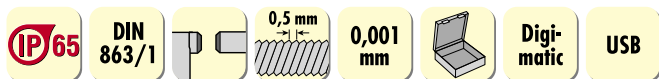
- Robust special cast iron frame, painted, with hand protection
- Scale barrel and scale sleeve matt chrome-plated
- Readings via large LCD display with 7.5 mm high digits
- Automatic switch-off after 20 minutes
- Front cover made from oil-resistant plastic
- Scale barrel Ø 18 mm
- Spindle Ø 6.35 mm
- **Functions:** Zero point at battery change (ORIGIN), battery check
- Supplied in a case with factory certificate, adjustment key and SR44 battery, no. 500534 0001

Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
0-25	3	503320 2025	159,-	070160 D001	18,-

5102



# Mitutoyo Digital outside micrometer IP65



- Precision design with ratchet
- Shock-proof design
- Robust frame made from special cast iron, painted, with hand protection
- Spindle fixed by means of a lever button
- Matt chrome-plated scale sleeve and scale barrel
- Readings via large LCD display with 7.5 mm high digits
- Automatic switch-off if left idle
- "Function Lock" for saving original values up to a measurement range of 100 mm
- Scale barrel Ø 18 mm
- Spindle Ø 6.35 mm
- Calibration includes setting gauge
- Accuracy exceeds DIN 863 requirements
- **Functions:** Initial value (ORIGIN), zeroing/absolute (ZERO/ABS), hold value (HOLD), automatic switch-off, battery check
- Supplied with adjustment key and SR44 battery, no. 500534 0001; versions with measurement ranges over 25 mm include setting gauge and versions up to 50 mm include factory certificate
- **Optional accessories:** Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m); USB cable type B-USB, no. 563110 0002

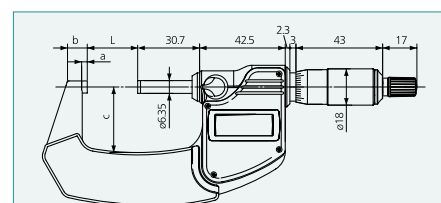
**With factory certificate for measurement ranges up to 50 mm!**



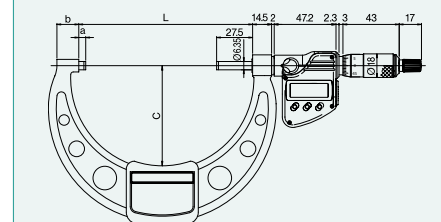
## Individual, without data output

Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
0-25	2	503316 0025	205,-	070160 D001	18,-
25-50	2	503316 0050	288,-	073103 D047	33,-
50-75	2	503316 0075	348,-	073103 D052	36,-
75-100	3	503316 0100	396,-	073103 D052	36,-

5102



Measurement range 0-100



Measurement range 100-300

## Individual, with data output

Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
0-25	2	503307 0025	265,-	070160 D001	18,-
25-50	2	503307 0050	313,-	073103 D047	33,-
50-75	2	503307 0075	412,-	073103 D052	36,-
75-100	3	503307 0100	456,-	073103 D052	36,-
100-125	3	503302 0125	606,-	073103 D048	45,-
125-150	3	503302 0150	624,-	073103 D049	50,-
150-175	4	503302 0175	641,-	073103 D049	50,-
175-200	4	503302 0200	654,-	073103 D049	50,-
200-225	4	503302 0225	665,-	073103 D050	58,-
225-250	5	503302 0250	676,-	073103 D050	58,-
250-275	5	503302 0275	688,-	073103 D050	58,-
275-300	5	503302 0300	732,-	073103 D050	58,-

5102

Measurement range	L	a	b	c
0-25	-	2,8	9,0	25,0
25-50	25,0	2,8	9,8	32,0
50-75	50,0	2,8	12,6	47,0
75-100	75,0	2,8	14,0	60,0
100-125	132,8	5,3	16,7	76,5
125-150	158,2	5,7	18,8	91,0
150-175	183,6	6,1	19,1	103,1
175-200	208,8	6,3	18,2	115,3
200-225	234,2	6,7	16,8	126,8
225-250	258,0	5,5	18,0	139,8
250-275	284,0	6,5	18,0	152,3
275-300	309,0	6,5	18,0	166,0

## Set

- **Digital outside micrometers with data output**
- Supplied in a case with adjustment key, battery and necessary setting gauges

Measurement range mm	Contents	art.no.	€	DAkkS calibration art.no.	€
0-75	3 outside micrometers, 2 setting gauges	503314 0075	1.080,-	073103 D034	84,-
0-100	4 outside micrometers, 3 setting gauges	503314 0100	1.528,-	073103 D041	120,-

5102



503314 0100

## Mitutoyo Digital outside micrometer QuantuMike



- The world's first outside micrometer with **2 mm spindle pitch**
- Particularly suitable for one-handed measurements and for use on a stand
- Barrel and quick adjustment with ratchet design
- LCD display with 7.5 mm high digits
- "Function Lock" for saving original values
- Switches off automatically after 20 minutes of inactivity
- Accuracy exceeds DIN 863 requirements
- Calibration includes setting gauge
- **Functions:** Initial value (ORIGIN), hold value and data transfer (HOLD/DATA), ON/OFF
- Supplied with SR44 battery (no. 500534 0001) and adjustment key; versions over 25 mm with setting gauge and factory certificate for measurement ranges up to 50 mm
- **Optional accessories:** Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m), USB cable type B-USB, no. 563110 0002

**With factory certificate for measurement ranges up to 50 mm!**



### Without data output

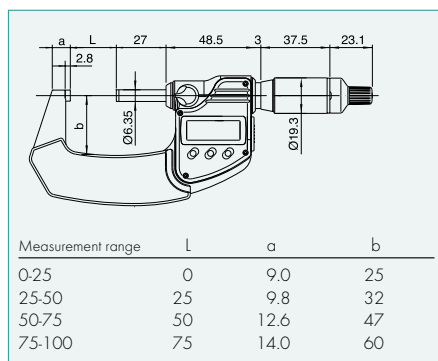
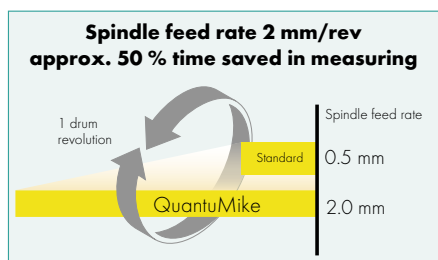
Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
0-25	2	503301 0025	226,-	070160 D001	18,-
25-50	2	503301 0050	312,-	073103 D047	33,-
50-75	2	503301 0075	373,-	073103 D052	36,-
75-100	3	503301 0100	424,-	073103 D052	36,-

5102

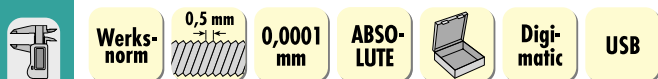
### With data output

Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
0-25	2	503301 1025	320,-	070160 D001	18,-
25-50	2	503301 1050	395,-	073103 D047	33,-
50-75	2	503301 1075	479,-	073103 D052	36,-
75-100	3	503301 1100	541,-	073103 D052	36,-

5102

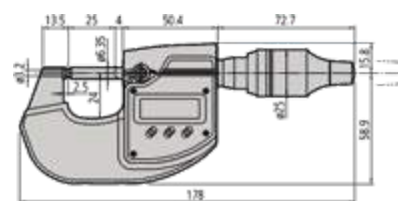


## Mitutoyo Digital high-precision outside micrometer



- High-precision outside micrometer for testing workpieces with particularly tight tolerances, e.g. ground parts
- Reinforced structure with particularly stable clamp
- Special heat-insulated recessed handles to prevent thermal expansion resulting from hand warmth
- Measuring barrel with ratchet design, measuring force 7-9 N
- **ABSOLUTE rotary encoder**
- Digimatic2 version
- Measuring areas Ø 3.2 mm
- Weight 400 g
- Supplied with additional heat-insulated recessed handle, screwdriver, adjustment key and battery CR2032 No. 548079 6032
- **Special accessories:** Digimatic cable Type B No. 563100 0011 (1 m), No. 563100 0012 (2 m), USB cable Type B-USB No. 563110 0002

ABSOLUTE®



Additional thermal protection for freehand measurements



Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
0-25	0.6	503317 2025	1.694,-	070160 D001	18,-

5102

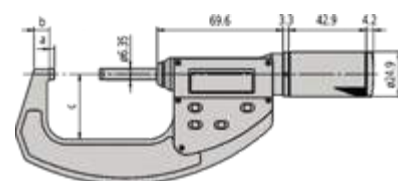
## Mitutoyo Digital outside micrometers QuickMike



ABSOLUTE®

- For rapid, highly accurate measurement of different diameters and precise measurements on sensitive surfaces
- Steel frame, with ratchet barrel
- Spindle feed 10 mm/rev, non-rotating spindle
- LCD display with 10 mm high digits
- Unrestricted traverse speed
- Battery life 5 years
- Scale barrel Ø: 25 mm, spindle Ø: 6.35 mm
- Calibration including setting gauge
- **Function:** Initial value (ORIGIN), ZERO/ABS, hold value (HOLD), ON/OFF, battery check
- Supplied with SR44 battery, No. 500534 0001; versions over 25 mm include setting gauge
- **Special accessories:** Digi-matic cable Type B No. 563100 0011 (1 m), No. 563100 0012 (2 m), USB cable Type B-USB No. 563110 0002

**30 mm measurement range with 3 rotations!**



### Standard version

Measurement range mm	a mm	b mm	c mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
0-30	2.0	7.0	25	2	503315 2030	495,-	070160 D002	20,-
25-55	2.8	8.5	36	3	503315 2055	582,-	073103 D047	33,-
50-80	2.8	10.3	47	3	503315 2080	624,-	073103 D052	36,-
75-105	2.8	10.7	60	3	503315 2105	647,-	073103 D049	50,-

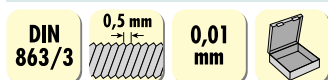
5102

### Blade-type measuring areas

Measurement range mm	Error limit µm	A mm	B mm	art.no.	€	DAkkS calibration art.no.	€
0-30	3	0.75	6.5	503617 2007	867,-	070160 D002	20,-

5102

## SARA® Special-purpose outside micrometers



- Precision design with ratchet
- Frame with hand protection
- Reading parts matt chrome-plated
- Scale barrel Ø: 17 mm
- Spindle Ø: 6.5 mm
- Calibration includes setting gauge
- Supplied with adjustment key, versions over 25 mm include setting gauge

### With Ø 20 mm disc measuring faces

- For tooth width measurement

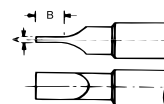
Measurement range mm	Plate measurement face Ø mm	art.no.	€	DAkkS calibration art.no.	€
0-25	20	503524 0025	180,-	070160 D001	18,-
25-50	20	503524 0050	207,-	073103 D047	33,-
50-75	20	503524 0075	234,-	073103 D052	36,-
75-100	20	503524 0100	275,-	073103 D052	36,-

5116



### With blade-type measuring faces

- For measuring narrow grooves and recesses
- Non-rotating spindle
- With friction ratchet



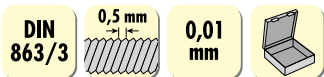
Measurement range mm	A mm	B mm	art.no.	€	DAkkS calibration art.no.	€
0-25	0.75	6.5	503525 0025	203,-	070160 D001	18,-
25-50	0.75	6.5	503525 0050	234,-	073103 D047	33,-

5116

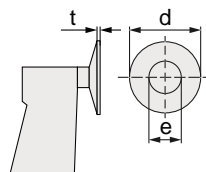




## Mitutoyo Special-purpose outside micrometers



- Sturdy, with ratchet
- Painted steel clamp
- Reading parts matt chrome-plated
- Scale barrel  $\varnothing$  18 mm, spindle  $\varnothing$  6.35 mm
- Supplied with a case, including adjustment key and setting gauge
- Calibration incl. setting gauge



### Type D7, with $\varnothing$ 20 x 0.7 mm disc measuring faces

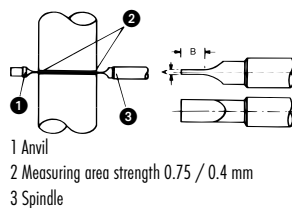
- For tooth width measurement, module 0.5 to 6

Measurement range mm	Parallelism $\mu$ m	Error limit $\mu$ m	d1 mm	e mm	t mm	art.no.	€	DAkkS calibration	
								art.no.	€
0-25	4	4	20	8	0.7	503511 0025	231,-	070160 D001	18,-
25-50	4	4	20	8	0.7	503511 0050	259,-	073103 D052	33,-
50-75	6	6	20	8	0.7	503511 0075	285,-	073103 D052	36,-
75-100	6	6	20	8	0.7	503511 0100	331,-	073103 D052	36,-
100-125	7	7	30	12	1.0	503511 0125	349,-	073103 D049	45,-
125-150	7	7	30	12	1.0	503511 0150	368,-	073103 D049	50,-
150-175	8	7	30	12	1.0	503511 0175	394,-	073103 D049	50,-
175-200	8	8	30	12	1.0	503511 0200	427,-	073103 D049	50,-

5102



503511 0025



### Form D4, with blade-type measuring areas

- For measuring narrow slots and recesses
- 503517 1101 and 503517 1102 carbide-tipped measuring areas

NEW

Measurement range mm	A mm	B mm	art.no.	€	DAkkS calibration	
					art.no.	€
0-25	0.75	6.5	503517 1001	261,-	070160 D001	18,-
25-50	0.75	6.5	503517 1002	315,-	073103 D047	33,-
50-75	0.75	6.5	503517 1003	337,-	073103 D052	36,-
75-100	0.75	6.5	503517 1004	366,-	073103 D052	36,-
100-125	0.75	6.5	503517 1005	389,-	073103 D048	45,-
125-150	0.75	6.5	503517 1006	410,-	073103 D049	50,-
150-175	0.75	6.5	503517 1009	445,-	073103 D049	50,-
175-200	0.75	6.5	503517 1008	487,-	073103 D049	50,-
0-25	0.4	4	503517 1111	282,-	070160 D001	18,-
25-50	0.4	4	503517 1112	301,-	073103 D047	33,-

5102

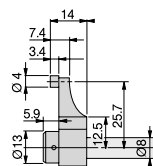


### With measuring jaws

- For measuring in areas that are difficult to access, such as flanges, recesses or bores

Measurement range mm	Error limit $\mu$ m	art.no.	€	DAkkS calibration	
				art.no.	€
0-25	5	503535 0025	335,-	070160 D001	18,-
25-50	6	503535 0050	355,-	073103 D047	33,-
50-75	7	503535 0075	423,-	073103 D052	36,-
75-100	8	503535 0100	445,-	073103 D052	36,-

5102





# Mitutoyo Special-purpose digital outside micrometers IP65

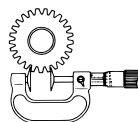
IP65
DIN 863/3
0,5 mm
0,001 mm
Digi-matic
USB



- Steel clamp, with ratchet and lock lever
- LCD display with 7.5 mm high digits
- Scale barrel Ø: 18 mm
- Spindle Ø: 6.35 mm
- **Functions:** Initial value (ORIGIN), zeroing/absolute (ZERO/ABS), hold value (HOLD)
- Supplied in a case with adjustment key and SR44 battery (no. 500534 0001); versions over 25 mm include setting gauge
- **Optional accessories:** Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m), USB cable type B-USB, no. 563110 0002

## Type D7

- For tooth width measurement, module 0.5 to 6
- Disc measuring faces Ø 20 x 0.7 mm
- Calibration includes setting gauge



Measurement range mm	Parallelism µm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
0-25	4	4	503611 0025	718,-	070160 D001	18,-
25-50	4	4	503611 1050	801,-	073103 D047	33,-
50-75	6	6	503611 1075	853,-	073103 D052	36,-
75-100	6	6	503611 1100	885,-	073103 D052	36,-

5102

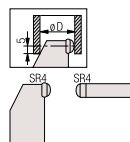


## Type D1, curved measuring faces, R4

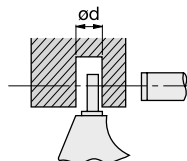
- e.g. for measuring wall thicknesses

Measurement range mm	Error limit µm	Measuring force N	D min. mm	art.no.	€	DAkkS calibration art.no.	€
0-25	2	5-10	15	503609 0005	574,-	070160 D001	18,-

5102



503609 0009



503609 0012

## Similar to type D12 with steel pin

- For measuring wall thickness

Measurement range mm	Error limit µm	Measuring force N	D min. mm	art.no.	€	DAkkS calibration art.no.	€
0-25	3	3-8	2	503609 0009	574,-	070160 D001	18,-
0-25	3	3-8	8.2	503609 0012	574,-	070160 D001	18,-

5102

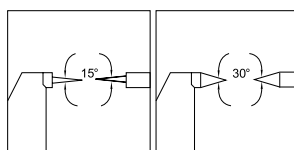


## Measuring faces as 15° or 30° tips

Measurement range mm	Error limit µm	15°		30°		DAkkS calibration	
		art.no.	€	art.no.	€	art.no.	€
0-25	2	503603 0025	648,-	503605 0025	648,-	071210 D001	28,-

5102

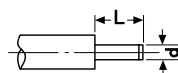
5102



Continued on next page >>>

**Type D3, offset measuring faces**

- For measuring grooves, spline shafts, recesses and fittings



Measurement range mm	L mm	d mm	art.no.	€	DAkkS calibration art.no.	€
0-25	5	2	503601 0005	685,-	070160 D001	18,-

5102



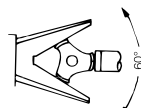
**Mitutoyo Special-purpose digital outside micrometers**

DIN 863/3
0,5 mm
0,001 mm
Digi-matic
USB

- Sturdy, with ratchet
- Painted steel frame with hand protection
- Spindle fixed by means of a lever button
- Readings via large LCD display with 7.5 mm high digits
- Scale barrel Ø: 18 mm
- Spindle Ø: 6.35 mm
- Calibration includes setting gauge
- **Functions:** Pre-set (PRESET), zeroing/absolute (ZERO/ABS), hold value (HOLD), automatic switch-off, battery check
- Supplied with adjustment key, SR44 battery (no. 500534 0001) and setting gauge
- **Optional accessories:** Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m); USB cable type B-USB, no. 563110 0002

**Type D10-3 for measuring three-fluted machining tools**

- Precision-lapped measuring face and V-block
- Spindle pitch 0.75 mm



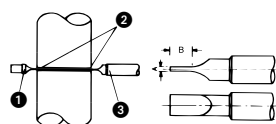
Measurement range mm	Prism angle	art.no.	€	DAkkS calibration art.no.	€
1-15	60°	503607 0011	870,-	070160 D200	114,-
10-25	60°	503607 0012	909,-	070160 D200	114,-
25-40	60°	503607 0013	932,-	070160 D201	134,-

5102



**Type D4 for measuring narrow grooves and recesses**

- Blade-type measuring faces, non-rotating spindle
- Spindle pitch 0.5 mm



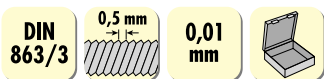
- 1 Anvil
- 2 Measuring area strength 0.75 / 0.4 mm
- 3 Spindle

Measurement range mm	A mm	B mm	Hardened measuring areas art.no.	€	DAkkS calibration art.no.	€
0-25	0.75	6.5	503617 0001	956,-	070160 D001	18,-
25-50	0.75	6.5	503617 0002	1.038,-	073103 D047	33,-
50-75	0.75	6.5	503617 0003	1.081,-	073103 D052	36,-
75-100	0.75	6.5	503617 1004	1.118,-	073103 D052	36,-
0-25	0.4	3.0	503617 0005	1.003,-	070160 D001	18,-
25-50	0.4	3.0	503617 1006	1.090,-	073103 D047	33,-

5102



## Mitutoyo Outside micrometer with replaceable anvil

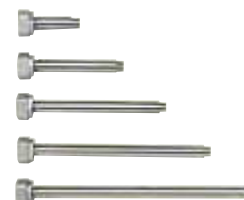


- **Form D16**
- The replaceable measuring anvils permit a variable measurement range. Adjustments are performed using the setting gauge provided.
- Painted steel frame with bores to reduce weight
- Spindle fixed by means of a locking lever
- Reading parts matt chrome-plated
- Scale barrel Ø: up to 300 mm = 18 mm, above 300 mm = 21 mm
- Spindle Ø up to 300 mm = 6.35 mm, above 300 mm = 8 mm
- Error margin: up to 500 mm = DIN, from 500 mm = ± (4 + L/75) µm
- Measuring faces: Carbide-tipped spindle
- Inserts: special steel, hardened
- Calibration including setting gauges
- Supplied with adjustment key, replaceable inserts and setting gauges

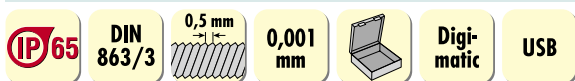


Measurement range mm	Inserts	Setting gauges	Factory calibration		DAkkS calibration	
			art.no.	€	art.no.	€
0-100	4	3	502931 0100	417,-	073103 D003	120,-
0-150	6	5	502931 0150	607,-	073103 D004	105,-
100-200	4	4	502931 0200	530,-	073103 D005	113,-
150-300	6	6	502931 0300	772,-	073103 D006	179,-
200-300	4	4	502931 0301	574,-	073103 D007	137,-
300-400	4	4	502931 0400	737,-	073103 D008	171,-
400-500	4	4	502931 0500	812,-	073103 D009	220,-
500-600	4	4	502931 0600	1.157,-	073103 W258	418,-
600-700	4	4	502931 0700	1.289,-	073103 W010	450,-
700-800	4	4	502931 0800	1.396,-	073103 W010	450,-
800-900	4	4	502931 0900	1.560,-	073103 W010	450,-
900-1000	4	4	502931 1000	1.679,-	073103 W010	450,-

5102



## Mitutoyo Digital outside micrometer with replaceable anvil



- **Type D16**
- Replaceable measuring anvils permit a variable measurement range. Adjustments are performed using the setting gauge provided.
- Painted steel frame with bores to reduce weight
- Spindle fixed by means of a lever button
- Readings via large LCD display with 7.5 mm high digits
- **With IP65 protection rating (size 0150 and 0300)**
- Scale barrel Ø: up to 300 mm = 18 mm, above 300 mm = 21 mm
- Spindle Ø up to 300 mm = 6.35 mm, above 300 mm = 8 mm
- Error margin: up to 500 mm = DIN
- Measuring faces: Carbide-tipped spindle, inserts made from hardened special steel
- **Functions:** Pre-set (PRESET), zeroing/absolute (ZERO/ABS), hold value (HOLD), automatic switch-off, battery check
- Calibration includes setting gauges
- Supplied with adjustment key, SR44 battery (no. 500534 0001), replaceable inserts and setting gauges
- **Optional accessories:**
  - for size 0150 and 0300: Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m), USB cable type B-USB, no. 563110 0002
  - for size 0401 and 0501: Digimatic cable type C, no. 563100 0021 (1 m), no. 563100 0022 (2 m), USB cable type C-USB, no. 563110 0003



Staub- und  
Wasserdicht  
IP65  
  
www.tuv.com  
ID 4011207400



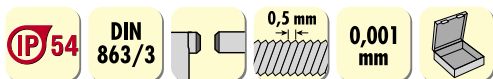
5033210401 and  
5033210501

Measurement range mm	Inserts	Setting gauges	Protection type	Factory calibration		DAkkS calibration	
				art.no.	€	art.no.	€
0-150	6	5	IP 65	503321 0150	920,-	073103 D004	105,-
150-300	6	6	IP 65	503321 0300	1.144,-	073103 D006	179,-
300-400	4	4	-	503321 0401	1.193,-	073103 D008	171,-
400-500	4	4	-	503321 0501	1.238,-	073103 D009	220,-

5102



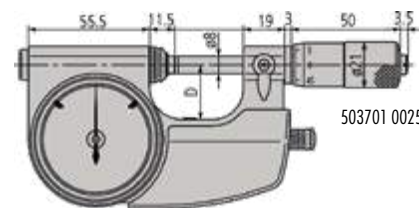
## Mitutoyo Indicating calliper micrometer



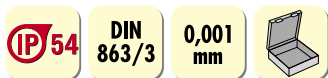
- **Type D13**
- For series testing
- Large easy-to-read scale
- Measuring faces carbide-tipped, ground and finely lapped
- Screw for carrying out zeroing adjustments
- Adjustable tolerance marks for go and no-go measurements
- Conveniently located return motion lever on the right or left side
- Matt chrome-plated scale barrel and scale sleeve, Ø 21 mm
- Measuring spindle Ø 8 mm
- Display range ± 0.06 mm
- Error margin for micrometer: 0.002 mm
- Error margin for display: 0.001 mm
- Planarity 0.3 µm
- Measuring force 5 - 10 N
- Calibration includes setting gauge
- Supplied with adjustment key, versions over 25 mm include setting gauge

Measurement range mm	Retraction lever	Parallelism µm	D mm	Weight kg	art.no.	€	DAkkS calibration	
							art.no.	€
0-25	Right-hand	0.6	25	0.520	503701 0025	725,-	070170 D001	32,-
0-25	Left-hand	0.6	25	0.520	503701 1025	727,-	070170 D001	32,-
25-50	Left-hand	0.6	38	0.670	503701 0050	818,-	073103 D012	56,-
50-75	Left-hand	1.0	50	0.820	503701 0075	993,-	073103 D012	56,-
75-100	Left-hand	1.0	63	0.970	503701 0100	1.056,-	073103 D012	56,-

5102



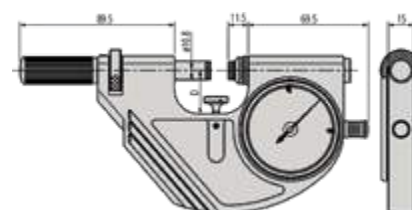
## Mitutoyo Passameter



- For series testing
- With built-in indicating calliper
- Conveniently located return motion lever
- Workpiece support
- Measuring faces Ø 10.8 mm
- Planarity 0.3 µm
- Measuring force 5 - 10 N
- Large easy-to-read scale
- Adjustable tolerance marks for go and no-go measurements
- Display range ± 0.06 mm
- Error margin for indicating calliper: 0.001 mm

Measurement range mm	Parallelism µm	D mm	L mm	Weight kg	art.no.	€	DAkkS calibration	
							art.no.	€
0-25	0.6	25	31	0.740	503705 0025	601,-	070170 D001	32,-
25-50	0.6	35	56	0.840	503705 0050	692,-	070170 D002	40,-
50-75	1.0	47.5	81	0.950	503705 0075	761,-	070170 D002	40,-
75-100	1.0	60	106	1.080	503705 0100	841,-	070170 D002	40,-

5102



THE **BENCHMARK**  
STANDARD

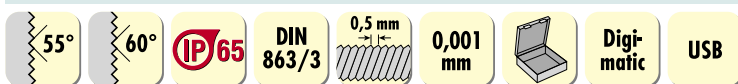
Mitutoyo



MITUTOYO  
Measuring equipment  
catalogue  
approx. 620 pages  
Art.no. 019900 0069

Overview of all free manufacturers' catalogues  
on page 16/17

## Mitutoyo Special-purpose outside micrometers for testing external threads



- **Type D18**, with locating bores for optional thread inserts
- For measuring pitch diameters on external threads
- Painted steel frame with hand protection, spindle fixed by means of a locking lever
- Scale barrel Ø: 18 mm
- Spindle Ø: 6.35 mm
- Calibration includes setting gauge
- Measuring inserts not included

### Analogue

- Reading parts matt chrome-plated
- 0.01 mm readings
- Supplied with adjustment key, versions over 25 mm include 60° setting gauge

Measurement range mm	a mm	art.no.	€	DAkkS calibration		Factory calibration	
				art.no.	€	art.no.	€
0-25	25	503515 0025	319,-	071260 D001	28,-		
25-50	32	503515 0050	382,-			073103 W057	62,-
50-75	45	503515 0075	425,-			073103 W057	62,-
75-100	65	503515 0100	450,-			073103 W057	62,-
100-125	79	503515 0125	466,-			073103 W056	96,-
125-150	93	503515 0150	563,-			073103 W056	96,-
150-175	105	503515 0175	618,-			073103 W056	96,-
175-200	120	503515 0200	661,-			073103 W056	96,-

5102

### Digital

- LCD display with 7.5 mm high digits
- 0.001 mm readings
- Automatic switch-off, battery check
- Supplied with SR44 battery (no. 500534 0001) and adjustment key, versions over 25 mm include 60° setting gauge
- **Optional accessories:** Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m); USB cable type B-USB, no. 563110 0002

Measurement range mm	a mm	art.no.	€	DAkkS calibration		Factory calibration	
				art.no.	€	art.no.	€
0-25	25	503615 1025	739,-	071260 D001	28,-		
25-50	32	503615 1050	925,-			073103 W057	62,-
50-75	45	503615 1075	949,-			073103 W057	62,-
75-100	65.5	503615 1100	999,-			073103 W057	62,-

5102

### Individual measuring inserts, 60°, for metric and UNF threads

- Hardened, with precision-finished V-block, taper and clamping shank

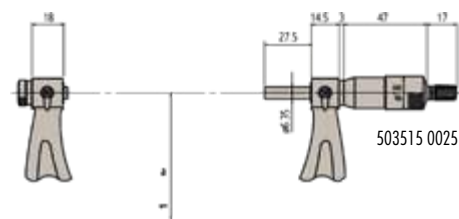
Pitch metr. mm	UNF TPI	art.no.	€	DAkkS calibration	
				art.no.	€
0.4 - 0.5	64 - 48	504009 0001	66,-	075662 D001	40,-
0.6 - 0.9	44 - 28	504009 0002	66,-	075662 D001	40,-
1.0 - 1.75	24 - 14	504009 0003	66,-	075662 D001	40,-
2.0 - 3.0	13 - 9	504009 0004	66,-	075662 D001	40,-
3.5 - 5.0	8 - 5	504009 0005	66,-	075662 D001	40,-
5.5 - 7.0	4.5 - 3.5	504009 0006	66,-	075662 D001	40,-

5102

### Individual measuring inserts, 55°, for Whitworth threads

Whitworth TPI	art.no.	€	DAkkS calibration	
			art.no.	€
60 - 48	504011 0001	66,-	075662 D001	40,-
48 - 40	504011 0002	66,-	075662 D001	40,-
40 - 32	504011 0003	66,-	075662 D001	40,-
32 - 24	504011 0004	66,-	075662 D001	40,-
24 - 18	504011 0005	66,-	075662 D001	40,-
18 - 14	504011 0006	66,-	075662 D001	40,-
14 - 10	504011 0007	66,-	075662 D001	40,-
10 - 7	504011 0008	66,-	075662 D001	40,-
7 - 4.5	504011 0009	66,-	075662 D001	40,-
4.5 - 3.5	504011 0010	66,-	075662 D001	40,-

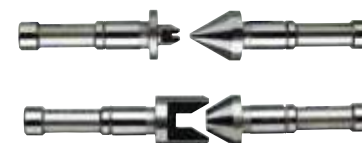
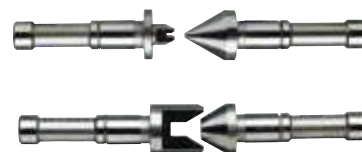
5102



503515 0025



503515 0025



Continued on next page >>>

**Measuring insert sets, 55° and 60°**

- 504009.... 60° thread angle
- 504011.... 55° thread angle

Contents	art.no.		€		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
5040090001 to 5040090006	<b>504009</b>	0020	<b>355,-</b>		075662 D006	<b>240,-</b>
5040110001 to 5040110010	504011	0011	<b>580,-</b>		075662 D007	<b>400,-</b>

5102

**Setting gauges, 55° and 60°**

- Hardened and precision-finished
- With hand protection
- 504005.... 55° thread angle
- 504007.... 60° thread angle

Nominal dimension mm	55°		60°		Factory calibration			
	art.no.	€	art.no.	€	art.no.	€		
25	<b>504005</b>	0025	<b>57,-</b>	<b>504007</b>	0025	<b>57,-</b>	073103 W126	<b>28,-</b>
50	504005	0050	<b>63,-</b>	504007	0050	<b>63,-</b>	073103 W126	<b>28,-</b>
75	504005	0075	<b>76,-</b>	504007	0075	<b>76,-</b>	073103 W126	<b>28,-</b>
100	504005	0100	<b>87,-</b>	504007	0100	<b>87,-</b>	073103 W126	<b>28,-</b>
125	504005	0125	<b>97,-</b>	504007	0125	<b>97,-</b>	073103 W127	<b>38,-</b>

5102

5102



504007 0050

**Mitutoyo Holder for outside micrometers**

- 5040010001: Cast iron design with large standing surface for holding outside micrometers with measurement ranges up to 100 mm; ideal reading position can be set by means of a swivel-mounted clamping jaw
- 5040010002: Cast-iron design especially for holding digital outside micrometers with measurement ranges up to 50 mm, clamping range 4 to 12 mm



504001 0001



504001 0002

Description	art.no.	€
For outside micrometers up to 100 mm	<b>504001</b>	0001 <b>59,-</b>
For digital outside micrometers up to 50 mm	504001	0002 <b>48,-</b>

5102

**SARA® Holder for outside micrometers**

- Cast iron design
- With a large standing surface for holding outside micrometers with measurement ranges up to 100 mm
- Ideal reading position can be adjusted by means of a swivel-mounted clamping jaw



Description	art.no.	€
For outside micrometers up to 300 mm	<b>504002</b>	0001 <b>35,50</b>

5116

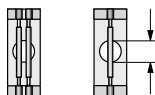


## Mitutoyo Thread measuring wires

- For mounting on micrometers
- For determining the pitch diameter of outside threads based on the three-wire method
- hardened, precision-lapped
- Error margin 0.001 mm
- with locating bore  $\varnothing$  6.35mm
- other versions available on request
- Free software for check gauge calculation is available on our homepage

### Check gauge M for metric thread DIN 13 Sheet 1

M3 = 3.113mm / M10 = 10.414mm / M22 = 23.163mm  
 M4 = 4.305mm / M12 = 12.650mm / M24 = 25.606mm  
 M5 = 5.153mm / M14 = 15.021mm / M27 = 28.605mm  
 M6 = 6.346mm / M16 = 17.021mm / M30 = 30.848mm  
 M8 = 8.282mm / M20 = 21.163mm / M33 = 33.848mm

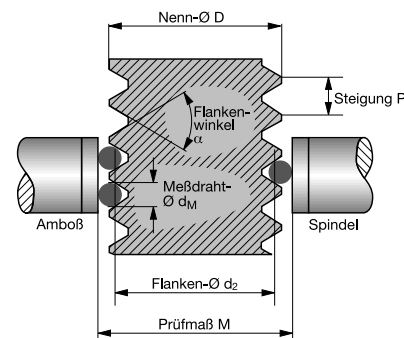


Locating bore



Thread	Pitch metr. mm	Whitworth TPI	UNC, UNF TPI	Pilot wire $\varnothing$ mm	Holder $\varnothing$ 6.35 mm art.no.	€	DAkkS calibration art.no.	€
M3	0.50	-	56	0.290	504019 0290	118,-	075032 D009	50,-
M4-M5	0.70-0.80	-	32	0.455	504019 0455	118,-	075032 D009	50,-
M6-M7	1.00	26.24	24	0.620	504019 0620	118,-	075032 D009	50,-
M8-M9	1.25	22.20.19	20	0.725	504019 0725	118,-	075032 D009	50,-
M10-M11	1.50	18.16	18, 16	0.895	504019 0895	118,-	075032 D009	50,-
M12	1.75	14	14, 13	1.100	504019 1100	118,-	075032 D009	50,-
M14-M16	2.00	12.11	12, 11	1.350	504019 1350	118,-	075032 D009	50,-
M20-M22	2.50	10.9	10, 9	1.650	504019 1650	118,-	075032 D009	50,-
M24-M33	3.00-3.50	8.7	8, 7	2.050	504019 2050	118,-	075032 D009	50,-

5103



## Mitutoyo Setting gauges for outside micrometers

- For testing and adjusting outside micrometers
- Hardened
- With hand protection
- Finely lapped measuring faces
- With actual dimension details
- Error margin:  $\pm (1 + L/50) \mu\text{m}$
- Planarity: 0.3  $\mu\text{m}$
- Setting gauges up to 2,000 mm available on request

Nominal dimension mm	art.no.	€	DAkkS calibration art.no.	€
25	504003 0025	27,-	075033 D001	13,-
50	504003 0050	30,-	075033 D001	13,-
75	504003 0075	31,-	075033 D002	16,-
100	504003 0100	32,-	075033 D002	16,-
125	504003 0125	34,-	075033 D003	21,-
150	504003 0150	36,-	075033 D003	21,-
175	504003 0175	38,-	075033 D003	21,-
200	504003 0200	43,-	075033 D003	21,-
225	504003 0225	48,-	075033 D004	29,-
250	504003 0250	52,-	075033 D004	29,-
275	504003 0275	58,-	075033 D004	29,-
300	504003 0300	63,-	075033 D004	29,-
325	504003 0325	68,-	075033 D005	36,-
350	504003 0350	79,-	075033 D005	36,-
375	504003 0375	87,-	075033 D005	36,-
400	504003 0400	97,-	075033 D005	36,-
425	504003 0425	102,-	075033 D006	50,-
450	504003 0450	112,-	075033 D006	50,-
475	504003 0475	128,-	075033 D006	50,-
500	504003 0500	135,-	075033 D006	50,-

5102





## Mitutoyo Adjustable gap gauge

- Quick and reliable measurement of outside diameters up to 300 mm
- Check gauge adjusted with the aid of a corresponding gauge block
- Sturdy cast iron frame with Ø 8 mm collet for attaching a dial indicator
- Finely lapped carbide measuring faces
- Frame with insulation protection
- Lower measuring surface can be adjusted by 25 mm and is fixed by a locking ring
- Adjustable depth stop
- Measuring force  $15 \pm 3$  N
- Measuring face parallelism: 0.005 mm
- Calibration plus testing costs for the indicating measuring instrument
- Supplied without dial indicator in moulded packaging



Application example with digital dial indicator and holder

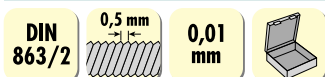


529001 0025

Measurement range mm	Total length mm	art.no.	€	Factory calibration		DAkkS calibration	
				art.no.	€	art.no.	€
0-25	277	<b>529001 0025</b>	<b>437,-</b>			074008 D001	<b>62,-</b>
25-50	302	529001 0050	<b>453,-</b>			074008 D001	<b>62,-</b>
50-75	328	529001 0075	<b>469,-</b>			074008 D001	<b>62,-</b>
75-100	353	529001 0100	<b>479,-</b>			074008 D001	<b>62,-</b>
100-125	379	529001 0125	<b>502,-</b>			074008 D002	<b>79,-</b>
125-150	404	529001 0150	<b>530,-</b>			074008 D002	<b>79,-</b>
150-175	429	529001 0175	<b>555,-</b>			074008 D002	<b>79,-</b>
175-200	455	529001 0200	<b>580,-</b>			074008 D002	<b>79,-</b>
200-225	480	529001 0225	<b>605,-</b>	074008 W901	<b>96,-</b>		
225-250	506	529001 0250	<b>631,-</b>	074008 W901	<b>96,-</b>		
250-275	531	529001 0275	<b>656,-</b>	074008 W901	<b>96,-</b>		
275-300	556	529001 0300	<b>681,-</b>	074008 W901	<b>96,-</b>		

5102

## Mitutoyo Depth micrometer



- With ratchet
- Bridge made from hardened and lapped tool steel
- Reading parts matt chrome-plated
- Spindle travel 25 mm, spindle Ø 4 mm
- Scale barrel Ø 18 mm
- Hardened and precision-machined inserts
- 504503 / 504505... with replaceable measuring inserts
- Calibration includes inserts
- Supplied with adjustment key

### Measuring bridge 63.5 x 16 mm

Measurement range mm	Base size mm	Inserts	art.no.	€	Factory calibration		DAkkS calibration	
					art.no.	€	art.no.	€
0-25	63.5x16	-	<b>504501 0025</b>	<b>149,-</b>			074009 D001	<b>24,-</b>
0-50	63.5x16	2	504503 0050	<b>174,-</b>	073103 W107	<b>35,-</b>		
0-75	63.5x16	3	504503 0075	<b>184,-</b>	073103 W108	<b>50,-</b>		
0-100	63.5x16	4	504503 0100	<b>229,-</b>	073103 W104	<b>65,-</b>		
0-150	63.5x16	6	504503 0150	<b>317,-</b>	073103 W105	<b>115,-</b>		
0-300	63.5x16	12	504503 0300	<b>480,-</b>	073103 W106	<b>265,-</b>		

5102

### Measuring bridge 101.6 x 16 mm

Measurement range mm	Base size mm	Inserts	art.no.	€	Factory calibration		DAkkS calibration	
					art.no.	€	art.no.	€
0-25	101.6x16	-	<b>504501 1025</b>	<b>185,-</b>			074009 D001	<b>24,-</b>
0-50	101.6x16	2	504505 0050	<b>203,-</b>	073103 W107	<b>35,-</b>		
0-75	101.6x16	3	504505 0075	<b>217,-</b>	073103 W108	<b>50,-</b>		
0-100	101.6x16	4	504505 0100	<b>252,-</b>	073103 W104	<b>65,-</b>		
0-150	101.6x16	6	504505 0150	<b>329,-</b>	073103 W105	<b>115,-</b>		
0-300	101.6x16	12	504505 0300	<b>503,-</b>	073103 W106	<b>265,-</b>		

5102



504501 0025

## Mitutoyo Digital depth micrometer



- With ratchet
- Bridge made of tool steel, hardened and lapped
- Extremely easy to read thanks to 6.6 mm high LCD digits
- **With replaceable measuring inserts**
- Spindle travel 25 mm, spindle Ø 4 mm
- Scale barrel Ø 18 mm
- **Functions:** Pre-set (PRESET), zeroing/absolute (ZERO/ABS), hold value (HOLD), automatic switch-off and battery check
- Dimension A = measurement range
- Calibration includes inserts
- Supplied with adjustment key, battery SR 44 No. 500534 0001 and replaceable measuring inserts
- **Special accessories:** Digimatic cable Type B No. 563100 0011 (1 m), No. 563100 0012 (2 m), USB cable Type B-USB No. 563110 0002



Measurement range mm	Base size mm	Inserts			Factory calibration	
			art.no.	€	art.no.	€
0-150	101.6x16	6	504601 1150	793,-	073103 W105	115,-
0-300	101.6x16	12	504601 1300	1.034,-	073103 W106	265,-

5102

## Mitutoyo Depth gauge with dial indicator readings



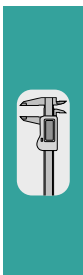
- **With replaceable extensions**
- Bridge made from hardened and lapped tool steel
- Anticlockwise dial indicator
- Measurement depth adjusted by changing the dial indicator extensions
- Diameter of extension: 5 mm
- Dial indicator accuracy: fe = 12 µm
- Calibration includes measuring bridge
- Supplied with extensions

Measurement range mm	Display area mm	Base size mm	Extensions mm			Factory calibration	
				art.no.	€	art.no.	€
0-200	10	63.5x16	10, 20, 30, 30, 100	504801 0200	210,-	073103 W024	29,-
0-200	10	101.6x16	10, 20, 30, 30, 100	504801 1200	226,-	073103 W024	29,-

5102



504801 0200



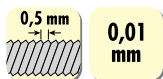
**THE BENCHMARK STANDARD**



**MITUTOYO**  
Measuring equipment  
catalogue  
approx. 620 pages  
Art.no. 019900 0069

Overview of all free manufacturers' catalogues  
on page 16/17

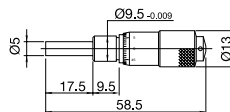
## Mitutoyo Built-in micrometers



- For integration into fixtures and machinery, allowing moving parts to be precisely positioned
- Spindle fully hardened and ground
- Reading parts matt chrome-plated
- Straight clamping shank

### Small version

- Measuring areas, hardened (> 60 HRC)



Measurement range mm	Error limit $\mu\text{m}$	Clamping $\varnothing$ mm	art.no.	€	DAkkS calibration art.no.	€
0-13	2	9.5	505111 0002	60,-	071230 D001	48,-

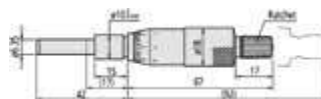
5102



505111 0002

### Standard version

- With rotating spindle
- Carbide-tipped measuring areas



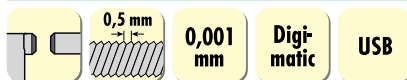
Measurement range mm	Error limit $\mu\text{m}$	Clamping shank $\varnothing$ mm	Reading mm	art.no.	€	DAkkS calibration art.no.	€
0-25	2	10	0.01	505120 0004	61,-	071230 D001	48,-

5102



505120 0004

## Mitutoyo Digital built-in micrometer



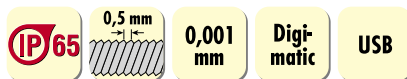
- Specially for use with coordinate measuring tables on measuring microscopes and measuring projectors
- Display component can be rotated through 330°
- Extremely easy to read with 7.5 mm high digits
- Automatic switch-off after 20 minutes
- Display and control buttons made from oil-resistant materials
- Straight clamping shank,  $\varnothing$  18 mm
- $\varnothing$  49 mm adjustment barrel with crank for quick adjustment
- Spindle hardened and ground
- **Functions:** ON/ZERO/ABS, reverse counting direction, PRESET
- Supplied in moulded packaging with two SR44 batteries, no. 500534 0001
- **Optional accessories:** Digimatic cable type C, no. 563100 0021 (1 m), no. 563100 0022 (2 m), USB cable type C-USB, no. 563110 0003



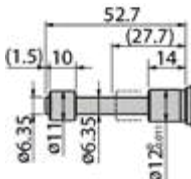
Measurement range mm	Error limit $\mu\text{m}$	art.no.	€	DAkkS calibration art.no.	€
0-50	3	505404 0001	816,-	071230 D002	56,-

5102

## Mitutoyo Digital built-in micrometer IP65



- Base body made from special cast iron, painted
- Spindle fixed by means of a clamping screw
- Extremely easy to read with 6.6 mm high digits
- Activates automatically when spindle moves
- Straight clamping shank,  $\varnothing$  12 mm
- Spindle  $\varnothing$  6.35 mm
- **Functions:** Pre-set (PRESET), zeroing/absolute (ZERO/ABS), hold value (HOLD) automatic switch-off, battery check
- Supplied in moulded packaging with adjustment key and SR44 battery, no. 500534 0001
- **Optional accessories:** Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m), USB cable type B-USB, no. 563110 0002



Measurement range mm	Error limit $\mu\text{m}$	Line bore end	art.no.	€	DAkkS calibration art.no.	€
0-25	2	Non-rotating measuring face	505402 0005	479,-	071230 D001	48,-
0-25	2	Carbide-tipped	505402 0006	444,-	071230 D001	48,-

5102



505402 0005



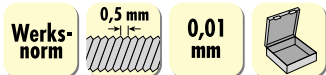
505402 0006



Staub- und Wasserdicht IP65

www.tuv.com ID 4011207400

## Inside micrometer with measuring jaws



- Workshop version with matt chrome-plating
- With ratchet
- Carbide-tipped measuring faces, precision machined
- Spindle fixed via a clamping screw
- Reading parts matt chrome-plated
- Scale barrel Ø: 17 mm
- Calibration includes ring gauges, reduced testing
- Supplied with adjustment key and ring gauge for measurement ranges 5 - 30 and 25 - 50 mm

### Individual

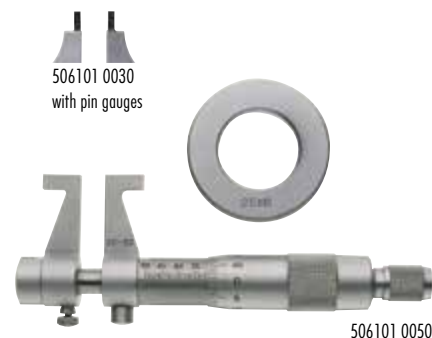
Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
5-30	10	506101 0030	177,50	073103 D078	98,-
25-50	12	506101 0050	193,-	073103 D019	98,-
50-75	14	506101 0075	223,-	072004 D001	62,-
75-100	16	506101 0100	262,-	072004 D001	62,-

5116

### Set

Measurement range mm	Contents	art.no.	€	DAkkS calibration art.no.	€
5-75	3x inside micrometers, 2x ring gauges: 5 and 25 mm	506103 0075	529,-	073103 D002	186,-

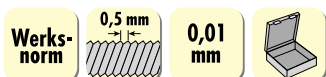
5116



506101 0050



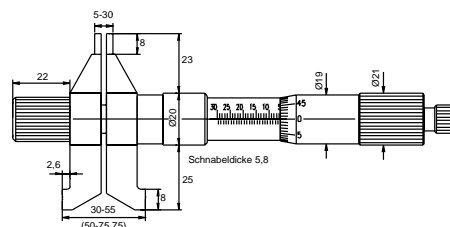
## ATORN® Inside micrometer with double jaws



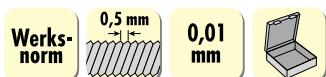
- Hardened and ground measuring spindle with ball bearing
- With robust, cylindrical **carbide measuring jaws**
- Two separate, individually adjustable inner scale sleeves for easy, direct readings and adjustment
- Measuring barrel Ø 21 mm
- Precision: 2 µm
- Constant measuring pressure due to advanced friction coupling

Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
5-55	2.5	506101 0555	899,-	073103 D079	98,-

5181



## Mitutoyo Inside micrometer with measuring jaws



- Precision design, matt chrome-plated
- With ratchet
- Carbide-tipped measuring faces, precision machined
- Reading parts matt chrome-plated
- Scale barrel Ø: 17 mm
- Supplied with adjustment key

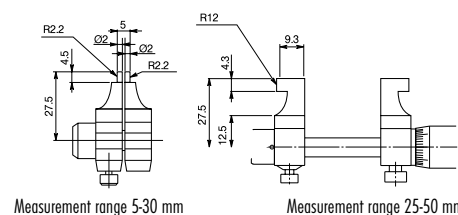
From 506301 0050  
with pin gauges



506301 0030

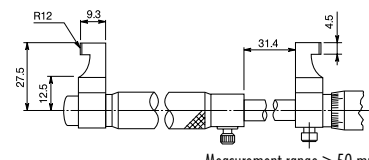
Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
5-30	5	506301 0030	251,-	072004 D001	62,-
25-50	6	506301 0050	291,-	072004 D001	62,-
50-75	7	506301 0075	303,-	072004 D001	62,-
75-100	8	506301 0100	347,-	072004 D001	62,-
100-125	9	506301 0125	467,-	072004 D002	82,-
125-150	9	506301 0150	527,-	072004 D002	82,-

5102



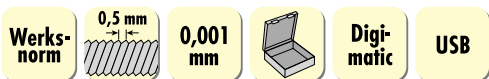
Measurement range 5-30 mm

Measurement range 25-50 mm

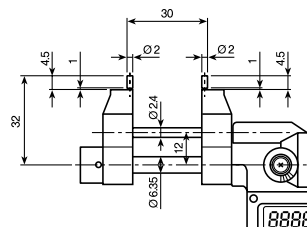


Measurement range > 50 mm

## Mitutoyo Digital inside micrometer with jaws



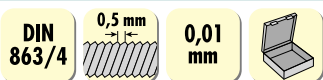
- Precision design with ratchet
- Spindle fixed via a clamping screw
- Carbide-tipped measuring faces, precision machined
- Extremely easy to read via LCD display with 6.6 mm high digits
- Activates automatically when spindle moves
- Scale barrel Ø: 18 mm
- **Functions:** Pre-set (PRESET), zeroing/absolute (ZERO/ABS), hold value (HOLD)  
Automatic switch-off, battery check
- Supplied with adjustment key and SR44 battery, no. 500534 0001
- **Optional accessories:** Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m); USB cable type B-USB, no. 563110 0002



Measurement range mm	Error limit µm	art.no.	€	DAkkS calibration art.no.	€
5-30	5	506402 0030	789,-	072004 D001	34,-

5102

## Mitutoyo Inside micrometer, fixed version



- Lightweight design featuring tubular construction
- Reading parts matt chrome-plated
- Rounded measuring faces carbide-tipped and lapped
- For measurement ranges from 75 mm, spindle is fixed by means of a clamping screw
- Measurement ranges above 100 mm include hand protection
- Scale barrel Ø: up to 100 mm = 15 mm, above 100 mm = 18 mm
- Supplied with adjustment key



### Single units

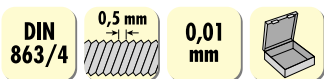
Measurement range mm	L mm	A mm	B mm	art.no.	€	DAkkS calibration art.no.	€
50-75	50	3.5	3	506501 0075	134,-	072003 D001	34,-
75-100	75	3.5	3	506501 0100	141,-	072003 D001	34,-
100-125	100	5.0	3	506501 0125	147,-	072003 D001	34,-
125-150	125	5.0	3	506501 0150	151,-	072003 D001	34,-
150-175	150	18.0	15	506501 0175	155,-	072003 D001	34,-
175-200	175	18.0	15	506501 0200	167,-	072003 D001	34,-
200-225	200	18.0	15	506501 0225	176,-	072003 D002	62,-
225-250	225	18.0	15	506501 0250	181,-	072003 D002	62,-
250-275	250	18.0	15	506501 0275	189,-	072003 D002	62,-
275-300	275	18.0	15	506501 0300	204,-	072003 D002	62,-

5102



Size 0100

## Mitutoyo Inside micrometer set



- Modular design
- Screwing on the graduated extensions makes it possible to measure all dimensions within the specified ranges
- Calibration includes extensions
- Supplied with adjustment key

### Hardened measuring faces

- Extensions with ground internal rod serving as the material measure
- Micrometer measurement range 13 mm
- Micrometer fixed by means of clamping screws
- Reading parts chrome-plated
- Scale barrel Ø: 15 mm
- Tubular Ø of extensions: 12.5 mm
- Error margin:  $(3+V+L/50) \mu\text{m}$ , L in mm, V = number of extensions

Measurement range mm	Extensions mm	art.no.	€	Factory calibration		DAkkS calibration	
				art.no.	€	art.no.	€
50-150	13, 25, 50	<b>506701</b> 0150	<b>235,-</b>			073103 D016	<b>248,-</b>
50-300	13, 25, 50, 50.100	506701 0300	<b>335,-</b>			073103 D017	<b>372,-</b>
50-500	13, 25, 50, 50, 100, 200	506701 0500	<b>459,-</b>			073103 D018	<b>434,-</b>
50-1000	13, 25, 50, 50, 100, 200, 200, 300	506701 1000	<b>607,-</b>	073103 W117	<b>180,-</b>		
50-1500	13, 25, 50, 50, 100, 200, 200, 200, 300, 300	506701 1500	<b>797,-</b>	073103 W118	<b>255,-</b>		

5102



506701 0300

### Carbide-tipped measuring faces

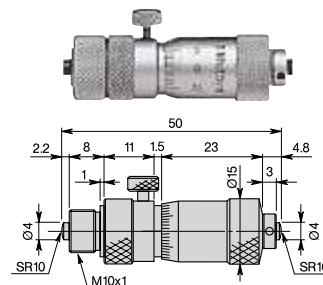
Measurement range mm	Extensions mm	art.no.	€	Factory calibration		DAkkS calibration	
				art.no.	€	art.no.	€
50-150	13, 25, 50	<b>506701</b> 0151	<b>303,-</b>			073103 D016	<b>248,-</b>
50-300	13, 25, 50, 50, 100	506701 0301	<b>429,-</b>			073103 D017	<b>372,-</b>
50-500	13, 25, 50, 50, 100, 200	506701 0501	<b>589,-</b>			073103 D018	<b>434,-</b>
50-1000	13, 25, 50, 50, 100, 200, 200, 300	506701 1001	<b>737,-</b>	073103 W117	<b>180,-</b>		
50-1500	13, 25, 50, 50, 100, 200, 200, 200, 300, 300	506701 1501	<b>936,-</b>	073103 W118	<b>255,-</b>		

5102

### Spare micrometer heads for micrometer sets, 506701....

Measurement range mm	Measuring area	art.no.	€	DAkkS calibration	
				art.no.	€
0-13	Hardened	<b>506701</b> 0001	<b>152,-</b>	072003 D001	<b>34,-</b>
0-13	Carbide-tipped	506701 0002	<b>191,-</b>	072003 D001	<b>34,-</b>

5102



### Carbide-tipped measuring faces

- Tubular extensions can be used individually as material measures
- Micrometer measurement range 25 mm
- Micrometer fixed by means of clamping screws
- Reading parts chrome-plated
- Scale barrel Ø: 18 mm
- Tubular Ø of extensions: 17 mm
- Error margin:  $(3+V+L/50) \mu\text{m}$ , L in mm, V = number of extensions

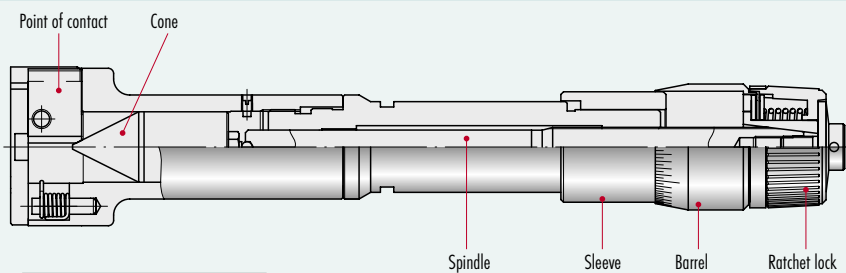
Measurement range mm	Extensions mm	art.no.	€	Factory calibration		DAkkS calibration	
				art.no.	€	art.no.	€
100-500	25, 50, 100, 200	<b>506703</b> 0500	<b>655,-</b>			073103 D015	<b>310,-</b>
100-900	25, 50, 100, 200, 400	506703 0900	<b>784,-</b>	073103 W116	<b>125,-</b>		
100-1300	25, 50, 100, 200, 400, 400	506703 1300	<b>940,-</b>	073103 W113	<b>150,-</b>		
100-1700	25, 50, 100, 200, 400, 400, 400	506703 1700	<b>1.102,-</b>	073103 W114	<b>175,-</b>		
100-2100	25, 50, 100, 200, 400, 400, 400, 400	506703 2100	<b>1.225,-</b>	073103 W115	<b>180,-</b>		

5102





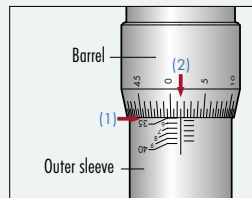
## Inside micrometers



### Reading off the scale

Scale division 0.005 mm

(1) external sleeve	35.000 mm
(2) barrel	0.015 mm
Reading	35.015 mm



### Alignment error

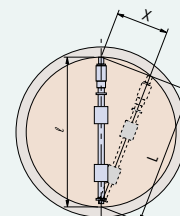
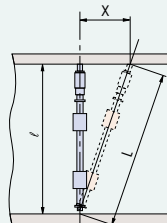


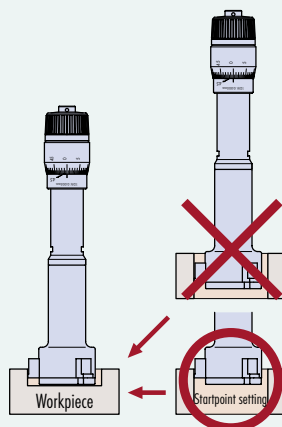
Fig. 1  
 $\ell$ : The inner diameter to be measured  
 $L$ : Length measured with axial offset X  
 $X$ : Offset in axial direction  
 $\Delta \ell$ : Error in measurement  
 $\Delta \ell: L \cdot e = \sqrt{L^2 + X^2} - L$

Fig. 2  
 $\ell$ : The inner diameter to be measured  
 $L$ : Length measured with radial offset X  
 $X$ : Offset in radial direction  
 $\Delta \ell$ : Error in measurement  
 $\Delta \ell: L \cdot e = \sqrt{L^2 + X^2} - L$

### Changing the measured values through a different measuring position

When using the Holtest Series, the measurement values when measuring with fully adjacent measuring faces and when measuring just with the points of the measuring face vary, due to the mechanical properties of the micrometer. Before measuring, set the reference value under the same conditions.

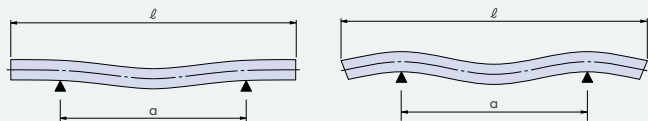
If only the points of the measuring faces are used for the measurement, then adjust the reference value correspondingly. The set-up must be as careful as the measurement!



When carrying out a measurement with the inside micrometer in an axial or radial direction, attention must be paid to the correct orientation of the inside micrometer. Misalignment during the measurement leads to the offset X (Figure 1 and Figure 2), and thus to an incorrect measurement. An axial offset X suggests a larger and a radial offset X a smaller than expected measurement.

### Airy points and Bessel points

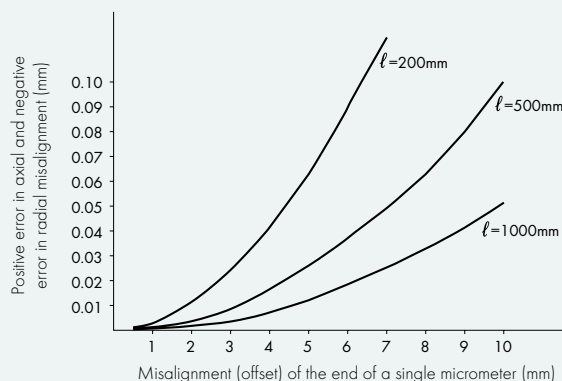
When a normal or an inside micrometer is positioned horizontally, supported at two points, it undergoes some bowing under load due to its own weight; the shape of this deformation depends on the distance between the support points. As the following figure shows, there are two distances between the supporting positions, which control this deformation in useful ways.



The ends of a standard (or inside) micrometer can be positioned precisely horizontally by spacing the two support positions symmetrically (see above figure). These points are referred to as 'Airy points' and are often used to ensure that the ends of a length-measuring instrument are parallel to each other, allowing the length to be determined accurately. The change in length of a standard (or inside) micrometer due to bowing under load can be reduced to a minimum by spacing the two positions of the supports symmetrically (see above figure). These points are called Bessel points and may be useful when using long inside micrometers.

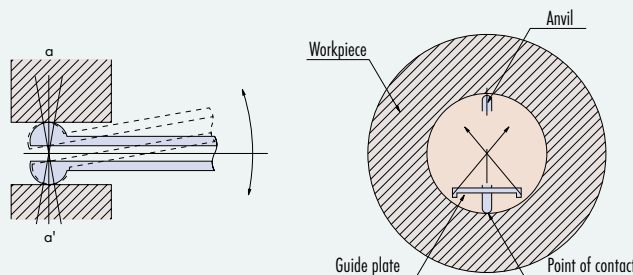
### Measurement errors due to temperature fluctuations of the inside micrometer

The heat transfer from the operator to the inside micrometer should be minimised to avoid significant measurement errors due to the temperature difference between the workpiece and the bore gauge. If the bore gauge is held directly in the hand, gloves should be worn or it should be gripped via a heat insulator (if available).



### Inside measuring instruments

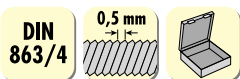
Mitutoyo internal measuring instruments for small holes have contact elements with a large curvature, allowing these to be easily positioned when measuring the diameter of the actual hole (in the direction a-a). The true diameter is the minimum value displayed on the dial indicator, while the internal measuring instrument is moved back and forth as shown by the arrow.



The spring-loaded centring bridge on a Mitutoyo two-point inside measuring device allows an automatic radial alignment, thus requiring only an axial rocking movement to find the minimum reading (true diameter).



## SARA® Inside micrometers with three-point contacts



- For measuring through-holes and blind holes
- Large measurement depths due to extension
- Reading and operating parts matt chrome-plated
- Measuring spindle fully hardened and ground
- Ratchet coupling for repeatable measuring force
- Self-centring measuring head with three laterally extending measuring probes
- Carbide-tipped from a measurement range of 12 mm
- Clearance a for 6 - 12 mm = 1.4 mm, 12 - 100 mm = 0.5 mm
- Scale division up to size 0012 = 0.001 mm, from size 0016 = 0.005 mm
- Calibration including ring gauges, reduced testing
- Supplied in a sturdy transport case including ring gauge and extension



Ring gauge standard accessories



507703 0040

507703 0088

### Individual

Measurement range mm	Error limit µm	Ring gauges mm	Measurement depth without extension mm	Measurement depth with extension mm	art.no.	€	DAkkS calibration art.no.	€
6-8	4	6	55	155	507703 0008	279,-	073103 D062	58,-
8-10	4	8	55	155	507703 0010	279,-	073103 D062	58,-
10-12	4	10	55	155	507703 0012	279,-	073103 D062	58,-
12-16	4	16	81	231	507703 0016	256,-	073103 D062	58,-
16-20	4	16	81	231	507703 0020	256,-	073103 D062	58,-
20-25	4	25	91	241	507703 0025	283,-	073103 D062	58,-
25-30	4	25	91	241	507703 0030	283,-	073103 D062	58,-
30-40	4	40	101	251	507703 0040	314,-	073103 D062	58,-
40-50	5	40	101	251	507703 0050	342,-	073103 D062	58,-
50-63	5	62	101	251	507703 0063	380,-	073103 D061	65,-
62-75	5	62	115	265	507703 0075	390,-	073103 D061	65,-
75-88	5	87	115	265	507703 0088	405,-	073103 D061	65,-
87-100	5	87	115	265	507703 0100	440,-	073103 D061	65,-

5120

### Sets

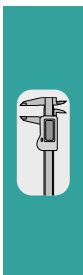
- Scale division for size 0012 = 0.001 mm, from size 0020 = 0.005 mm

Measurement range mm	Single units mm	Ring gauges mm	Extensions mm	art.no.	€	DAkkS calibration art.no.	€
6-12	6-8, 8-10, 10-12	6, 8, 10	100	507704 0012	739,-	073103 D036	174,-
12-20	12-16, 16-20	16	150	507704 0020	460,-	073103 D031	80,-
20-50	20-25, 25-30, 30-40, 40-50	25, 40	2 x 150	507704 0050	1.059,-	073103 D043	181,-
50-100	50-63, 62-75, 75-88, 87-100	62, 87	150	507704 0100	1.539,-	073103 D044	204,-

5120



507704 0050



## Mitutoyo Internal precision instruments MINI-HOLTEST



- For fast, direct bore measurements from Ø 2 mm
- Scale barrel and scale sleeve matt chrome-plated
- Carbide-tipped measuring faces
- Measuring force 5 - 10 N
- Error margin 2 µm

Measurement range mm	Single units mm	Ring gauges mm	art.no.	€	Factory calibration art.no.	€
2-3	2-2.5 / 2.5-3	2.5	507505 0003	1.933,-	072003 W020	55,-
3-6	3-4 / 4.5 / 5-6	4 / 5	507505 0006	2.091,-	072003 W021	92,-

5102

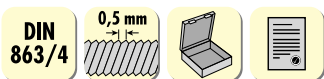


Measurement range 2-2.5 mm



507505 0003

## Mitutoyo HOLTEST inside micrometer with three-point contact



- With ratchet
- Reading parts matt chrome-plated
- Measuring faces offset 120°
- **Type A** 508102/508106: Measuring faces and taper made from hardened steel, contact point: Carbide
- **Type B** 508104/508108: Measuring faces: up to size 0012, titanium-coated carbide; from size 0016, titanium-coated measuring pins made from hardened steel. Contact point and taper: Carbide
- Scale barrel Ø: up to 12 mm measurement range = 17 mm, above 12 mm measurement range = 23 mm
- Readings: up to 12 mm measurement range = 0.001 mm, above 12 mm measuring range = 0.005 mm
- Supplied in a case with screwdriver and key for extension assembly
- **Accessories:** Ring gauges no. 540135..., extensions no. 508701....

### Individual

Measurement range mm	Error limit µm	Measurement depth without extension mm	Type A art.no.	€	Type B art.no.	€	Factory calibration art.no.	€	DAkkS calibration art.no.	€
6-8	4	59			<b>508104 0008</b>	<b>342,-</b>			072002 D001	<b>22,-</b>
8-10	4	59			508104 0010	<b>342,-</b>			072002 D001	<b>22,-</b>
10-12	4	59			508104 0012	<b>342,-</b>			072002 D001	<b>22,-</b>
12-16	4	80	<b>508102 0016</b>	<b>331,-</b>	508104 0016	<b>404,-</b>			072002 D001	<b>22,-</b>
16-20	4	80	508102 0020	<b>335,-</b>	508104 0020	<b>415,-</b>			072002 D001	<b>22,-</b>
20-25	4	90	508102 0025	<b>338,-</b>	508104 0025	<b>425,-</b>			072002 D001	<b>22,-</b>
25-30	4	90	508102 0030	<b>361,-</b>	508104 0030	<b>435,-</b>			072002 D002	<b>29,-</b>
30-40	4	98	508102 0040	<b>399,-</b>	508104 0040	<b>451,-</b>			072002 D002	<b>29,-</b>
40-50	4	98	508102 0050	<b>407,-</b>	508104 0050	<b>458,-</b>			072002 D002	<b>29,-</b>
50-63	5	105	508102 0062	<b>450,-</b>	508104 0062	<b>515,-</b>			072002 D002	<b>29,-</b>
62-75	5	105	508102 0075	<b>462,-</b>	508104 0075	<b>538,-</b>			072002 D002	<b>29,-</b>
75-87	5	105	508102 0087	<b>473,-</b>	508104 0087	<b>549,-</b>			072002 D002	<b>29,-</b>
87-100	5	105	508102 0100	<b>500,-</b>	508104 0100	<b>560,-</b>			072002 D002	<b>29,-</b>
100-125	6	158	508102 0125	<b>775,-</b>	508104 0125	<b>839,-</b>			072002 D003	<b>39,-</b>
125-150	6	158	508102 0150	<b>833,-</b>	508104 0150	<b>893,-</b>			072002 D003	<b>39,-</b>
150-175	7	158	508102 0175	<b>915,-</b>	508104 0175	<b>952,-</b>			072002 D003	<b>39,-</b>
175-200	7	158	508102 0200	<b>926,-</b>	508104 0200	<b>985,-</b>			072002 D003	<b>39,-</b>
200-225	8	158	508102 0225	<b>974,-</b>	508104 0225	<b>1.037,-</b>			072002 D003	<b>39,-</b>
225-250	8	158	508102 0250	<b>986,-</b>	508104 0250	<b>1.064,-</b>			072002 D003	<b>39,-</b>
250-275	9	158	508102 0275	<b>1.037,-</b>	508104 0275	<b>1.108,-</b>	073103 W124	<b>56,-</b>		
275-300	9	158	508102 0300	<b>1.167,-</b>	508104 0300	<b>1.222,-</b>	073103 W124	<b>56,-</b>		
			5102		5102					



### Sets

- With ring gauges, extension, key and wrench, with factory certificate for the three-point inside micrometers, in a wooden box
- Calibration including ring gauges, reduced testing

Measurement range mm	Single units mm	Ring gauges mm	Extensions mm	Type A art.no.	€	Type B art.no.	€	DAkkS calibration art.no.	€
6-12	6-8 / 8-10 / 10-12	8 / 10	100			<b>508108 0012</b>	<b>920,-</b>	073103 D035	<b>87,-</b>
12-20	12-16 / 16-20	16	100	<b>508106 0020</b>	<b>724,-</b>	508108 0020	<b>795,-</b>	073103 D031	<b>80,-</b>
20-50	20-25 / 25-30 / 30-40 / 40-50	25 / 40	150	508106 0050	<b>1.673,-</b>	508108 0050	<b>1.823,-</b>	073103 D043	<b>181,-</b>
50-100	50-62 / 62-75 / 75-87 / 87-100	62 / 87	150	508106 0100	<b>2.033,-</b>	508108 0100	<b>2.112,-</b>	073103 D044	<b>204,-</b>
100-200	100-125 / 125-150 / 150-175 / 175-200	125 / 175	150	508106 0200	<b>4.074,-</b>	508108 0200	<b>4.950,-</b>	073103 D042	<b>280,-</b>
				5102		5102			

### Note regarding Mitutoyo digital inside micrometers with three-point contacts

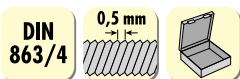
The hole diameter can be measured almost all the way to the base of the hole.



The following distances from the base of the hole cannot be measured:

Measuring range mm	Clearance a mm	
	508102....	508104....
6 - 12	-	2.0
12 - 20	2.6	0.3
20 - 100	3.4	0.3
100 - 300	19.6	12.4

## ATORN® Inside micrometer with three-point contact



- For measuring through-holes, blind bores (from  $\varnothing$  12 mm, dimension a = 0 mm) and short centring shoulders
- Self-centring design
- Carbide-tipped measuring faces from  $\varnothing$  12 mm
- Measuring heads from  $\varnothing$  40 mm with lightweight anodised aluminium construction
- Measuring spindle hardened and ground
- Matt chrome-plated reading parts with an anti-glare finish
- Quick drive with integrated coupling

Blind hole version!



Measurement range mm	Error limit $\mu$ m	a mm	Reading mm	Measurement depth without extension mm	art.no.	€	DAkkS calibration art.no.	€
6-8	4	1.5	0.001	58	507801 0008	390,-	072002 D001	22,-
8-10	4	1.8	0.001	58	507801 0010	390,-	072002 D001	22,-
10-12	4	1.8	0.001	58	507801 0012	390,-	072002 D001	22,-
12-16	4	0	0.001	64	507801 0016	390,-	072002 D001	22,-
16-20	4	0	0.001	64	507801 0020	410,-	072002 D001	22,-
20-25	4	0	0.005	68	507801 0025	430,-	072002 D001	22,-
25-30	4	0	0.005	68	507801 0030	440,-	072002 D002	29,-
30-40	4	0	0.005	76	507801 0040	480,-	072002 D002	29,-
40-50	4	0	0.005	76	507801 0050	480,-	072002 D002	29,-
50-60	5	0	0.005	79	507801 0060	549,-	072002 D002	29,-
60-70	5	0	0.005	79	507801 0070	569,-	072002 D002	29,-
70-85	5	0	0.005	97	507801 0085	599,-	072002 D002	29,-
85-100	5	0	0.005	97	507801 0100	619,-	072002 D002	29,-
100-125	6	0	0.005	132	507801 0125	859,-	072002 D003	39,-
125-150	6	0	0.005	132	507801 0150	999,-	072002 D003	39,-
150-175	7	0	0.005	132	507801 0175	1.079,-	072002 D003	39,-
175-200	7	0	0.005	132	507801 0200	1.129,-	072002 D003	39,-

5176

### Sets

Measurement range mm	Reading mm	Single units mm	Ring gauges mm	art.no.	€	DAkkS calibration art.no.	€
6-12	0.001	6-8 / 8-10 / 10-12	8 / 10	507802 0012	1.099,-	073103 D035	87,-
12-20	0.001	12-16 / 16-20	16	507802 0020	859,-	073103 D031	80,-
20-50	0.005	20-25 / 25-30 / 30-40 / 40-50	25 / 40	507802 0050	1.939,-	073103 D035	87,-
50-100	0.005	50-60 / 60-70 / 70-85 / 85-100	60 / 85	507802 0100	2.279,-	073103 D044	204,-

5176



From  $\varnothing$  12-16 mm measurements to borehole bottom possible



## Mitutoyo ATORN® Extensions

- For extending the measurement depth
- Assembled by screwing in between the measuring head and display component
- 508701.... suitable for inside micrometers with three-point contacts **HOLTEST** and **BOREMATIC**
- 507803.... suitable for **ATORN** inside micrometers with three-point contacts
- **Caution:** After fitting or removing the extension, the inside micrometer with three-point contact must be checked and re-adjusted if necessary.

### Mitutoyo

Extensions mm	for measurement range mm	art.no.	€
100	6-12	508701 0001	100,-
150	12-20	508701 0002	100,-
150	20-50	508701 0003	110,-
150	50-300	508701 0004	190,-

5102

### ATORN®

Extensions mm	for measurement range mm	art.no.	€
75	6-12	507803 0012	92,10
75	12-20	507803 0020	99,20
150	20-30	507803 0030	104,-
150	30-200	507803 0200	127,50

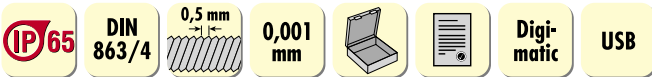
5176



508701....



## Mitutoyo Digital inside micrometers with three-point contacts HOLTEST



- With ratchet
- Readings via LCD display with 7.5 mm high digits
- Casing particularly resistant to oils and chemicals
- Activates automatically when spindle moves
- Measuring faces: up to size 0012, titanium-coated carbide; from size 0016, titanium-coated measuring pins made from hardened steel. Contact point and taper: Carbide
- **Functions:** Pre-set for two values (PRESET), zeroing/absolute (ZERO/ABS), hold value (HOLD), automatic switch-off, battery check
- Supplied in a case with SR44 battery (no. 500534 0001), key and factory certificate
- **Optional accessories:** Digimatic cable type B, no. 563100 0011 (1 m), no. 563100 0012 (2 m), USB cable type B-USB, no. 563110 0002; ring gauges, no. 540135...; extensions, no. 508701....

### Individual

Measurement range mm	Error limit µm	Measurement depth without extension mm	art.no.	€	Factory calibration art.no.	€	DAkkS calibration art.no.	€
6-8	4	54.5	508312 0008	1.059,-			072002 D001	22,-
8-10	4	54.5	508312 0010	1.062,-			072002 D001	22,-
10-12	4	54.5	508312 0012	1.060,-			072002 D001	22,-
12-16	4	78.1	508312 0016	1.184,-			072002 D001	22,-
16-20	4	78.1	508312 0020	1.186,-			072002 D001	22,-
20-25	4	88	508312 0025	1.220,-			072002 D001	22,-
25-30	4	88	508312 0030	1.220,-			072002 D002	29,-
30-40	4	102	508312 0040	1.211,-			072002 D002	29,-
40-50	4	102	508312 0050	1.223,-			072002 D002	29,-
50-63	5	105	508312 0063	1.339,-			072002 D002	29,-
62-75	5	105	508312 0075	1.350,-			072002 D002	29,-
75-88	5	105	508312 0088	1.361,-			072002 D002	29,-
87-100	5	105	508312 0100	1.377,-			072002 D002	29,-
100-125	6	105	508312 0125	1.796,-			072002 D003	39,-
125-150	6	151	508312 0150	1.872,-			072002 D003	39,-
150-175	7	151	508312 0175	1.959,-			072002 D003	39,-
175-200	7	151	508312 0200	2.068,-			072002 D003	39,-
200-225	8	151	508312 0225	2.187,-			072002 D003	39,-
225-250	8	151	508312 0250	2.252,-			072002 D003	39,-
250-275	9	151	508312 0275	2.318,-	073103 W124	56,-		
275-300	9	151	508312 0300	2.433,-	073103 W124	56,-		

5102



### Sets

- With ring gauges, batteries and wrench in wooden box with factory certificate for the three-point inside micrometers
- Calibration including ring gauges, reduced testing

Measurement range mm	Single units mm	Ring gauges mm	art.no.	€	DAkkS calibration art.no.	€
6-12	6-8 / 8-10 / 10-12	8 / 10	508314 0012	2.783,-	073103 D035	87,-
12-25	12-16 / 16-20 / 20-25	16 / 20	508314 0025	3.093,-	073103 D035	87,-
25-50	25-30 / 30-40 / 40-50	30 / 40	508314 0050	3.259,-	073103 D035	87,-
50-75	50-63 / 63-75	62	508314 0075	2.563,-	073103 D001	102,-
75-100	75-88 / 87-100	87	508314 0100	3.106,-	073103 D001	102,-

5102



### Sets with replaceable measuring heads

- With ring gauges, extension, batteries and wrench
- In wooden box with factory certificate for the three-point measuring heads
- Calibration including ring gauges, reduced testing

Measurement range mm	Measuring heads mm	Extensions mm	Ring gauges mm	art.no.	€	DAkkS calibration art.no.	€
6-12	6-8 / 8-10 / 10-12	100	8 / 10	508316 0012	1.951,-	073103 D035	87,-
12-20	12-16 / 16-20	150	16	508316 0020	1.599,-	073103 D031	80,-
20-50	20-25, 25-30 / 30-40 / 40-50	150	25 / 40	508316 0050	2.550,-	073103 D043	181,-
50-100	50-63, 62-75 / 75-88 / 87-100	150	62 / 87	508316 0100	3.647,-	073103 D044	204,-
100-200	100-125 / 125-150 / 150-175 / 175-200	150	125 / 175	508316 0200	5.537,-	073103 D042	280,-

5102



## Mitutoyo Inside micrometers with three-point contacts BOREMATIC

ABSOLUTE®

0,001 mm ABSOLUTE Digi-matic USB

- For fast and precise series measurements
- Base body with operating handle for quick adjustment
- Extremely easy to read with 11 mm high digits
- Display component can be rotated through 330°
- Allows two pre-set values to be input
- Measuring faces: up to size 0012, titanium-coated carbide; from size 0016, titanium-coated measuring pins made from hardened steel. Contact point and taper: Carbide
- Error margin: Measuring range 6 - 20 mm,  $\varnothing = 0.005$  mm; measuring range 20 - 125 mm  $\varnothing = 0.006$  mm
- **Functions:** MODE to switch between tolerance, factor and pre-set modes  
SET to confirm input  
DATA/ON/OFF  
Battery check
- Supplied with SR44 battery (no. 500534 0001), key and factory certificate
- **Optional accessories:** Digimatic cable type F, no. 563100 0051 (1 m), no. 563100 0052 (2 m); USB cable type F-USB, no. 563110 0006; ring gauge, no. 540135....; extensions, no. 508701....



### Individual

Measurement range mm	Measurement depth without extension mm	art.no.	€	DAkkS calibration art.no.	€
6-8	83	508507 0008	1.212,-	072002 D001	22,-
8-10	83	508507 0010	1.212,-	072002 D001	22,-
10-12	83	508507 0012	1.212,-	072002 D001	22,-
12-16	52.6	508507 0016	1.237,-	072002 D001	22,-
16-20	52.6	508507 0020	1.237,-	072002 D001	22,-
20-25	58.2	508507 0025	1.318,-	072002 D001	22,-
25-30	58.2	508507 0030	1.318,-	072002 D002	29,-
30-40	67.3	508507 0040	1.431,-	072002 D002	29,-
40-50	67.3	508507 0050	1.431,-	072002 D002	29,-
50-63	74.8	508507 0063	1.495,-	072002 D002	29,-
62-75	74.8	508507 0075	1.526,-	072002 D002	29,-
75-88	74.8	508507 0088	1.575,-	072002 D002	29,-
87-100	74.8	508507 0100	1.575,-	072002 D002	29,-
100-113	74.8	508507 0113	1.668,-	072002 D003	39,-
112-125	74.8	508507 0125	1.694,-	072002 D003	39,-

5102



### Sets with replaceable measuring heads

- With adapters, measuring inserts and ring gauges, in wooden box, including battery and wrench, with factory certificate for the Borematic measuring heads
- Calibration including ring gauges, reduced testing



508508 0012

Measurement range mm	Measuring heads mm	Adapter	Ring gauges mm	art.no.	€	DAkkS calibration art.no.	€
6-12	6-8 / 8-10 / 10-12	1	8 / 10	508508 0012	1.748,-	073103 D035	87,-
12-25	12-16 / 16-20 / 20-25	2	16 / 20	508508 0025	1.877,-	073103 D035	87,-
25-50	25-30 / 30-35 / 40-50	1	30 / 40	508508 0050	2.208,-	073103 D035	87,-
50-100	50-63 / 62-75 / 75-88 / 87-100	1	62 / 87	508508 0100	3.752,-	073103 D044	204,-

5102



Continued on next page >>>

The hole diameter can be measured almost all the way to the base of the hole.



The following distances from the base of the hole cannot be measured:

Measuring range mm	Clearance a mm
6 - 12	2.0
12 - 125	0.3



**Replaceable measuring heads for BOREMATIC**

- For extending the measurement range of standard measuring instruments
- Can only be used in combination with a suitable adapter (508506....)

Measurement range mm	suitable adapter	art.no.	€
6-8	5085060012	<b>508504 0008</b>	<b>288,-</b>
8-10	5085060012	508504 0010	288,-
10-12	5085060012	508504 0012	288,-
12-16	5085060020	508504 0016	257,-
16-20	5085060020	508504 0020	257,-
20-25	5085060050	508504 0025	278,-
25-30	5085060050	508504 0030	278,-
30-40	5085060050	508504 0040	301,-
40-50	5085060050	508504 0050	301,-
50-63	5085060125	508504 0063	344,-
62-75	5085060125	508504 0051	356,-
75-88	5085060125	508504 0088	366,-
87-100	5085060125	508504 0100	399,-



5102

**Adapter**

- A suitable adapter for the measurement range of the replaceable measuring head must be selected

suitable for measurement range mm	art.no.	€
6-12	<b>508506 0012</b>	<b>135,-</b>
12-20	508506 0020	34,-
20-50	508506 0050	34,-
50-125	508506 0125	34,-



5102

**Mitutoyo Internal precision instrument**

Werknorm



- Comparative measurement with reference to a pre-set reference dimension
- Set by means of outside micrometers, ring gauges or adjustable reference gauges with gauge blocks.
- With analogue dial indicator, can be replaced with a digital dial indicator (optional accessory)
- With movable stylus, carbide-tipped, measuring span 1.6 mm
- Replaceable carbide-tipped measuring bolts, sizes 0010 and 0018 hardened
- **Size 0150** with additional 50 mm extension for Ø range 100 - 150 mm
- Accuracy without an indicating measuring instrument
- Calibration includes dial indicator
- Supplied with base unit, set of measuring inserts with shims, analogue dial indicator with plastic protector



526502 0160

Measurement range mm	Reading mm	Accuracy mm	Number of measurement spindles	Measuring depth mm	art.no.		Factory calibration		DAkkS calibration	
					art.no.	€	art.no.	€	art.no.	€
6-10	0.01	0.005	9	47	<b>526502 0010</b>	<b>448,-</b>			073103 D077	<b>56,-</b>
10-18	0.01	0.005	9	100	526502 0018	432,-			073103 D277	56,-
18-35	0.01	0.002	9	100	526502 0035	263,-			073103 D077	56,-
35-60	0.01	0.002	6	150	526502 0060	266,-			073103 D077	56,-
50-150	0.01	0.002	11	150	526502 0150	275,-			073103 D074	56,-
100-160	0.01	0.002	13	150	526502 0160	440,-			073103 D074	56,-
160-250	0.01	0.002	6	250	526502 0250	538,-			073103 D075	56,-
250-400	0.01	0.002	5	250	526502 0400	647,-	073103 W076	48,-		
6-10	0.001	0.005	9	47	526504 0010	502,-			073103 D077	56,-
10-18	0.001	0.005	9	100	526504 0018	500,-			073103 D277	56,-
18-35	0.001	0.002	9	100	526504 0035	318,-			073103 D277	56,-
35-60	0.001	0.002	6	150	526504 0060	324,-			073103 D077	56,-
50-150	0.001	0.002	11	150	526504 0150	334,-			073103 D074	56,-
100-160	0.001	0.002	13	150	526504 0160	505,-			073103 D074	56,-
160-250	0.001	0.002	6	250	526504 0250	609,-			073103 D075	56,-
250-400	0.001	0.002	5	250	526504 0400	718,-	073103 W076	48,-		



5102

**Sets with analogue dial indicator**

- 3 base units with measurement ranges of 18 - 35 mm, 35 - 60 mm and 50 - 150 mm, all measuring bolts with

Measurement range mm	Reading mm	Accuracy mm	art.no.	€	DAkkS calibration art.no.	€
18-150	0.01	0.002	526553 0150	459,-	073103 D037	136,-
18-150	0.001	0.002	526555 0150	526,-	073103 D037	136,-

5102



**Set with digital dial indicator**

- 3 base units with measurement ranges of 18 - 35 mm, 35 - 60 mm and 50 - 150 mm, all measuring bolts with shims, SR44 battery no. 500534 0001

**Dial indicator functions:**

- Display component can be rotated through 330°
- ON/OFF
- START for initiating reversal point search
- TOL for inputting tolerance values
- PRESET user-defined values in the display
- DATA/HOLD data transfer key if signal cable is connected, otherwise hold key for locking the display
- MENU for accessing and changing the three stored target values
- **Optional accessories:** Digimatic cable type F, no. 563100 0051 (1 m), no. 563100 0052 (2 m); USB cable type F-USB, no. 563110 0006



Measurement range mm	Reading mm	Accuracy mm	art.no.	€	DAkkS calibration art.no.	€
18-150	0.001	0.002	526554 0150	877,-	073103 D038	142,-

5102

**Extensions for larger measurement depths**

Extensions mm	suitable for measurement range mm	art.no.	€
125	18-35	527520 0001	198,-
250	18-35	527520 0002	221,-
500	18-35	527520 0003	343,-
125	35-160	527520 1001	216,-
250	35-160	527520 1002	236,-

5102

Extensions mm	suitable for measurement range mm	art.no.	€
500	35-160	527520 1003	424,-
750	35-160	527520 1004	564,-
1000	35-160	527520 1005	782,-
125	160-400	527520 2001	221,-
250	160-400	527520 2002	226,-

5102



Extensions mm	suitable for measurement range mm	art.no.	€
500	160-400	527520 2003	535,-
750	160-400	527520 2004	703,-
1000	160-400	527520 2005	923,-

5102



**Adjustment device ESU**

- For exact adjustment of all internal precision instruments by means of the corresponding gauge block to the desired target dimension
- Can be used both horizontally and vertically
- Measuring jaws made from solid carbide, gauge block grade
- With lock lever for quickly securing the gauge block combination
- \* = without taking into account gauge block quality



Adjustment range mm	Adjustment uncertainty mm	art.no.	€
4.5-160	0.002*	528010 0160	949,-
18-290	0.002*	528010 0290	939,-

5126



## Bore gauge OD

- Robust and easy-to-use two-point comparative measuring instrument
- For series inspections of  $\varnothing$  3.1 to 110mm bores
- High-precision measuring sleeve ensures optimum centring inside the bore
- Repeat precision 1 $\mu$ m
- Measuring span 0.2mm ( $\varnothing$  3.1 to 6.0 = 0.15mm)
- Measuring force 1 - 2N
- Carbide measuring probes, other materials available on request
- Suitable for measuring with indicating callipers, dial indicators or electric probes
- Connecting thread holder/gauge M11 x 0.75
- \* = nominal dimension range up to  $\varnothing$  4mm H = 26mm, from  $\varnothing$  4.01 up to 6mm H = 10mm
- **The following is required for a complete bore gauge OD: Bore gauge (526557.../526558...) + holder (526559...) + indicating measuring instrument + suitable ring gauge**
- Greater diameter, indicating measuring instrument and suitable ring gauges available on request
- Supplied without indicating measuring instrument and ring gauges

### Standard bore gauge OD

- **Caution:** Please specify the nominal dimension and tolerance of the bore when placing your order!  
Examples: No. 526557 0006 / 4 +0.02 / -0.01  
No. 526557 0020 / 18H7

Nominal dimension range mm	h mm	H mm	art.no.	€	DAkkS calibration art.no.	€
3.1-6.0	1.5	26/10*	526557 0006	295,-	075011 D001	40,-
6.1-12.0	2.5	15	526557 0012	212,-	075011 D001	40,-
12.1-20.0	2.5	15	526557 0020	215,-	075011 D001	40,-
20.1-30.0	3.5	20	526557 0030	257,-	075011 D001	40,-
30.1-40.0	3.5	20	526557 0040	339,-	075011 D001	40,-
40.1-60.0	3.5	28	526557 0060	395,-	075011 D001	40,-
60.1-80.0	4.0	33	526557 0080	430,-	075011 D001	40,-
80.1-100.0	4.0	33	526557 0100	460,-	075011 D001	40,-
100.1-110.0	4.0	33	526557 0110	495,-	075011 D001	40,-

5126

### Bore gauge OD For blind holes

- **Caution:** Please specify the nominal dimension and tolerance of the bore when placing your order!  
Examples: No. 526558 0006 / 4 +0.02 / -0.01  
No. 526558 0020 / 18H7

Nominal dimension range mm	h mm	H mm	art.no.	€	DAkkS calibration art.no.	€
3.1-6.0	1.0	26/10*	526558 0006	405,-	075011 D001	40,-
6.1-12.0	1.0	15	526558 0012	322,-	075011 D001	40,-
12.1-20.0	1.0	15	526558 0020	326,-	075011 D001	40,-
20.1-30.0	1.2	20	526558 0030	370,-	075011 D001	40,-
30.1-40.0	1.2	20	526558 0040	509,-	075011 D001	40,-
40.1-60.0	1.2	28	526558 0060	609,-	075011 D001	40,-
60.1-80.0	1.2	33	526558 0080	629,-	075011 D001	40,-
80.1-100.0	1.2	33	526558 0100	679,-	075011 D001	40,-
100.1-110.0	1.2	33	526558 0110	719,-	075011 D001	40,-

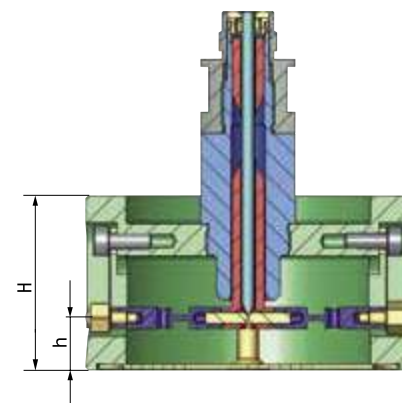
5126

### OD Device holder

- M11 x 0.75 connection thread suitable for all OD bore gauges
- Size 0004 and 0005 reinforced with  $\varnothing$  18 mm tubing, recommended for OD bore gauges > 60 mm
- Size 0006 with retractor, recommended for blind hole bore gauges

L mm	Pipe $\varnothing$ mm	art.no.	€
50	12	526559 0001	63,10
105	12	526559 0002	128,50
235	12	526559 0003	148,50
145	18	526559 0004	158,50
235	18	526559 0005	179,-
70	12	526559 0006	208,-

5126



## OD bore gauges, special design and accessories

### You require

- Bore gauges for through-holes
- Bore gauges in special forms
- Measuring probe jewelled or hard-chrome plated for surfaces sensitive to scratching
- Depth stoppers
- Angle pieces
- Measurement depth extensions

Solutions not provided in our catalogue are also available on request. Please contact us, our technicians will be glad to advise you.



## Mitutoyo Internal precision instrument



- For tasks such as measuring extremely small bores (from Ø 0.95 mm)
- Comparative measurement with reference to a pre-set reference dimension
- With dial indicator and expansion measuring heads
- Measuring heads from Ø 0.95 to 7.0 mm with a hard chrome-plated finish, and Ø 7.0 to 18 mm made from hardened gauge steel similar to measuring needles
- Dial indicator can be replaced with a digital dial indicator including a data output (optional accessory)
- \* = Measurement depth: Measurement range 1.5 - 2.25 mm = 17.5 mm, measurement range 2.25 - 4.00 mm = 22.5 mm
- Calibration includes dial indicator
- Supplied in a case with base unit, set of measuring heads, measuring needle, analogue dial indicator including plastic protector, and assembly key



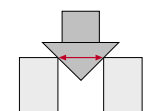
Measurement range mm	Reading mm	Number of measurement heads	Measuring depth mm	art.no.	€
0.95-1.55	0.001	5	11.5	526001 0001	950,-
1.50-4.00	0.001	9	17.5/22.5*	526001 0002	1.139,-
3.70-7.30	0.001	7	32	526001 0003	894,-
7.00-10.00	0.001	6	56	526001 0004	374,-
10.00-18.00	0.001	8	62	526001 0005	402,-

5102

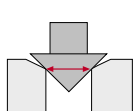
## IFM chamfer IFM

0,01 mm

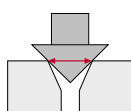
- For determining the largest diameter of internal chamfers or tapers
- Direct readings (no conversion) from the special dial indicator
- 90° measuring taper



Boreholes with sharp edges



Internal taper > 90°



Internal taper < 90°



suitable for 512017....



Measurement range mm	art.no.	€
0.5-20	512019 1020	385,-
20-40	512019 1040	559,-

5126

Over 200,000 tools available online!

### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

[www.saratools.com](http://www.saratools.com)

## ATORN® Universal measuring instrument UNICHECK

INFO

The comparative measuring instrument UNICHECK, for external and internal measurements, is a versatile precision measuring instrument for efficient use in production and measuring rooms.

The wide range of measuring probes and measuring inserts gives the UNICHECK

enormous versatility in the most diverse measurement tasks. The UNICHECK is used to both test workpieces and adjust machines.

Internal and external dimensions on shafts and parallel surfaces, recesses, grooves, dovetail guides and toothing are all tested. Internal and external threads can also be measured.

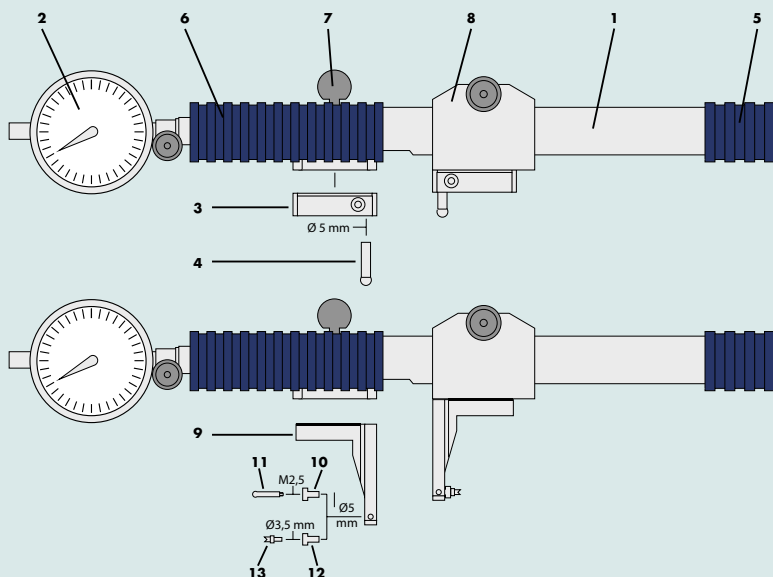
The measuring direction required for external or internal measuring can be quickly and easily adjusted at a touch.

Dial indicator, precision dial or electronic displacement transducer with a clamping shank  $\varnothing 8$  h6 can be used to display measured values, where necessary and required.



**Flexible  
Exact  
Universal**

### Device setup

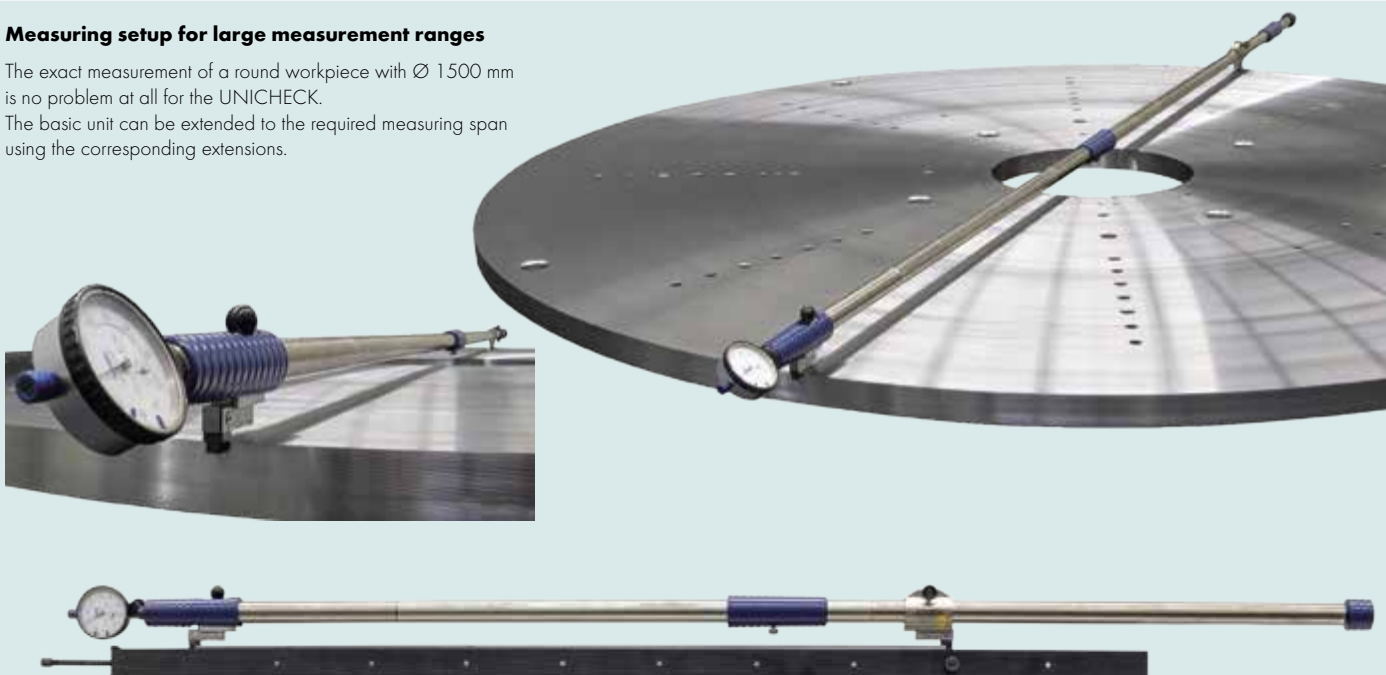


1. Basic unit
2. Display unit (dial indicator, precision dial or electronic displacement transducer)
3. Measuring probe mount, locating bore  $\varnothing 5$  mm
4. Measuring probe shank  $\varnothing 5$  mm
5. Protective cap
6. Heat protection handle
7. Control lever
8. Slider with mount for fixed probe
9. Measuring arm for horizontal measurements, locating bore  $\varnothing 5$  mm
10. Adapter  $\varnothing 5$  mm, with connecting thread M2.5
11. Special-purpose contact point M2.5
12. Adapter  $\varnothing 5$  mm, with locating bore  $\varnothing 3.5$  mm
13. Thread measuring insert, shank  $\varnothing 3.5$  mm

### Measuring setup for large measurement ranges

The exact measurement of a round workpiece with  $\varnothing 1500$  mm is no problem at all for the UNICHECK.

The basic unit can be extended to the required measuring span using the corresponding extensions.

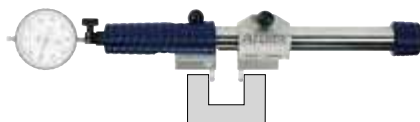


The zero setting can be performed using a gauge block combination and a gauge block holder.

# ATORN® Universal measuring instrument UNICHECK



- For carrying out a wide range of measuring tasks such as external and internal measurements, external and internal threads, external and internal tothing
- Adjustments are performed using an adjustment device, master, gauge block combination, ring gauge or outside micrometer
- Rugged tubular design
- Adjustable fixed measuring jaw
- Movable arm for internal and external measurements, reversible measuring direction, measuring range 15 mm
- Universal application by attaching a wide variety of measuring arms and probe tips (optional accessories)
- Measurement range extendable to 2000 mm using extensions (optional accessories)
- Choice of display via analogue or digital dial indicator (optional accessories)
- Supplied in a wooden case (without probe holding fixtures, probes or dial indicator)



Application example: with dial indicator, measuring probe holding fixture, ball tip measuring probe Ø 6 mm



Sample set configuration



Measurement range outside/inside mm	Measuring force outside / inside N	Weight kg	art.no.	€
5 - 220 / 15 - 230	4 / 6	2.7	<b>500807</b> 0001	<b>2.089,-</b>

5180

## Extensions

Designation	art.no.	€
Measurement range extension 100 mm	<b>500808</b> 1100	<b>295,-</b>
Measurement range extension 200 mm	500808 1200	<b>316,-</b>
Measurement range extension 500 mm	500808 1500	<b>480,-</b>

5180



500808 1500



500808 1200



500808 1100

## Probe holder for vertical installation (pair)

Designation	art.no.	€
Measuring probe mount	<b>500808</b> 1001	<b>203,-</b>

5180



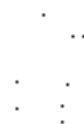
Compatible with measuring probe mount 500808 1001



## Shoulder gauge slides, internal measurement (pair)

Designation	Shank Ø mm	art.no.	€
Measuring probe for short shoulders, internal	5	<b>500808</b> 1007	<b>203,-</b>

5180



Compatible with measuring probe mount 500808 1001

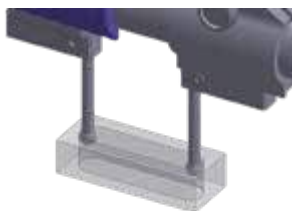
Continued on next page >>>



**Shoulder gauge slides, external measurement (pair)**

Designation	Shank Ø mm	art.no.	€
Measuring probe for short shoulders, external	5	<b>500808</b> 1008	234,-

5180



**Measuring probe, ball, Ø 6 mm (pair)**

Designation	L mm	Shank Ø mm	art.no.	€
Measuring probe, ball, Ø 6 mm, short	23	5	<b>500808</b> 1005	132,50
Measuring probe, ball, Ø 6 mm, long	53	5	500808 1006	132,50

5180



**Disc probes (pair)**

Designation	L mm	Shank Ø mm	art.no.	€
Measuring probe, disc	42	5	<b>500808</b> 1009	132,50

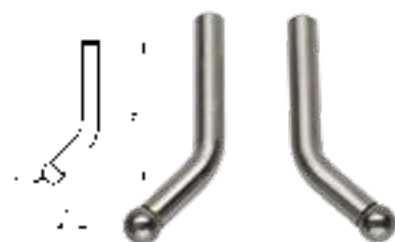
5180



**Measuring probe, ball, Ø 6 mm, offset (pair)**

Designation	Projection mm	Shank Ø mm	art.no.	€
Measuring inserts offset with rounded sensor surfaces Ø 6 mm	11	5	<b>500808</b> 2002	219,-

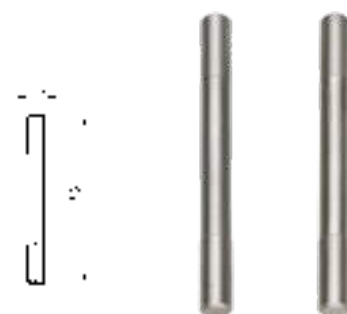
5180



**Straight probe (pair)**

Designation	L mm	Shank Ø mm	art.no.	€
Straight measuring inserts, Ø 5 mm, L = 52 mm	52	5	<b>500808</b> 2001	132,50

5180

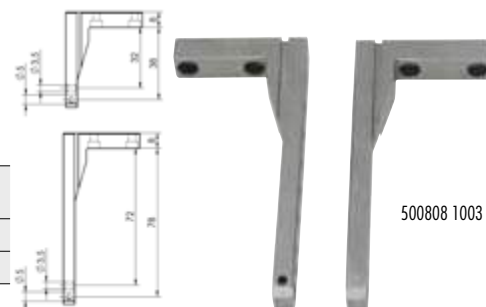




**Measurement arms (pair) for external and internal measurements**

Designation	L mm	Holding fixture Ø mm	art.no.	€
Measuring arms, short	40	5	<b>500808 1002</b>	<b>305,-</b>
Measuring arms, long	80	5	<b>500808 1003</b>	<b>370,-</b>

5180



500808 1003



**Depth stops (pair)**

Designation	Dimensions	suitable for	art.no.	€
Depth stop	34x30	5008081002 / 5008081003	<b>500808 1004</b>	<b>288,-</b>

5180



**Adapter M2.5 (pair) for attaching dial gauge special probe tips with connecting thread M2.5 x 0.45**

Designation	Shank Ø mm	art.no.	€
Adapter	5	<b>500808 1012</b>	<b>103,-</b>

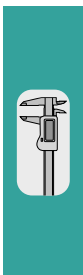
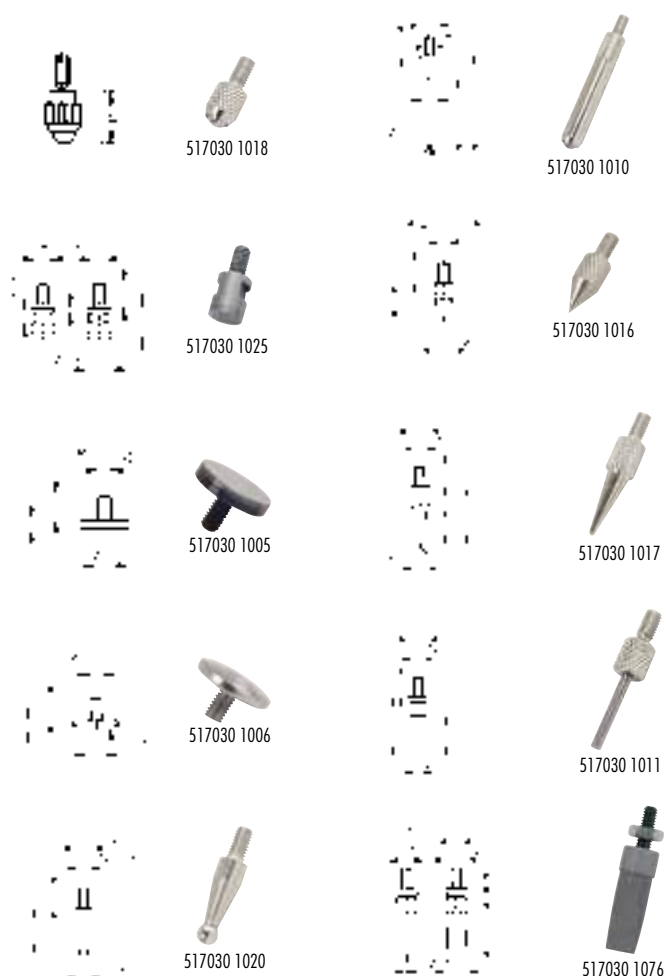
5180

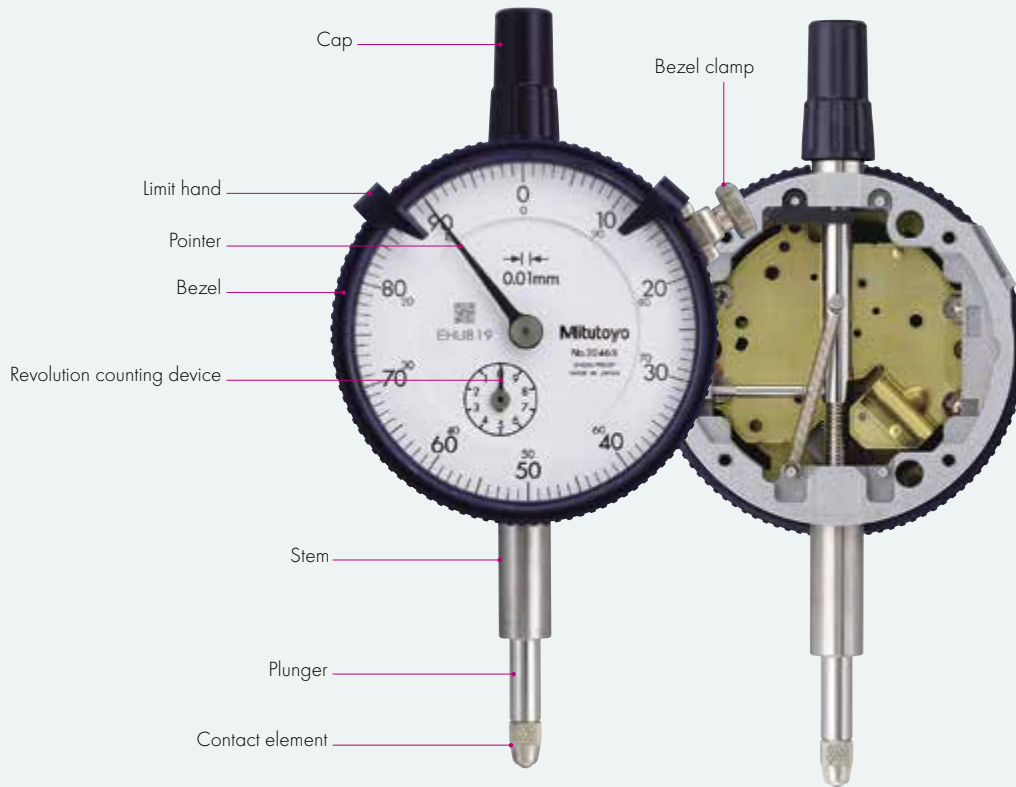


**Special-purpose contact points**

Probe point design	Material probe point	Ø mm	L mm	art.no.	€
Ball (standard measurement end)	Steel	3	-	<b>517030 1018</b>	<b>1,-</b>
Ball (standard measurement end)	Carbide	3	-	<b>517030 1029</b>	<b>4,88</b>
Ball (standard measurement end)	Ruby	3	-	<b>517030 1060</b>	<b>9,10</b>
Flat	Steel	4.8	-	<b>517030 1002</b>	<b>4,40</b>
Flat	Carbide	4.8	-	<b>517030 1025</b>	<b>28,50</b>
Flat	Steel	10	-	<b>517030 1005</b>	<b>4,94</b>
Flat	Steel	20	-	<b>517030 1007</b>	<b>19,55</b>
Flat	Steel	30	-	<b>517030 1012</b>	<b>19,55</b>
Flat	Carbide	10	-	<b>517030 1027</b>	<b>49,40</b>
Spherical	Steel	10	-	<b>517030 1006</b>	<b>6,35</b>
Ball	Steel	1	-	<b>517030 1051</b>	<b>7,60</b>
Ball	Steel	2	-	<b>517030 1052</b>	<b>7,60</b>
Ball	Steel	3	-	<b>517030 1020</b>	<b>7,60</b>
Ball	Steel	4	-	<b>517030 1054</b>	<b>7,60</b>
Ball	Steel	5	-	<b>517030 1055</b>	<b>7,60</b>
Ball	Steel	6	-	<b>517030 1056</b>	<b>7,60</b>
Ball	Carbide	1	-	<b>517030 1081</b>	<b>23,80</b>
Ball	Carbide	2	-	<b>517030 1082</b>	<b>23,80</b>
Ball	Carbide	3	-	<b>517030 1080</b>	<b>23,80</b>
Ball	Carbide	4	-	<b>517030 1084</b>	<b>23,80</b>
Ball	Carbide	5	-	<b>517030 1085</b>	<b>23,80</b>
Ball	Carbide	6	-	<b>517030 1086</b>	<b>23,80</b>
Ball	Steel	3	26	<b>517030 1010</b>	<b>3,72</b>
Ball	Carbide	3	26	<b>517030 1040</b>	<b>12,80</b>
Tapered	Steel	-	-	<b>517030 1016</b>	<b>5,95</b>
Pointed tip	Steel	-	-	<b>517030 1017</b>	<b>5,65</b>
Cylindrical	Steel	-	40	<b>517030 1008</b>	<b>10,90</b>
Cylindrical	Steel	-	11	<b>517030 1011</b>	<b>7,95</b>
Cylindrical	Carbide	-	11	<b>517030 1070</b>	<b>29,20</b>
Blade	Carbide	-	-	<b>517030 1076</b>	<b>63,60</b>

5102



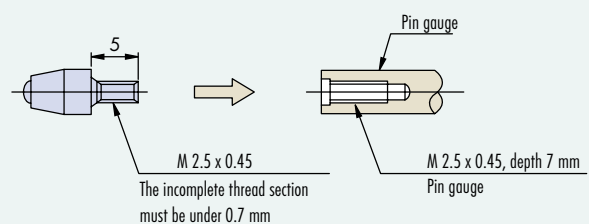


Assembly

Stem Assembly	Method	<p>Clamp the stem with a clamping screw</p>	<p>Clamping the stem by split-clamp fastening</p>
	Note	<ul style="list-style-type: none"> <li>Mounting hole tolerance: <math>\varnothing 8G7 (+0.005 \text{ to } 0.02)</math></li> <li>Clamping screw M4 to M6</li> <li>Clamping position: 8 mm or more from the lower side of the stem</li> <li>Maximum torque: 150N-cm when clamping with a single M5 screw</li> <li>Note that excessive clamping torque may adversely affect the spindle movement.</li> </ul>	<ul style="list-style-type: none"> <li>Mounting hole tolerance: <math>\varnothing 8G7 (+0.005 \text{ to } 0.02)</math></li> </ul>
Fixing with a mounting lug	Method	<p>M6 screw Flat washer</p>	
	Note	<ul style="list-style-type: none"> <li>Depending on the application, the mounting lugs can be changed in orientation by 90 degrees. (Setting of lug on delivery: horizontal)</li> <li>The mounting lugs of the models of series 1 (No. 1911, 1913-10&amp;1003) cannot, however, be adjusted horizontally.</li> <li>To prevent cosine-effect error, ensure that the measuring spindle is positioned at right angles to the surface to be measured (with the spindle itself in line with the measuring direction).</li> </ul>	

Contact element

- Standardised screw thread M 2.5 x 0.45 (length: 5 mm).
- When producing a contact point, the incomplete thread section at the root of the screw must be less than 0.7 mm.





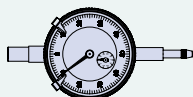
## Dial indicators

INFO



Measuring stage

Contact point down  
(normal position)



Measuring stage

Plunger horizontal  
(measuring direction lateral)



Measuring stage

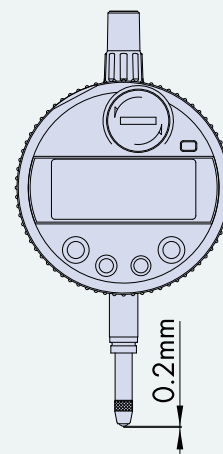
Contact point up (contrary to  
standard-measurement direction)

## Effect of alignment on the measuring force

- In measurements with a horizontal or upwards measuring direction, the measuring force is low compared to the standard measuring direction (downwards). In these cases, the repeatability must be verified.

## Setting the zero point on a digital dial indicator

The range of 0.2 mm at the end of the spindle stroke is not specified. Make sure that the spindle is raised by at least 0.2 mm when setting the zero point.



## Caring for the spindle

- The spindle must not be lubricated. Otherwise dust may stick to it and cause errors.
- If the spindle is stiff, wipe it with a dry cloth or a cloth soaked in alcohol. If this leads to no improvement, consult Mitutoyo for repairs.
- Before you perform a measurement or calibration, ensure that the spindle can easily move up and down, and check the zero point for stability.

THE **BENCHMARK**  
STANDARD

Mitutoyo



MITUTOYO  
Measuring equipment  
catalogue  
approx. 620 pages  
Art.no. 019900 0069

Overview of all free manufacturers' catalogues  
on page 16/17

**SARA® Dial indicator****DIN 878****0,01 mm**

- Matt chrome-plated metal housing
- Rotatable outer ring for zeroing
- Two adjustable inner tolerance marks
- Probe tip thread: M2.5
- Clamping shank Ø: 8 mm
- Optional ring clamp, self-locking or with clamping screw
- Supplied in moulded packaging

Measurement range mm	Division mm	External ring Ø mm	Ring clamping			DAkkS calibration	
				art.no.	€	art.no.	€
10	0.01	58	No	510101 1002	22,30	073009 D003	19,-
10	0.01	58	Yes	510101 1005	22,30	073009 D003	19,-

5121

**ATORN® Dial indicators with ceramic probe balls, shock-resistant****DIN 878****0,01 mm**

- Measuring force max. 1.3 N
- Non-magnetic and non-conductive measuring insert
- Dimensions in accordance with DIN EN ISO 463 Issue 6/2006
- Metal housing
- With shock protection
- Rotatable metal outer ring for zeroing
- Two adjustable inner tolerance marks
- Probe tip thread: M2.5
- Clamping shank Ø: 8 mm
- Supplied in a case

**Standard version**

Measurement range mm	Division mm	External ring Ø mm	Measurement route per rotation of indicator mm	Number of rotation counters			DAkkS calibration	
					art.no.	€	art.no.	€
10	0.01	58	1	Round	511006 0010	44,30	073009 D003	19,-
10	0.01	58	1	Concentric	511006 1010	63,10	073009 D003	19,-
25	0.01	58	1	Concentric	511006 1025	106,-	073009 D004	22,-

5192

**Compact dial indicator**

- 511007 1005 without shock proofing

Measurement range mm	Division mm	External ring Ø mm	Measurement route per rotation of indicator mm	Number of rotation counters			DAkkS calibration	
					art.no.	€	art.no.	€
5	0.01	40	0.5	Round	511007 0005	54,50	073009 D002	18,-
10	0.01	40	1.0	Concentric	511007 1005	80,40	073009 D003	19,-

5192



511007 0005

**Käfer Dial indicator, oil and water-tight, shock-proof****IP67****DIN 878****0,01 mm**

- Dimensions in accordance with DIN EN ISO 463 Issue 6/2006 (except L2 = 39.5 mm)
- **Oil and water-tight / IP67 protection rating**
- **With shock proofing**
- Outer ring can be rotated through 360°
- Two adjustable tolerance marks
- Probe tip thread M2.5
- Clamping shank Ø 8 mm

**Standard version**

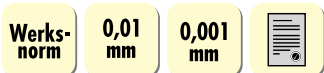
Measurement range mm	Division mm	External ring Ø mm	Measurement route per rotation of indicator mm	Measuring force max. N			DAkkS calibration	
					art.no.	€	art.no.	€
10	0.01	61.5	1	1.6	511008 0010	108,50	073009 D003	19,-

5102



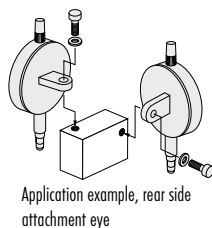
511008 0010

## Mitutoyo Dial indicators



### • 0.01 mm or 0.001 mm readings

- Casing made from oil-resistant plastic
- Completely free of through-holes for improved dirt protection
- Back cover: flat or with mounting lug
- Rotatable outer ring for zeroing, fixed by means of a clamping screw
- Two adjustable tolerance marks
- Surface-hardened watch glass
- Damped end point
- Robust spindle, Ø 4.8 mm
- New clamping shank easily secures the entire length
- Contact point thread M2.5
- Clamping shank Ø 8 mm
- Supplied in moulded packaging



### Compact dial indicator, 0.01 mm, outer ring Ø 40 mm

- Movement range 1 mm per pointer rotation

Measurement range mm	Division mm	Attachment eye	Accuracy fe µm	Measuring force max. N	Protection type	art.no.	€	DAkkS calibration art.no.	€
5	0.01	No	12	1.4	No protection rating	511001 0003	56,-	073009 D002	18,-
5	0.01	No	12	2.0	IP 63	511001 0004	108,-	073009 D002	18,-
5	0.01	Rear side	12	1.4	No protection rating	511001 0012	59,-	073009 D002	18,-

5102

### Compact dial indicator 0.001 mm, outer ring Ø 40 mm

- Jewel bearing

Measurement range mm	Division mm	Attachment eye	Measurement route per rotation of indicator mm	Accuracy fe µm	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
1	0.001	Rear side	0.2	4	1.5	511002 0001	167,-	073009 D001	16,-
1	0.001	-	0.2	4	1.5	511002 0002	167,-	073009 D001	16,-

5102

### Standard dial indicator, 0.01 mm, outer ring Ø 57 mm

- Movement range 1 mm per pointer rotation

Measurement range mm	Division mm	Attachment eye	Accuracy fe µm	Measuring force max. N	Shock-proof	art.no.	€	DAkkS calibration art.no.	€
10	0.01	No	15	1.4	Yes	511010 0012	62,-	073009 D003	19,-
10	0.01	No	12	1.4	No	511010 0014	36,-	073009 D003	19,-
20	0.01	No	25	2.0	Yes	511010 0016	93,-	073009 D004	22,-
30	0.01	No	30	2.5	Yes	511010 0017	119,-	073009 D005	24,-
10	0.01	Rear side	12	1.4	No	511010 0101	36,-	073009 D003	19,-

5102

### Standard dial indicator 0.01 / 0.001 mm, outer ring Ø 57 mm, IP64 protection rating

Measurement range mm	Division mm	Measurement route per rotation of indicator mm	Accuracy fe µm	Measuring force max. N	Shock-proof	Protection type	art.no.	€	DAkkS calibration art.no.	€
1	0.001	0.1	3	2.0	Yes	IP 64	511015 0001	162,-	073009 D001	16,-
10	0.01	1	12	2.5	No	IP 64	511015 0003	125,-	073009 D003	19,-

5102

### Precision dial indicator 0.001 mm, outer ring Ø 57 mm

- Jewel bearing
- Shock-resistant

Measurement range mm	Reading mm	Measurement route per rotation of indicator mm	Accuracy fe µm	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
1	0-100-0	0.2	3	1.5	511010 0001	93,-	073009 D001	16,-
1	0-100 (100-0)	0.1	3	1.5	511010 0002	121,-	073009 D001	16,-
2	0-100-0	0.3	5	1.5	511010 0003	130,-	073009 D001	16,-

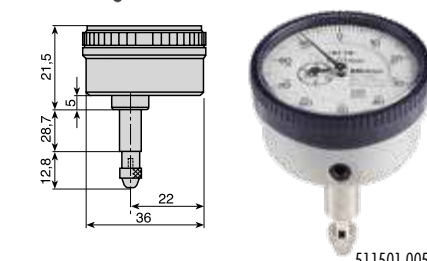
5102

### Dial indicator, 0.01 mm, outer ring Ø 39 mm

- Rear spindle

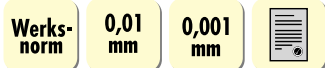
Measurement range mm	Division mm	Measurement route per rotation of indicator mm	Accuracy fe µm	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
5	0.01	1	15	1.4	511501 0050	122,-	073009 D002	18,-

5102



511501 0050

## Mitutoyo Safety dial indicator, shock-resistant



- Single-revolution pointer avoids measurement errors by eliminating the need to take note of a second scale for pointer rotations
- Two adjustable tolerance marks
- Outer ring can be rotated to facilitate zeroing
- Shock-resistant
- Probe tip thread: M2.5
- Clamping shank  $\varnothing$  8 mm
- Supplied in moulded packaging

### Scale division 0.01 mm

- Spindle stroke 3.5 mm

Measurement range mm	Division mm	External ring $\varnothing$ mm	Protection type	Accuracy fe $\mu$ m	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
$\pm 0.25$	0.01	57	IP 52	8	1.4	511501 0100	78,-	073009 D001	16,-
$\pm 0.5$	0.01	57	IP 52	10	1.4	511501 1200	68,-	073009 D001	16,-

5102

### Scale division 0.001 mm

- Jewel bearing
- Spindle stroke 4.5 mm

Measurement range mm	Division mm	External ring $\varnothing$ mm	Protection type	Accuracy fe $\mu$ m	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
$\pm 0.04$	0.001	57	IP 64	3	2.0	511020 0001	167,-	073009 D001	16,-
$\pm 0.04$	0.001	57	No protection rating	3	1.4	511020 0002	157,-	073009 D001	16,-

5102

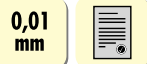


511501 1200

511020 0002

IP64

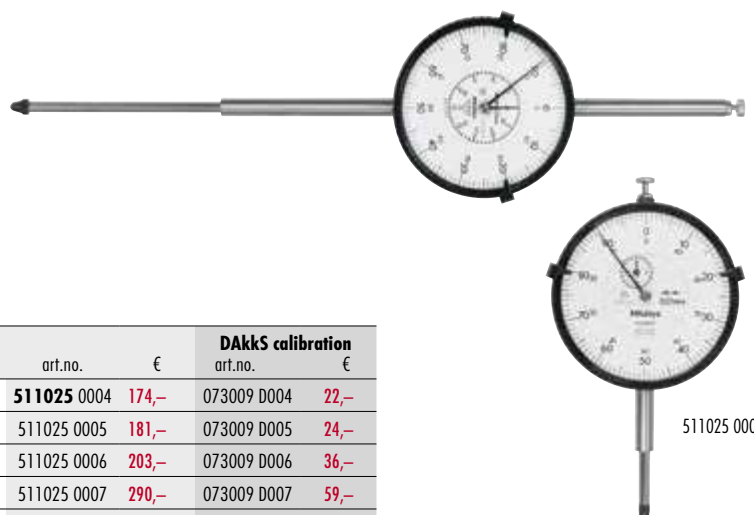
## Mitutoyo Dial indicator with large measurement range



- Jewel bearing
- Rotatable outer ring for zeroing
- Ring fixed by means of a clamping screw
- Two adjustable tolerance marks
- Probe tip thread: M2.5
- Clamping shank  $\varnothing$  8 mm
- **Shock proofing** (511025 0004 damped end point)
- Supplied in moulded packaging

Measurement range mm	Division mm	External ring $\varnothing$ mm	Accuracy fe $\mu$ m	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
20	0.01	78	25	2.0	511025 0004	174,-	073009 D004	22,-
30	0.01	78	30	2.5	511025 0005	181,-	073009 D005	24,-
50	0.01	78	50	3.0	511025 0006	203,-	073009 D006	36,-
80	0.01	78	50	3.0	511025 0007	290,-	073009 D007	59,-
100	0.01	78	60	3.2	511025 0008	435,-	073009 D007	59,-

5102



511025 0004

## ATORN® Indicating callipers

**DIN  
879-1**

- Compact design
- Measuring bolts hardened and precision-guided
- Measuring mechanism with ruby bearing, shock-proof
- With adjustment button for fine adjustment across the entire measurement range
- Protective sleeve to prevent accidental fine adjustment changes
- Red adjustable tolerance marks
- Contact point thread M2.5
- Clamping shank Ø 8 mm
- Supplied in moulded packaging

Measurement range mm	Division mm	Free lift mm	Measuring force N	Protection type	art.no.	€	DAkkS calibration art.no.	€
± 0.05	0.001	3.0	1	No protection rating	513107 0001	185,50	071240 D001	19,-
± 0.05	0.001	3.0	1	IP 53	513107 0010	188,50	071240 D001	19,-

5192



## SARA® Digital dial indicator

**Werks-  
norm**
**0,01  
mm**
**inch  
mm**


- Extremely easy to read with large LCD display
- Outer ring Ø 58 mm
- Clamping shank Ø 8 mm
- Probe tip thread M2.5
- **Functions:** mm/inch, ON/OFF, ZERO
- Supplied with CR 2032 battery, No. 548079 6032

Measurement range mm/inch	Reading mm/inch	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
12,57/5	0,01/0.0005	0.03	512015 1201	101,50	073009 D004	22,-

5121



## HELIOS · PREISSER Digital dial indicator wireless

**Werks-  
norm**
**inch  
mm**
**USB**
**RS232C**
**Digi-  
matic**


- Excellent legibility thanks to 11 mm-high digits
- Aluminium housing
- 280° rotating display field
- clamping shank Ø 8mm
- Outer ring Ø 60mm
- compatible with the radio system **ATORN-Integrated-Wireless**
- Data output via cable such as RS232, USB or Digimatic
- **Functions:** On/Off, mm/inch, TOL (tolerance value input), PRESET (user-defined values), factor input, key lock, integrated radio transmitter
- Supplied with battery CR 2450 # 548079 6450

Measurement range mm/inch	Reading mm/inch	Error limit mm	Measuring force N	art.no.	€	DAkkS calibration art.no.	€
12.5 / 0.5	0.0005 / 0.00002	0.004	0.65-0.9	512045 1201	399,-	073009 D004	22,-

5186

**integrated radio**

**NEW**

## ATORN® Digital dial indicator KEEPTRONIC



- **KEEPTRONIC** electronics store the zero point, operating keys lock to prevent accidental alteration of the zero point. Battery life approx. 3 years
- Data output **multiCOM** Can be used as USB, Digimatic or RS-232
- High-contrast LCD display with 12 mm high digits
- Casing Ø: 60 mm
- Clamping shank Ø 8 mm
- Contact point thread M2.5
- **Functions:** On/off/zeroing, toggle mm/inch and reverse measuring direction, pre-set user-defined values in the display
- Supplied with CR2032 battery, no. 548079 6032
- Optional accessories: Data cables, type P-RS 232 C / P-Digimatic / P-USB, no. 512521....

Data output multiCOM



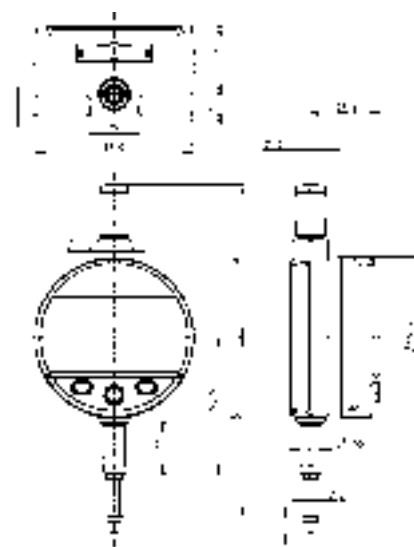
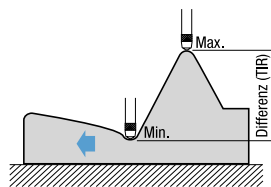
Measurement range mm/inch	Reading mm/inch	Error limit mm	Measuring force N	art.no.	€	DAkkS calibration art.no.	€
12.7 / 0.5	0,01 / .0005	20	0.5 - 1	512042 1210	160,-	073009 D004	22,-
12.7 / 0.5	0,001 / .00005	5	0.5 - 1	512042 1201	318,-	073009 D004	22,-

5181

## ATORN® Digital dial indicator for run-out measurements



- Inductive measuring system
- Aluminium casing with plastic front plate, Ø 60 mm, coolant-proof
- Easily readable LCD display with 11 mm high digits
- Front plate can be rotated through 270°
- Energy save mode and automatic reactivation
- Coloured LEDs for tolerance evaluation
- Max. / min. / max-min for run-out measurements
- 0.001 mm version, can be switched to 0.01 mm
- PROXIMITY data output
- Clamping shank Ø 8 mm
- Contact point thread M2.5
- **Functions:**
  - mm/inch toggle option
  - Preset (user-defined values)
  - Reverse counting direction
  - Switch between ref. 1 and ref. 2 (ABS/INC)
  - Hold
- Supplied with CR2032 battery, no. 548079 6032
- **Optional accessories:** Data cable: PROXIMITY-USB, no. 500700 9966 or PROXIMITY-RS, no. 500700 9965



Measurement range mm	Reading mm	Error limit mm	A mm	B mm	Measuring force N	art.no.	€	DAkkS calibration art.no.	€
12.5	0.01	10	66	54	0.65 - 0.9	512064 0125	390,-	073009 D004	22,-
25	0.01	10	82.5	64	0.65 - 1.15	512064 0025	430,-	073009 D004	22,-
50	0.01	20	142.5	121	1.4 - 2.9	512064 0050	939,-	073009 D006	36,-
100	0.01	20	244.5	172	1.8 - 3.8	512064 0100	1.109,-	073009 D007	59,-
12.5	0.001	3	66	54	0.65 - 0.9	512063 0125	460,-	073009 D004	22,-
25	0.001	4	82.5	64	0.65 - 1.15	512063 0025	579,-	073009 D004	22,-
50	0.001	5	142.5	121	1.4 - 2.9	512063 0050	1.069,-	073009 D006	36,-
100	0.001	6	244.5	172	1.8 - 3.8	512063 0100	1.219,-	073009 D007	59,-

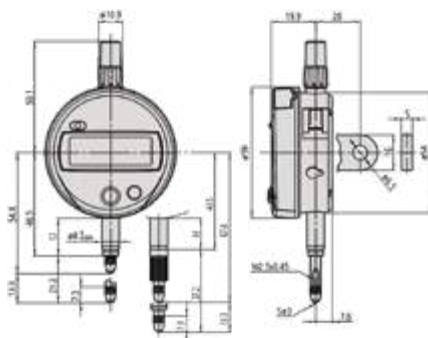
5181



## Mitutoyo Digital ABSOLUTE dial indicator IDS

Werks-norm
ABSOLUTE
Digi-matic
USB

- Effortless to read thanks to large 9 mm LCD digits
- Die-cast aluminium casing
- **ABSOLUTE** scale
- Carbide contact point with M2.5 thread
- Clamping shank  $\varnothing$  8 mm
- Unrestricted travel speed
- **Functions:** On/off, zeroing (ORIGIN), reverse measuring direction (+/-)
- **Optional accessories:** Digimatic cable type F, no. 563100 0051 (1 m), no. 563100 0052 (2 m); USB cable type F-USB, no. 563110 0006



ABSOLUTE®

### Standard version

- Battery life: 20,000 hrs.
- Supplied in moulded packaging with SR44 battery, no. 500534 0001

Measurement range mm	Reading mm	Error limit mm	External ring $\varnothing$ mm	Measuring force N	art.no.	€	DAkkS calibration art.no.	€
12.7	0.01	0.02	59	1.5	512029 1201	153,-	073009 D004	22,-
12.7	0.001	0.003	59	1.5	512029 1210	313,-	073009 D004	22,-

5102

### Solar

- First ABSOLUTE dial indicator with solar technology
- New modern solar cell allows operation from a light intensity of 40 Lux
- When the light level is over 40 Lux, the capacitor builds up a voltage reserve (120 min. charge = 240 min. voltage reserve)
- The set zero point or setting gauge is retained even during long periods of darkness
- Supplied in moulded packaging

Measurement range mm	Reading mm	Error limit mm	External ring $\varnothing$ mm	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
12,7	0.01	0.020	59	1.5	512028 1201	156,-	073009 D004	22,-
12.7	0.001	0.003	59	1.5	512028 1210	317,-	073009 D004	22,-

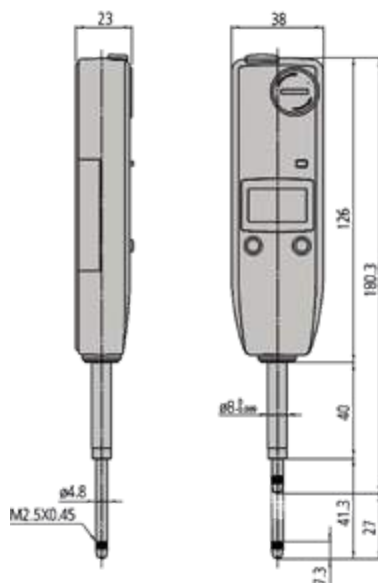
5102



## Mitutoyo Digital ABSOLUTE dial indicator IDU

Werks-norm
0,01 mm
ABSOLUTE
Digi-matic
USB

- **ABSOLUTE** scale
- Casing size: 38 x 126 x 23 mm
- Clamping shank  $\varnothing$  8 mm
- Contact point: Carbide with M2.5 thread
- Battery life approx. 20,000 hours
- **Functions:** On/off, zero point (ORIGIN), reverse counting direction (+/-)
- Supplied in moulded packaging with SR44 battery (no. 500534 0001) and lifting lever
- **Optional accessories:** Digimatic cable type F, no. 563100 0051 (1 m), no. 563100 0052 (2 m); USB cable type F-USB, no. 563110 0006



ABSOLUTE®

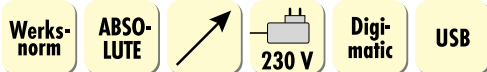


Measurement range mm	Reading mm	Error limit mm	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
25	0.01	0.020	1.8	512030 0101	214,-	073009 D004	22,-

5102



## Mitutoyo Digital ABSOLUTE dial indicator IDF



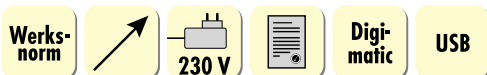
- Power supply via mains adapter
- **ABSOLUTE scale**
- Backlit LCD display
- Combined digital and analogue display, which switches colour from green to red if the pre-set tolerance limits are exceeded
- Clamping shank  $\varnothing$  8 mm
- Unrestricted travel speed
- Max., min. or difference values (TIR) can be selected for run-out measurements
- **Functions:** (ON/OFF) for power on/off; (MODE) for switching between: normal measurement, tolerance input, max. hold value, min. hold value, run-out measurement (max-min difference); (RANGE/Adj) for switching the analogue display range, centring the zero point of the analogue display pointer; (PRESET/SET) for determining the absolute starting point, pre-setting user-defined values, inputting tolerance values, confirming mode selection; (ZERO/ABS) for user-defined zeroing, switching between absolute/comparative measurement systems; (RES) for switching between 0.001 mm and 0.01 mm; (+/-) sign selection, function lock
- Supplied in moulded packaging, with mains adapter and lifting lever
- **Optional accessories:** Digimatic cable type D, no. 563100 0031 (1 m), no. 563100 0032 (2 m), USB cable type D-USB, no. 563110 0004



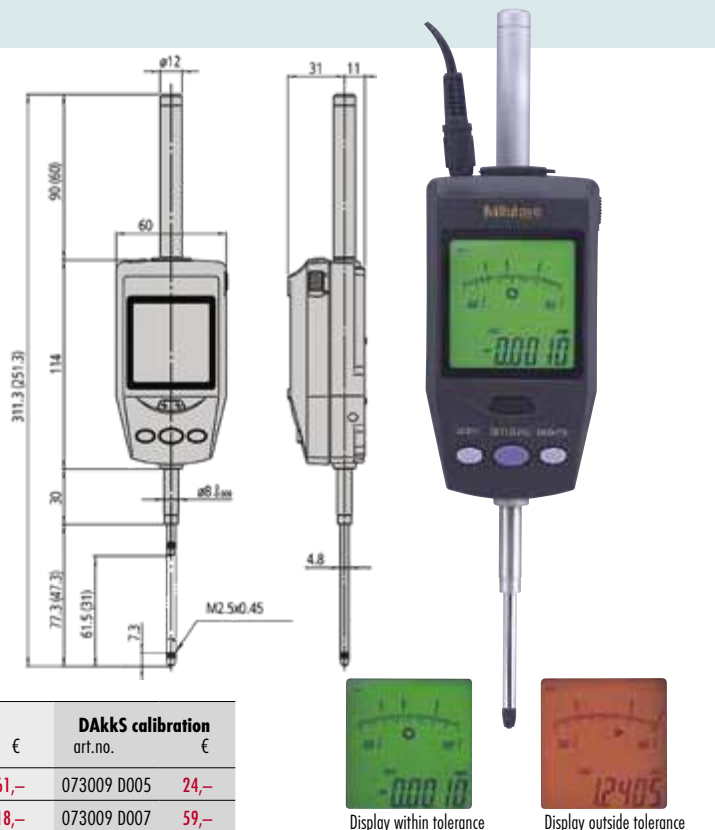
Measurement range mm	Reading mm	Error limit mm	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
25	0.01 / 0.001	0.003	1.8	512022 0025	635,-	073009 D004	22,-
50	0.01 / 0.001	0.006	2.3	512022 0050	690,-	073009 D006	36,-
50	0.01 / 0.001	0.003	2.3	512022 0051	851,-	073009 D006	36,-

5102

## Mitutoyo Digital dial indicator IDH



- **Can be remote controlled**
- **Power supply via mains adapter**
- Photoelectric backlit glass scale
- Max. travel speed 1,000 mm/sec.
- Backlit LCD display
- Combined digital and analogue display
- Max., min. or difference values (TIR) can be selected for run-out measurements
- Optional remote control available
- Combined Digimatic / RS-232 C interface data output, can be used in both directions
- Clamping shank  $\varnothing$  8 mm
- **Functions:** ON/OFF, MODE for switching from normal mode to tolerance evaluation, resolution for digital and analogue display, setup menu, MAX, MIN and TIR, toggle between 0.001 mm and 0.01 mm, (+/-) sign selection, SET/ZERO for confirming inputs and the display zero point, DATA/fn for data transfer and keypad lock
- Supplied in moulded packaging with mains adapter and factory certificate
- **Optional accessories:** Digimatic cable type D, no. 563100 0031 (1 m), no. 563100 0032 (2 m), USB cable type D-USB, no. 563110 0004



### Dial indicator

Measurement range mm	Reading mm	Error limit mm	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
30	0.001 / 0.0005	0.002	2.0	512035 0030	661,-	073009 D005	24,-
60	0.001 / 0.0005	0.003	2.5	512035 0060	718,-	073009 D007	59,-

5102

### Accessories

Designation	art.no.	€
Remote control	512036 0003	84,-
Signal cable, RS-232 C, 1 m	512036 0001	186,-
Signal cable, RS-232 C, 2 m	512036 0002	210,-

5102



512036 0003

## Mitutoyo Digital ABSOLUTE dial indicators IDN / IDB



ABSOLUTE®



Sicherheit  
Staub- und  
wasserge-  
schützt

www.tuv.com  
ID 000007162

• Small and slim digital dial indicators for installation in fixtures with limited space

**ABSOLUTE scale**

- Battery life approx. 7,000 hours
- Unrestricted travel speed
- Easy to read thanks to large display
- Type B readings from above, Type N readings from the front

**IP66 protection rating**, oil-resistant casing

• Small casing dimensions, w = 35 mm / h = 60 mm

**Display can be flipped 180° depending on installation position**

• Dial indicators with 0.001 mm resolution, can be switched to 0.01 mm

• Can be controlled remotely via special cable (optional accessory)

• **Functions:** On/off/DATA for transmitting measurement values, SET for confirming inputs, MODE for selecting tolerances, zeroing, counting direction, display switching

• Supplied in moulded packaging with SR44 battery, no. 500534 0001

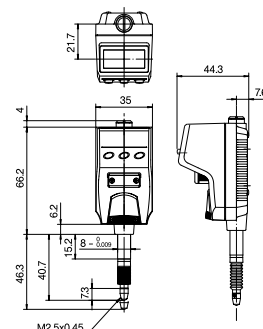
• **Optional accessories:** Digimatic cable type G, no. 563100 0061 (1 m), no. 563100 0062 (2 m); USB cable type G-USB, no. 563110 0007



Display can be rotated through 180°



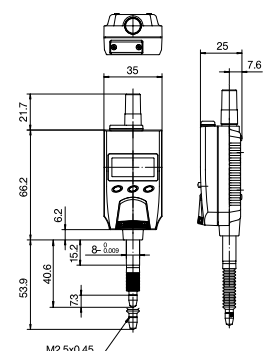
Type B



**Slim design! Perfect for use in fixtures**



Type N



Measurement range mm	Reading mm	Type	Error limit mm	Measuring force max. N	art.no.	€	DAkkS calibration art.no.	€
5.0	0.01	IDB	0.03	2.0	512031 0005	267,-	073009 D002	18,-
5.0	0.001/0.01	IDB	0.004/0.02	2.0	512031 0105	357,-	073009 D002	18,-
12.7	0.01	IDN	0.03	2.5	512031 0012	239,-	073009 D004	22,-
12.7	0.001/0.01	IDN	0.004/0.02	2.5	512031 0112	328,-	073009 D004	22,-

5102

**Accessories**

Designation	for type	art.no.	€
Cover plate with lug	IDB / IDN	512032 0003	19,-
Control cable, 1 m (external zero / PRESET)	IDB / IDN	512032 0001	164,-
Control cable, 2 m (external zero / PRESET)	IDB / IDN	512032 0002	186,-

5102



## Mitutoyo IDC digital ABSOLUTE dial indicator with calculation function



**ABSOLUTE scale**

- Suitable for use with chamfer gauges or measuring bridges for determining diameters
- Freely programmable calculation formula  $Ax + B + Cx - I$
- Combined digital/analogue display
- Resolution can be selected in 12 steps, 0.0002 mm to 1 mm
- Display part can be rotated through 330° for better reading
- 3 memory slots for pre-set and tolerance values
- Configurable via PC (special interface optional)
- Clamping shank  $\varnothing$  8 mm
- Probe tip thread M2.5

• **Functions:** Zeroing (ORIGIN), input tolerance values (TOL), input user-defined values (PRESET), confirm set formula, data transfer (DATA), hold value (HOLD), input calculation function (MODE), on/off

• Supplied in moulded packaging with battery CR 2032 No. 548079 6032

• **Special accessories:** Digimatic cable type F, No. 563100 0051 (1 m), No. 563100 0052 (2 m), USB cable type F-USB, no. 563110 0006



Suitable for 512019

ABSOLUTE®



Measurement range mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
12.7	0.003	512017 1201	552,-	073009 D004	22,-

5102

## Mitutoyo Dial indicator accessories

### Coloured tolerance markings

- Transparent
- For dial indicators with outer ring Ø 57 mm (size 55.6 mm)
- Pack of 10

Designation	Colour	art.no.	€
Red tolerance marking	Red	517010 0001	13,-
Green tolerance marking	Green	517010 0002	13,-

5102



517010 0002



517010 0001

### Cover plate

- With magnet
- Suitable for analogue dial indicators (no. 511010... / 511015...) and IDC / IDF digital dial indicators

Designation	art.no.	€
Cover plate with magnet	517015 0020	49,-

5102



517015 0020

### Lifting knob

suitable for	art.no.	€
Digital dial indicators with measurement range 12.7 mm	512037 0004	31,-
IDC dial indicators with measurement range 25.4 mm	512037 0001	64,-
IDC dial indicators with measurement range 50.8 mm	512037 0003	76,-

5102



### Lifting lever and wire release

- Lifting levers and wire releases are screwed onto or into the respective dial indicator and are used to lift the measuring bolt when changing workpieces
- Wire releases have approx. 12 mm of travel (for IDS, IDC, IDF, IDU), 30 mm for IDH dial indicators

Designation	suitable for dial indicator	art.no.	€
Lifting lever for operating the plunger	Analogue, 511010... (10 mm), 511015...	512025 0149	8,-
Lifting lever for operating the plunger	Analogue, 511001..., 511002...	512025 0206	12,-
Lifting lever for operating the plunger	IDS, IDC (12.7 mm)	512025 0101	11,-
Lifting lever for operating the plunger	IDF, IDH, IDU	512020 0300	3,-
Wire remover	IDS, IDC, IDF, IDH, IDU	512505 0001	30,-

5102



512025 0101



512020 0300



512505 0001

## Measuring bridge

- For depth measurements
- Made from hardened and lapped tool steel
- **Holding fixture for dial indicators with shank diameter 8 mm**
- Matt chrome-plated
- Supplied in a wooden case with recess for Ø 58 mm dial indicator

Base size mm	art.no.	€	Factory calibration	
			art.no.	€
101 x 17	504902 0002	79,90	073103 W143	14,-
63 x 17	504902 0001	73,30	073103 W143	14,-

5121



504902 0001

504902 0002



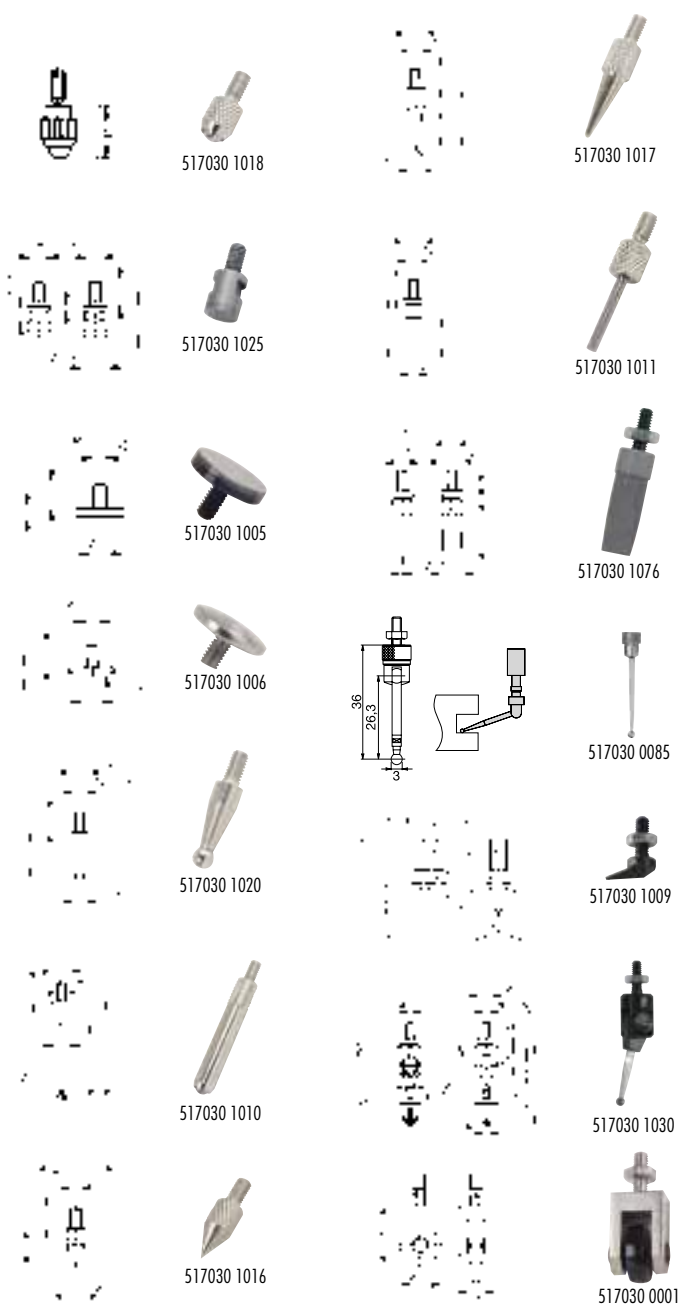
## Mitutoyo Accessories for dial indicators and indicating callipers

- Contact points in alternative designs or with ruby/sapphire tips available on request
- Connection thread M2.5 x 0.45 mm

### Special-purpose contact points

Probe point design	Material probe point	Ø mm	L mm	art.no.	€
Ball (standard measurement end)	Steel	3	-	<b>517030 1018</b>	<b>1,-</b>
Ball (standard measurement end)	Carbide	3	-	517030 1029	<b>4,88</b>
Ball (standard measurement end)	Ruby	3	-	517030 1060	<b>9,10</b>
Flat	Steel	4.8	-	517030 1002	<b>4,40</b>
Flat	Carbide	4.8	-	517030 1025	<b>28,50</b>
Flat	Steel	10	-	517030 1005	<b>4,94</b>
Flat	Steel	20	-	517030 1007	<b>19,55</b>
Flat	Steel	30	-	517030 1012	<b>19,55</b>
Flat	Carbide	10	-	517030 1027	<b>49,40</b>
Spherical	Steel	10	-	517030 1006	<b>6,35</b>
Ball	Steel	1	-	517030 1051	<b>7,60</b>
Ball	Steel	2	-	517030 1052	<b>7,60</b>
Ball	Steel	3	-	517030 1020	<b>7,60</b>
Ball	Steel	4	-	517030 1054	<b>7,60</b>
Ball	Steel	5	-	517030 1055	<b>7,60</b>
Ball	Steel	6	-	517030 1056	<b>7,60</b>
Ball	Carbide	1	-	517030 1081	<b>23,80</b>
Ball	Carbide	2	-	517030 1082	<b>23,80</b>
Ball	Carbide	3	-	517030 1080	<b>23,80</b>
Ball	Carbide	4	-	517030 1084	<b>23,80</b>
Ball	Carbide	5	-	517030 1085	<b>23,80</b>
Ball	Carbide	6	-	517030 1086	<b>23,80</b>
Ball	Steel	3	26	517030 1010	<b>3,72</b>
Ball	Carbide	3	26	517030 1040	<b>12,80</b>
Tapered	Steel	-	-	517030 1016	<b>5,95</b>
Pointed tip	Steel	-	-	517030 1017	<b>5,65</b>
Cylindrical	Steel	-	40	517030 1008	<b>10,90</b>
Cylindrical	Steel	-	11	517030 1011	<b>7,95</b>
Cylindrical	Carbide	-	11	517030 1070	<b>29,20</b>
Blade	Carbide	-	-	517030 1076	<b>63,60</b>
Roller	Steel	-	-	517030 0001	<b>59,-</b>
Offset	Steel	-	-	517030 1009	<b>47,60</b>
Swivel-mounted	Steel	-	26	517030 1030	<b>70,40</b>
Swivel-mounted	Steel	-	36	517030 0085	<b>27,-</b>

5102



### Replaceable extensions

- Connection thread M2.5 x 0.45 mm
- Probe bolt diameter 5 mm

L mm	art.no.	€
10	<b>517035 0010</b>	<b>4,-</b>
15	517035 0015	<b>8,15</b>
20	517035 0020	<b>8,15</b>
30	517035 0030	<b>9,20</b>
40	517035 0040	<b>11,20</b>
50	517035 0050	<b>12,25</b>

5102

L mm	art.no.	€
60	517035 0060	<b>16,30</b>
70	517035 0070	<b>18,35</b>
80	517035 0080	<b>19,35</b>
90	517035 0090	<b>21,40</b>
100	517035 0100	<b>21,40</b>

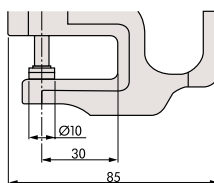
5102



## Mitutoyo Quick-acting thickness gauge

0,01  
mm

- With analogue dial indicator
- Easy zero point adjustment
- Ceramic measuring faces



Planarity: 5 µm

Measurement range mm	Reading mm	Error limit mm	Projection mm	art.no.	€	DAkkS calibration art.no.	€
0-10	0.01	0.020	30	520101 0005	124,-	071220 D001	62,-

5102



520101 0005

## Kroeplin Analogue fast display callipers IP65



- 1 fixed and 1 moving probe arm
- Measurement result can be read directly and easily from the clearly laid out dial indicator
- with tolerance markers

### External fast display callipers

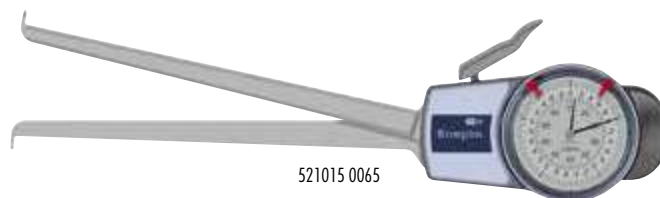
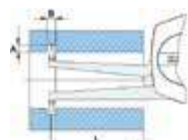
- For quickly measuring walls, metal sheets, foils etc.

Measurement range mm	Measuring depth mm	Measuring probe length mm	Error limit mm	Reading mm	Measuring probe mm	art.no.	€	DAkkS calibration art.no.	€
0-20	85	24.6	0.03	0.01	Carbide ball 1.5	520051 0004	390,-	072007 D001	22,-
0-50	167	30	0.05	0.05	Carbide ball, 3.0	521014 0030	436,40	072007 D001	22,-

5123



520051 0004



521015 0065

### Internal fast display calliper

- For quickly measuring internal grooves, recesses and bores

Measurement range mm	Measuring depth mm	Groove depth A max. mm	Groove width B min. mm	Error limit mm	Reading mm	Measuring probe mm	art.no.	€	DAkkS calibration art.no.	€
2.5-12.5	12	0.7	0.4	0.015	0.005	Cutting edge R0.1	520065 0001	390,-	072006 D001	22,-
5-15	35	2.3	0.8	0.015	0.005	Carbide ball 0.6	520065 0002	390,-	072006 D001	22,-
10-30	85	5.2	1.2	0.03	0.01	Carbide ball, 1.0	520065 0003	390,-	072006 D001	22,-
20-40	85	7.0	1.2	0.03	0.01	Carbide ball, 1.0	520065 0004	390,-	072006 D001	22,-
30-50	85	7.0	1.2	0.03	0.01	Carbide ball, 1.0	520065 0005	390,-	072006 D001	22,-
40-60	85	8.3	1.2	0.03	0.01	Carbide ball, 1.0	520065 0006	390,-	072006 D001	22,-
50-70	85	8.3	1.2	0.03	0.01	Carbide ball, 1.0	520065 0007	390,-	072006 D001	22,-
60-80	85	8.3	1.2	0.03	0.01	Carbide ball, 1.0	520065 0008	390,-	072006 D001	22,-
70-90	85	8.3	1.2	0.03	0.01	Carbide ball, 1.0	520065 0009	390,-	072006 D001	22,-
80-100	85	8.3	1.2	0.03	0.01	Carbide ball, 1.0	520065 0010	390,-	072006 D001	22,-
15-65	188	5.5	2.0	0.05	0.05	Carbide ball 1.5	521015 0065	445,-	072006 D001	22,-
40-90	192	8.3	2.5	0.05	0.05	Carbide ball, 2.0	521015 0090	445,-	072006 D001	22,-
70-120	192	8.3	2.5	0.05	0.05	Carbide ball, 2.0	521015 0120	519,-	072006 D002	26,-

5123

## Kroepelin Digital fast display callipers IP67 with digital display



- Handy fast display callipers for internal and external measurements
- Adjustable increments: 0.001 / 0.002 / 0.005 / 0.01 / 0.02 / 0.05 mm
- Enhanced analogue/digital display with a display area of 250°
- Optional Bluetooth interface (up to 8 devices at once)
- Optional USB and DIGIMATIC interface
- Memory can store up to 100 measurement values
- **Functions:** Control lever, measurement program selection, start menu and functions, data transfer, ON/OFF, O-PRESET
- Supplied with 2x AAA batteries, no. 548079 4003
- **Special accessories:** Digi-matic interface adapter no. 524002 0005 plus Digi-matic cable Type E, no. 563100 0041 (1 m), no. 563100 0042 (2 m), USB cable Type E-USB no. 563110 0005, Bluetooth interface adapter no. 524002 0015



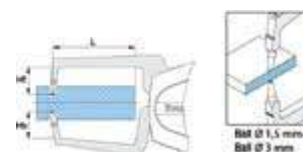
### External fast display calliper

- For quickly measuring walls, metal sheets, foils etc.

NEW

Measurement range mm	Measuring probe Hf/Hb length mm	Measuring depth mm	Reading mm	Error limit mm	Measuring probe mm	art.no.	€	DAkkS calibration art.no.	€
0-10	19.1/18.6	35	0.005	0.015	Carbide ball 1.5	521019 0013	399,-	072007 D001	22,-
0-20	24.6	85	0.01	0.015	Carbide ball 1.5	521019 0012	399,-	072007 D001	22,-
0-30	30	115	0.01	0.04	Carbide ball 3.0	521014 0031	399,-	072007 D001	22,-
0-50	30	167	0.01	0.05	Carbide ball 3.0	521014 0040	549,-	072007 D001	22,-

5123



### Internal fast display calliper

- For quickly measuring internal grooves, recesses and bores

Measurement range mm	Measuring depth mm	Groove depth A max. mm	Groove width B min. mm	Reading mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
2.5-12.5	12	0.7	0.4	0.005	0.015	521012 0020	399,-	072006 D001	22,-
5-15	35	2.3	0.8	0.005	0.015	521012 0021	399,-	072006 D001	22,-
10-30	85	5.2	1.2	0.01	0.03	521012 0022	399,-	072006 D001	22,-
20-40	85	7.0	1.2	0.01	0.03	521012 0023	399,-	072006 D001	22,-
30-50	85	7.0	1.2	0.01	0.03	521012 0024	399,-	072006 D001	22,-
40-60	85	8.3	1.2	0.01	0.03	521012 0025	399,-	072006 D001	22,-
50-70	85	8.3	1.2	0.01	0.03	521012 0026	399,-	072006 D001	22,-
60-80	85	8.3	1.2	0.01	0.03	521012 0027	399,-	072006 D001	22,-
70-90	85	8.3	1.2	0.01	0.03	521012 0028	399,-	072006 D001	22,-
80-100	85	8.3	1.2	0.01	0.03	521012 0029	399,-	072006 D001	22,-
13-43	127	5.5	1.8	0.01	0.04	521016 0143	399,-	072006 D001	22,-
30-60	132	6.5	2.0	0.01	0.04	521016 0160	399,-	072006 D001	22,-
15-65	188	5.5	2.0	0.01	0.05	521016 0165	549,-	072006 D001	22,-
50-80	132	8.5	2.3	0.01	0.04	521016 0180	399,-	072006 D001	22,-

5123



Over 200,000 tools available online!

#### Advantages:

- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

[www.saratools.com](http://www.saratools.com)

## Kroepelin Digital fast display callipers IP67



- Extra-small design, therefore very handy fast display calliper for indoor and outdoor measurements
- Adjustable increments: 0.001 / 0.002 / 0.005 / 0.01 mm
- Enhanced analogue display with a display area of 250°
- Li-ion battery with inductive charging, no battery replacement required
- Optional Bluetooth interface (up to 8 devices at once)
- Optional USB and Digmatic interface
- Memory can store up to 100 measurement values
- **Functions:** Control lever, measurement program selection, start menu and functions, data transfer, ON/OFF, 0-PRESET
- Supplied with charging cradle and Bluetooth dongle (Bluetooth interface adapter optional)
- **Special accessories:** Digmatic interface adapter No. 5240020006 plus Digmatic cable type E, No. 563100 0041 (1 m), No. 563100 0042 (2 m); USB cable type E-USB, No. 5631100005



### External fast display calliper

Measurement range mm	Measuring probe Hf/Hb length mm	Measuring depth mm	Reading mm	Error limit mm	Measuring probe mm	art.no.	€	DAkkS calibration art.no.	€
0-15	17	45	0.001	0.010	Carbide ball 1.5 mm	521018 0001	445,-	072007 D001	22,-
0-15	12	45	0.001	0.015	Cutting edge R0.4 mm	521018 0002	445,-	072007 D001	22,-

5123

### Internal fast display calliper

Measurement range mm	Measuring depth mm	Groove depth A max. mm	Groove width B min. mm	Error limit mm	Reading mm	Measuring probe mm	art.no.	€	DAkkS calibration art.no.	€
2.5-12.5	12	0.7	0.6	0.01	0.001	Cutting edge R0.12	521018 0101	445,-	072006 D001	22,-
5-20	44	2.2	0.8	0.01	0.001	Carbide ball 0.6	521018 0102	445,-	072006 D001	22,-
10-25	46	4.0	1.5	0.01	0.001	Carbide ball, 1.0	521018 0103	445,-	072006 D001	22,-

5123

Description	art.no.	€
Interface adapter for Mitutoyo applications	524002 0006	94,40

5123

Designation	suitable for	art.no.	€
Interface adapter for Bluetooth applications	521012.... / 521017.... / 521019....	524002 0010	94,40

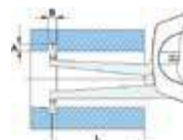
5123



## Kroepelin Digital internal fast display calliper with 3-point contact IP67



- 3-point contact improves centring for a faster process, reliable measurement and accurate results
- Adjustable increments: 0.001 / 0.002 / 0.005 / 0.01 / 0.02 / 0.05 mm
- Enhanced analogue/digital display with a display area of 250°
- Optional Bluetooth interface (up to 8 devices at once)
- Optional USB and DIGIMATIC interface
- Memory can store up to 100 measurement values
- **Functions:** Control lever, measurement program selection, start menu and functions, data transfer, ON/OFF, 0-PRESET
- Supplied with 2x AAA batteries, no. 548079 4003
- **Special accessories:** Digmatic interface adapter no. 524002 0005 plus Digmatic cable Type E, no. 563100 0041 (1 m), no. 563100 0042 (2 m), USB cable Type E-USB no. 563110 0005, Bluetooth interface adapter no. 524002 0015



Measurement range mm	Measuring depth mm	Groove depth A max. mm	Groove width mm	Error limit mm	Reading mm	Measuring probe mm	art.no.	€	DAkkS calibration art.no.	€
7-14	34	2.2	0.8	0.01	0.002	Carbide ball 0.6	521017 1014	480,-	072006 D001	22,-
10-20	75	3.5	1.6	0.02	0.005	Carbide ball, 1.0	521017 1020	480,-	072006 D001	22,-
15-30	77	5.0	1.5	0.02	0.005	Carbide ball, 1.0	521017 1030	480,-	072006 D001	22,-
25-45	85	7.0	1.6	0.02	0.005	Carbide ball, 1.0	521017 1045	480,-	072006 D001	22,-
40-60	84	8.0	1.6	0.02	0.005	Carbide ball, 1.0	521017 1060	480,-	072006 D001	22,-
55-75	84	8.0	1.6	0.02	0.005	Carbide ball, 1.0	521017 1075	480,-	072006 D001	22,-
70-90	84	8.5	1.6	0.02	0.005	Carbide ball, 1.0	521017 1090	480,-	072006 D001	22,-
85-105	84	9.0	1.6	0.02	0.005	Carbide ball, 1.0	521017 1105	480,-	072006 D002	26,-

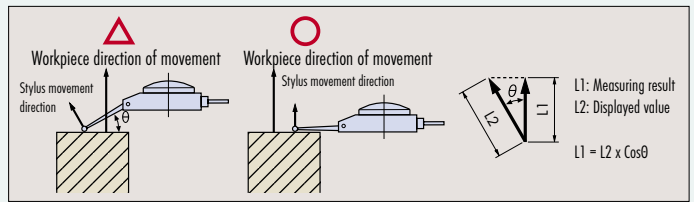
5123

## Lever dial indicators

INFO

### Angle error

- Always minimise the angle between movement directions of the workpiece.
- The dial test indicator display value will differ from the true value if the workpiece and the direction of movement deviate by any angle. The measuring probe can be aligned through the pivot point of the measuring device such that the angle is minimised.  $\theta$  If necessary, the display and thus the measured value can be corrected to the actual value of the angle  $\theta$  by using the following table.
- Result of measurement = displayed value x correction factor



### Correction for a non-zero angle

Angle	Correction value
10°	0.98
20°	0.94
30°	0.86
40°	0.76
50°	0.64
60°	0.50

#### Examples

If the dial test indicator at various values of the angle shows = 0.200 mm, the measurement results are as follows:

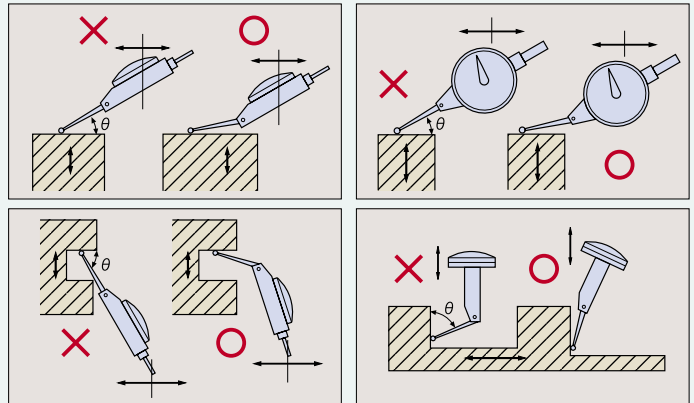
For = 10°, 0.200mm x 0.98 = 0.196mm

For = 20°, 0.200 mm x 0.94 = 0.188 mm

For = 30°, 0.200mm x 0.86 = 0.172mm

#### Note:

A special contact point of involute form can be used for automatic correction; this allows measurements without manual correction for any angle between 0° and 30°.



## SARA® Dial test indicator

DIN 2270



- Ideal for measuring deviations in shape and position, true running and axial run-out as well as alignment work
- Matt chrome-plated metal casing
- Casing and dovetail mounting V-blocks made in one piece for exceptionally rigid clamping
- Supplied with Ø 6 and 8 mm clamping shank

Measurement range mm	Reading mm	Scale	Accuracy fe µm	External ring Ø mm	Sensor tip length mm	art.no.	€	DAkkS calibration art.no.	€
0.8	0.01	0-40-0	10	29	14.3	525031 0029	66,20	071250 D001	18,-
0.8	0.01	0-40-0	10	40	14.3	525031 0040	68,20	071250 D001	18,-

5121



## ATORN® Dial test indicator

DIN 2270



- Dovetail attachment
- **Size 0040 with dial face seal and waterproof scale casing**
- **Size 0058 extremely easy to read thanks to 58 mm scale diameter**
- Supplied with Ø 8 mm clamping shank

Measurement range mm	Reading mm	Scale	Accuracy fe µm	External ring Ø mm	Sensor tip length mm	art.no.	€	DAkkS calibration art.no.	€
1.0	0.01	0-50-0	10	32	16.6	525051 1032	94,60	071250 D001	18,-
1.0	0.01	0-50-0	10	40	16.6	525051 1040	106,-	071250 D001	18,-
0.5	0.01	0-25-0	10	32	35.7	525051 0532	128,50	071250 D001	18,-
0.5	0.01	0-25-0	10	40	35.7	525051 0540	142,50	071250 D001	18,-
0.2	0.002	0-100-0	3	32	12.8	525051 0232	110,-	071250 D001	18,-
0.2	0.002	0-100-0	3	40	12.8	525051 0240	124,50	071250 D001	18,-
0.2	0.001	0-100-0	3	40	12.8	525051 0040	142,50	071250 D001	18,-
0.2	0.001	0-100-0	3	58	12.8	525051 0058	163,-	071250 D001	18,-

5192



### Contact points for ATORN analogue dial test indicators

- Choice of carbide or ruby balls
- Ø 2 mm
- **Caution! Changing the standard contact point length will lead to incorrect measurements!**

L mm	Carbide metal	Ruby	art.no.	€
12.8	x	-	525018 0001	12,45
12.8	-	x	525018 0002	26,70
16.6	x	-	525018 0003	14,05

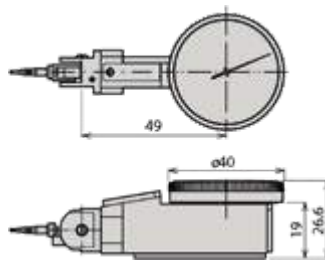
5192

L mm	Carbide metal	Ruby	art.no.	€
16.6	-	x	525018 0004	26,70
35.7	x	-	525018 0005	21,40
35.7	-	x	525018 0006	32,40

5192







**Universal version**

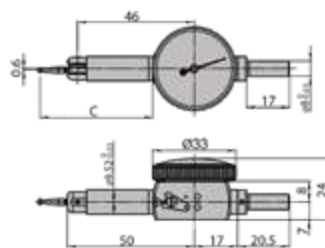
- Contact point holding fixture can be rotated through 360°

Measurement range mm	Reading mm	Scale	Accuracy fe µm	External ring Ø mm	Sensor tip length mm	art.no.	€	DAkkS calibration art.no.	€
0.8	0.01	0.40-0	8	36	24.1	525020 0009	406,-	071250 D001	18,-

5102



525020 0009



**Miniature version**

- With switching lever to change the measuring direction

Measurement range mm	Reading mm	Scale	Accuracy fe µm	External ring Ø mm	Sensor tip length mm	art.no.	€	DAkkS calibration art.no.	€
0.5	0.01	0.25-0	10	33	36.8	525501 0008	159,-	071250 D001	18,-

5102



525501 0008

**Contact points**

- Choice of carbide or ruby balls
- **Caution! Changing the standard contact point length will lead to incorrect measurements!**

L mm	Sensor ball Ø mm	Carbide metal		Ruby	
		art.no.	€	art.no.	€
11.2	2	525920 0147	17,-	525925 0147	27,-
15.2	2	525920 0152	17,-	525925 0152	21,-
17.4	2	525920 0209	17,-	525925 0209	27,-
18.7	2	525920 0223	17,-		
33.9	2	525920 0368	16,-		
41.0	2	525920 0445	14,-	525925 0445	27,-

5102

5102



Ruby



Carbide metal

**Accessories**

- **Universal holder with dovetail mount**, shank Ø 8 mm
- **Universal holder**
- **9 x 9 x 100 mm holding fixture** for attaching dial test indicators to height meters and marking-out instruments
- **Centring holder** for using a dial test indicator as an edge finder, or for aligning bores and shafts with the centre of the spindle

Description	art.no.	€
Universal holder with dovetail mount, shank Ø 8 mm	525050 0012	36,-
Universal holder	525050 0015	30,-
Mount 9 x 9 x 100 mm	525050 0025	21,-
Centring holder	525050 0021	128,-

5102



525050 0012



525050 0015



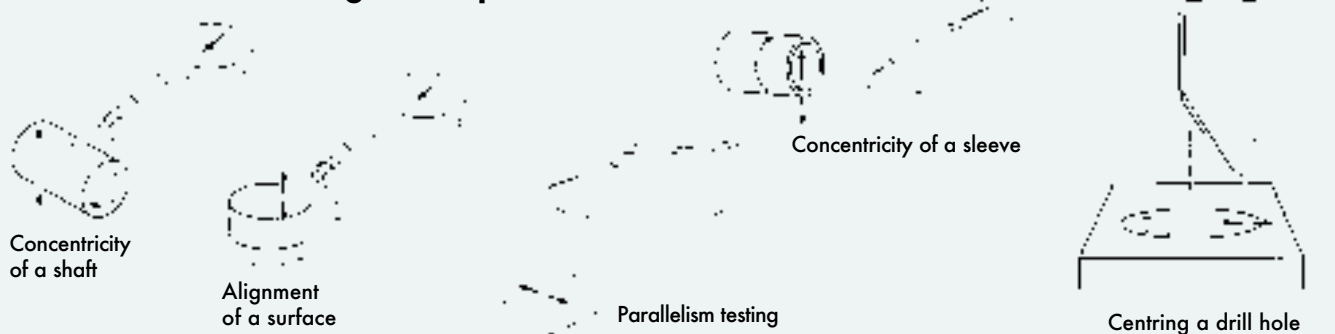
525050 0025



525050 0021

525050 0021 dovetail or Ø 4 mm mount

**Lever dial indicator usage examples**



Concentricity of a shaft

Alignment of a surface

Parallelism testing

Centring a drill hole



## SARA® Height gauge and marking-out instrument

### Werk-norm

- With large stand
- Matt-chromed scale
- Raised guide edges
- Slider with matt-chromed Vernier scale
- Scriber offset and carbide-tipped

Measurement range mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
300	0.04	530101 1310	112,-	071270 D001	32,-
500	0.06	530101 1510	182,50	071270 D002	40,-
5116					

### Accessories

Description	art.no.	€
Scriber for measurement range 300 mm	532010 0040	27,40
Scriber for measurement range 500 mm	532010 0050	30,50
5116		



530101 1310

## SARA® Height meter and marking-out instrument

### Werk-norm

- Sturdy design with large stand
- Matt chrome-plated, adjustable scale
- Raised guide edges
- Slider with matt chrome-plated Vernier scale
- Reading magnifier
- Fine adjustment and clamping mechanism
- Scriber offset and carbide-tipped
- Supplied in moulded packaging



Measurement range mm	Vernier mm	Error limit mm	Measuring column mm	art.no.	€	DAkkS calibration art.no.	€
0-300	0.02	0.06	28 x 9	530101 1300	157,-	071270 D001	32,-
5116							

### Accessories

Designation	art.no.	€
Spare scriber	532010 0030	27,40
5116		



## SARA® Digital height gauge and marking-out instrument

### Werk-norm

0,01  
mminch  
mm

- Sturdy design with large stand
- Easy to read thanks to high-contrast LCD
- Slider with fine adjustment and clamping mechanism
- Scriber offset and carbide-tipped
- **Functions:** ON/OFF, zero-setting, preset, hold, mm/inch
- Supplied with CR 2032 battery, No. 548079 6032

Measurement range mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
300	0.04	530500 0310	395,-	071270 D001	32,-
500	0.06	530500 0510	629,-	071270 D002	40,-
5116					

### Accessories

Designation	art.no.	€
Spare scriber	530010 0060	30,10
5116		



530500 0310

## ATORN® Digital height meter and marking-out instrument



- Gauging cylinder made from special stainless steel
- LCD display, digit height 11 mm
- Steel base with dirt groove
- Measurement possible from base surface
- Carbide-tipped scriber
- **Functions: On/automatic switch-off, user-defined zeroing, mm/inch toggle option**
- Supplied in moulded packaging

- With fine adjustment

Measurement range mm	Reading mm	Measuring column mm	art.no.	€	DAkkS calibration art.no.	€
300	0.01	30x12	530310 0300	649,-	071270 D001	32,-
600	0.01	30x12	530310 0600	939,-	071270 D002	40,-
1000	0.01	30x12	530310 1000	1.349,-	071270 D003	65,-

5197

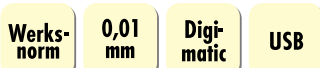
### Spare scribers

L mm	art.no.	€
75	530320 0075	141,50
150	530320 0100	156,-

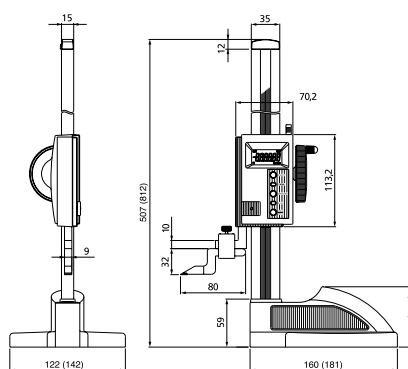
5197



## Mitutoyo Digital height meter and marking-out instrument



- Sturdy design with large stand
- LCD display with 10 mm high digits
- Hand wheel for movement, user-defined travel speed
- Locking mechanism
- Scriber offset and carbide-tipped
- **Functions: ON/OFF, ORIGIN initial value, ZERO/ABS, DATA/HOLD**
- Supplied with SR44 battery, no. 500534 0001
- **Optional accessories:** Digimatic cable type F, no. 563100 0051 (1 m), no. 563100 0052 (2 m), USB cable type F-USB, no. 563110 0006



Values in brackets for measurement range 600

ABSOLUTE®



Measurement range mm	Reading mm	Error limit mm	Measuring column mm	art.no.	€	DAkkS calibration art.no.	€
0-300	0.01	0.04	35 x 15	530502 0300	617,-	071270 D001	32,-
0-600	0.01	0.06	35 x 15	530502 0600	1.077,-	071270 D002	40,-

5102

## Mitutoyo Accessories for height meters and marking-out instruments

### Scribers

suitable for height meter and marking-out instrument	L mm	H mm	W mm	T mm	art.no.	€
5305010202	47	25	6.35	12.7	532010 0005	74,-
5305020300, 5305020600, 5305050302, 5305050602	80	32	9	9	532010 0001	58,-
5305051002, 5305011002, 5305100302, 5305100602, 5305101002	150	42	9	9	532010 0020	143,-

5102

### Holder for scribers

Substance	suitable for height meter and marking-out instrument	art.no.	€
Metal clamp	5305020300, 5305020600, 5305050302, 5305050602, 5305051002	532011 0001	39,-
Plastic	5305011002, 5305100302, 5305100602, 5305101002	532011 0002	17,-

5102



532011 0001

532011 0002

## Mitutoyo Digital height meter and marking-out instrument

Werks-norm 0,01 mm Digi-matic USB

- Sturdy design with large stand
- Easy to read thanks to high-contrast LCD display with large digits
- Slider with fine adjustment and clamping mechanism
- Scriber offset and carbide-tipped
- **Functions:** ON/OFF, ZERO/ABS, DATA, HOLD, PRESET for pre-setting user-defined values, reverse counting direction (+/-), battery check
- Supplied with SR44 battery, no. 500534 0001
- **Optional accessories:** Digimatic cable type C, no. 563100 0021 (1 m), no. 563100 0022 (2 m), USB cable type C-USB, no. 563110 0003

ABSOLUTE®



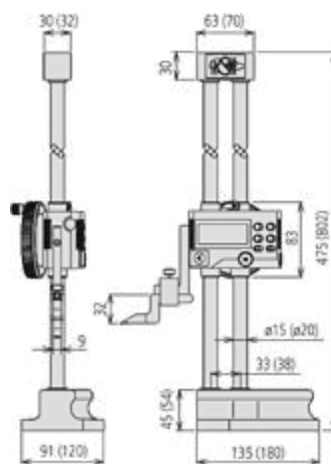
Measurement range mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
0-200	0.04	530501 0202	654,-	071270 D001	32,-
0-1000	0.08	530501 1002	2.836,-	071270 D003	65,-

5102

## Mitutoyo Digital height meter and marking-out instrument with two columns

Werks-norm Digi-matic USB

- Sturdy design with large stand
- All key parts hardened
- Rear-mounted hand wheel for quick adjustment, angled by 10° to allow easier operation
- Easy to read thanks to high-contrast LCD
- Scriber offset and carbide-tipped
- **Readings: 0.005 mm, can be switched to 0.01 mm**
- With integrated fine adjustment
- Can store 2 reference values
- Battery life approx. 5,000 hours
- **Functions:** ON/OFF, ZERO/ABS, PRESET for storing 2 reference values, HOLD/DATA, reverse measuring direction (+/-)
- Supplied in moulded packaging with SR44 battery, no. 500534 0001
- **Optional accessories:** Digimatic cable type F, no. 563100 0051 (1 m), no. 563100 0052 (2 m); USB cable type F-USB, no. 563110 0006



### Standard version

Measurement range mm	Column Ø mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
0-300	15	0.03	530505 0302	895,-	071270 D001	32,-
0-600	20	0.06	530505 0602	1.228,-	071270 D002	40,-
0-1000	20	0.08	530505 1002	2.321,-	071270 D003	65,-

5102

### With facility to connect electronic probes (accessories)

Designation	Measurement range mm	Column Ø mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
Height meter	0-300	20	0.03	530510 0302	1.192,-	071270 D001	32,-
Height meter	0-600	20	0.05	530510 0602	1.523,-	071270 D002	40,-
Height meter	0-1000	20	0.06	530510 1002	2.647,-	071270 D003	65,-
Electronic sensor	Suitable for all sizes			530510 0101	522,-		

5102



# Mitutoyo Digital height meter QM-Height

ABSOLUTE

Digimatic

USB

ABSOLUTE®

- Measuring heights, steps, groove widths, inner and outer diameters and their distances
- Designed for workshop use
- Available with or without air cushion support
- High accuracy due to electromagnetic inductive measurement principle
- Large LCD with large, easy-to-read digits
- Clearly laid out keypad with symbols for the individual measurement functions
- Multiple zero points programmable
- Optical and acoustic tolerance monitoring
- Choice of mains or (rechargeable) battery power supply
- Wide range of probes for various measurement tasks available as optional accessories

### Technical data

Measuring span (stroke): 0 - 465 mm (350 mm) for QM-H350 and 0 - 715 mm (600 mm) for QM-H600

Resolution: 0.001 mm, can be switched to 0.005 mm

Display: LCD

Error margin:  $\pm (2.4 + 2.1L/600) \mu\text{m}$  L = measurement length in mm

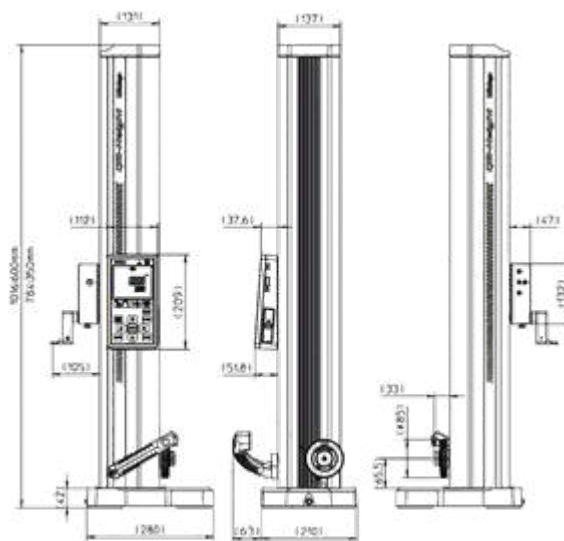
Surface repeatability: 1.8  $\mu\text{m}$  (2  $\sigma$ )

Perpendicularity: 8  $\mu\text{m}$  QM-H350 / 13  $\mu\text{m}$  QM-H600

Measurement system: electromagnetic inductive scale

Measuring force: 1.5 +/- 0.5 N

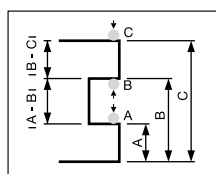
Weight: 22 kg QM-H350 and 27 kg QM-H600



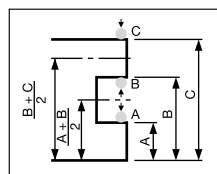
- Supplied with measuring probe and  $\varnothing$  5 mm carbide ball, reference block, 4x LR6 batteries (No. 548079 4006), protective cover, operating manual, factory certificate
- **Special accessories:** Digimatic cable Type D No. 563100 0031 (1 m), No. 563100 0032 (2 m) USB cable Type D-USB No. 563110 0004

Description	Measurement range mm	art.no.	€	DAkkS calibration	
				art.no.	€
QM-H 350 without air support	350	533005 0351	3.485,-	071280 D002	384,-
QM-H 350 with air support	350	533005 1351	3.849,-	071280 D002	384,-
QM-H 600 without air support	600	533005 0601	4.276,-	071280 D002	384,-
QM-H 600 with air support	600	533005 1601	4.640,-	071280 D002	384,-

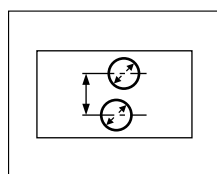
5105



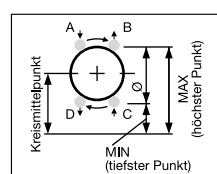
Measurement of distances



Example of a centre point measurement



Distance measurement from centre point to centre point



Measurement of circle, bore and shaft

### Accessories

Designation	art.no.	€
Mains adapter	533010 0150	71,-

5102



# Mitutoyo Linear height meter Linear Height LH 600E



- Measuring heights, steps, groove widths, inner and outer diameters, their distances and two-dimensional measurements such as reference circle calculation
- Robust and highly accurate height meter for workshop and laboratory use
- Accuracy of  $(1.1 + 0.6 L/600) \mu\text{m}$ , surface precision (2s) of 0.4  $\mu\text{m}$
- Increments adjustable from 0.0001 mm to 0.1 mm
- Pneumatic moving mechanism (floating/semi-floating)
- Direct interaction via the bright, easy-to-read **colour LCD display** (backlit)
- Single-key operation
- Large memory capacity for 50 measurement programs and 60,000 individual measurement records
- Independent adjustment options for travel and measuring speed, rapid positioning (up to 40 mm/s) and gentle contact
- Direct GO/NO-GO confirmation for each measurement
- Rechargeable batteries and an independent compressed air supply (integrated compressor) ensure operation as a stand-alone device
- Languages: German, English, French, Spanish, Italian and Japanese can be selected

**Measurement functions:**

- 1D and 2D measurements
- Height measurement (top/bottom surface)
- Diameter (bore/shaft)
- Calculating an angle
- 2D: Element calculation, distance calculation, pitch circle calculation
- 2D coordinate system setup
- Polar coordinate system support
- Perpendicularity, straightness, incline and planarity detection

**Probe insert:**

- Adjustment options for probe type
- Measurement and storage of probe ball diameter
- Alteration of probe position

**Statistical processing:**

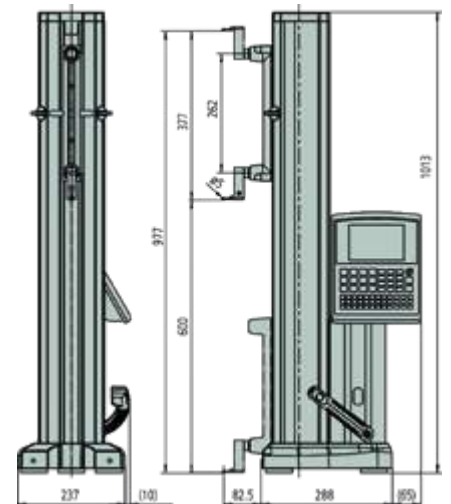
- Execution of simple statistical processes
- Histogram creation

**Technical data:**

- Measurement range (travel) 0 - 972 mm (600 mm)
- Length measurement tolerance  $(1.1 + 0.6 L/600) \mu\text{m}$ , L = measurement length in mm
- Precision (2s): surface 0.4  $\mu\text{m}$ ; bore: 0.9  $\mu\text{m}$ ; perpendicularity 5  $\mu\text{m}$
- Straightness 4  $\mu\text{m}$
- Measuring force 1 N
- Interface: Digimatic input / RS-232 C output, facility to connect a USB data stick
- Power supply: AC adapter/rechargeable battery (Ni-MH), operating time approx. 5 hours
- Weight 24 kg
- **Supplied** in transport packaging with 1x  $\varnothing 5$  mm ball probe, adjustment gauge, battery pack, mains adapter, factory certificate and operating manual



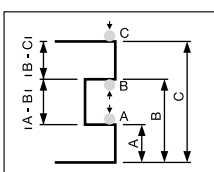
533003 0610



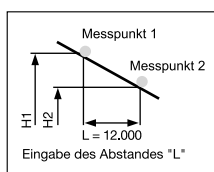
533002 0610



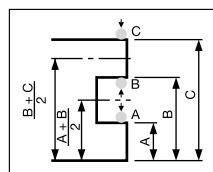
533002 0610



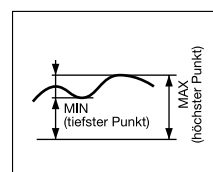
Measurement of distances



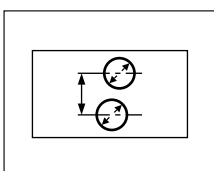
Example of an angle measurement



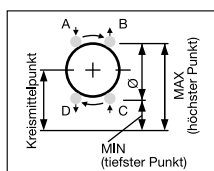
Example of a centre point measurement



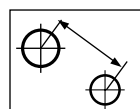
Determining the lowest and highest measurement point



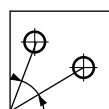
Distance measurement from centre point to centre point



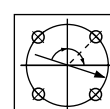
Measurement of circle, bore and shaft



Centre point to centre point measurement



Angle calculation



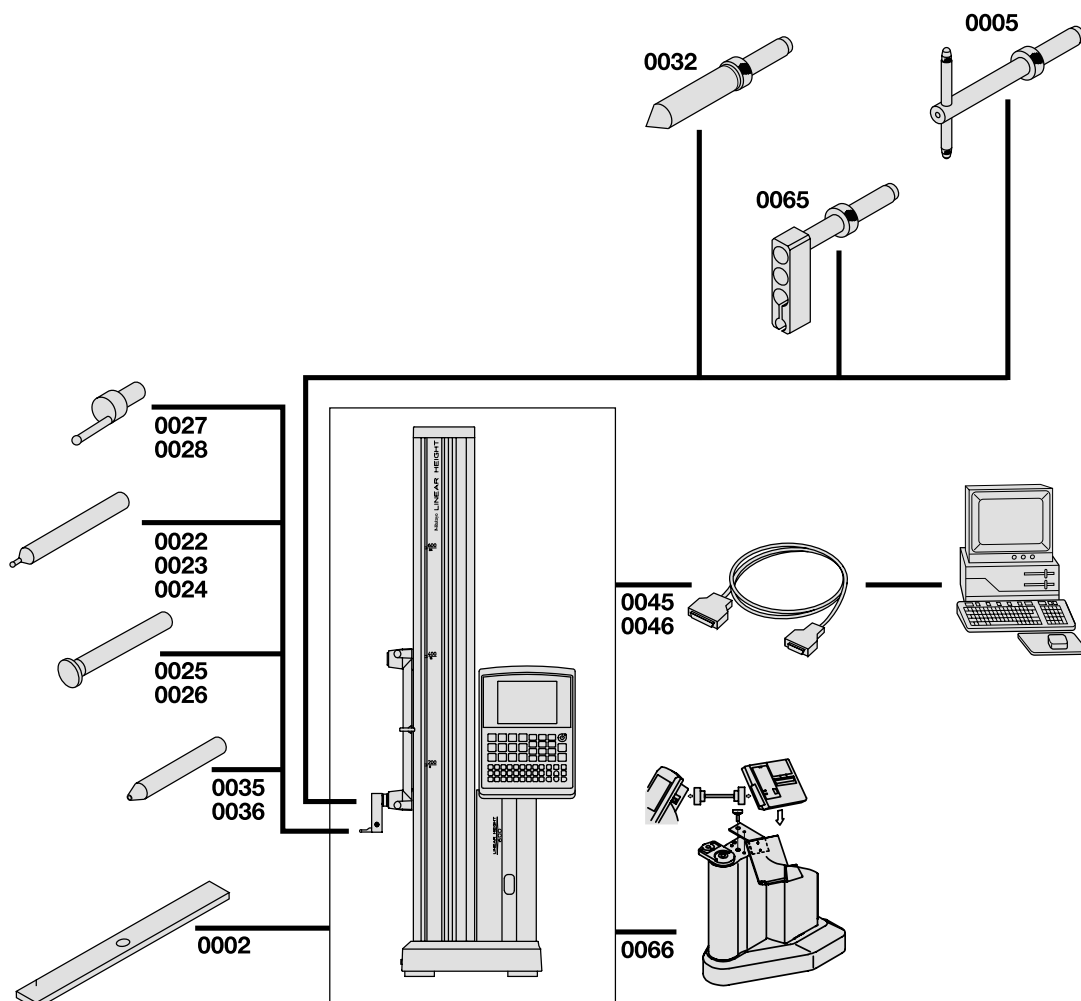
Pitch circle calculation

Type	Description	art.no.	€	DAkkS calibration art.no.	€
Linear height meter LH 600E	Without handle	533002 0610	6.068,-	071280 D002	384,-
Linear height meter LH 600EG	With handle	533003 0610	6.388,-	071280 D002	384,-

5105

## Mitutoyo Accessories for height meters

- For height meters "Linear Height 600E" and "QM-Height"



Designation	suitable for LH 600E	suitable for QM height	art.no.	€
Ball probe, Ø 2 mm	Yes	Yes	<b>533010 0022</b>	<b>97,-</b>
Ball probe, Ø 3 mm	Yes	Yes	533010 0023	102,-
Ball probe, Ø 4 mm	Yes	Yes	533010 0024	112,-
Ball probe, Ø 5 mm (standard probe)	Yes	Yes	533010 0029	124,-
Ball offset probe, Ø 4 mm	Yes	Yes	533010 0027	68,-
Ball offset probe, Ø 6 mm	Yes	Yes	533010 0028	74,-
Disc probe, Ø 14 mm	Yes	Yes	533010 0025	200,-
Disc probe, Ø 20 mm	Yes	Yes	533010 0026	252,-
Straight probe, Ø 10 mm	Yes	Yes	533010 0031	251,-
Tapered probe, Ø 20 mm	Yes	No	533010 0032	137,-
Adapter for Renishaw probes with M2 thread	Yes	Yes	533010 0035	47,-
Adapter for Renishaw probes with M3 thread	Yes	Yes	533010 0036	47,-
Depth probe	Yes	Yes	533010 0005	173,-
Counterbalance weights	Yes	No	533010 0002	31,-
Holder for Digimatic dial indicators	Yes	No	533010 0065	114,-
Thermo graph paper (10 rolls)	Yes	No	533010 0067	95,-
Signal cable RS-232C 2 m	Yes	Yes	533010 0045	62,-
Signal cable RS-232C 5 m	Yes	Yes	533010 0046	73,-

5106



## The multiCOM System

- The perfect interface between **ATORN handheld measuring equipment and a PC**
- Three-fold compatibility: **RS 232 C** und **Digimatic** and **USB**
- For multiple measuring points, can be expanded to over 100 measuring instruments using low-cost USB hubs
- Data transfer can be triggered from the measuring instrument, via a USB foot switch or using the PC keyboard

**ATORN®**



- Measurement value transfer via USB data cable in conjunction with **USB-Com** software or the full version **USB-Com Professional**
- **USB-Com** for connecting a measuring instrument, include in the standard scope of supply of the USB data cable

### ATORN® Signal cable multiCOM

- For connecting **ATORN measuring instruments with a multiCOM** interface to a PC or laptop
- USB cable including USB-COM driver software for transferring measurement values e.g. to Microsoft Excel

Type	Data output	Cable length m	art.no.	€
P-RS 232 C	RS 232 C	2	<b>512521 0001</b>	<b>56,-</b>
P-Digimatic	Digimatic	2	512521 0002	<b>71,70</b>
P-USB	USB	2	512521 0003	<b>80,40</b>
5182				



### ATORN® Signal cable

- Signal cables allow the displayed measurement values to be transferred ONLINE to mini processors, interfaces or directly to a computer.
- POWER-RS and POWER-USB for data transfer and power supply

Type	Cable length m	art.no.	€
Proximity-RS	2.0	<b>500700 9965</b>	<b>117,-</b>
Proximity-USB	2.0	500700 9966	<b>117,-</b>
5181			



### Kroeplin Längenmesstechnik Signal connector

- Interface adapter for attachment to fast display calliper no. 521012...., 521014...., 521016...., 521017.... and 521019....
- Suitable MITUTOYO signal cable type E no. 563100 0042, E-USB no. 563110 0005 and U-Wave type C no. 567504 0005

Description	art.no.	€
Interface adapter	<b>524002 0005</b>	<b>58,20</b>
Interface adapter for Mitutoyo applications	524002 0006	<b>94,40</b>
5123		



### Kroeplin Längenmesstechnik Bluetooth interface adapter



- Bluetooth interface adapter for installation on probe arm dial indicators

Designation	suitable for	art.no.	€
Interface adapter for Bluetooth applications	521012.... / 521017.... / 521019....	<b>524002 0010</b>	<b>94,40</b>
Interface adapter for Bluetooth applications	521018....	524002 0015	<b>98,50</b>
5123			



## Mitutoyo Signal cable Digimatic and USB

- For connecting Mitutoyo „Digimatic“ measuring instruments to a PC via corresponding interfaces or to Mitutoyo data processing devices

### Signal cable Type A

- Signal cable for IP-protected vernier callipers with DATA button
- Suitable for IP67 vernier calliper, IP67 workshop vernier calliper, IP67 built-in vernier calliper, IP67 depth bars

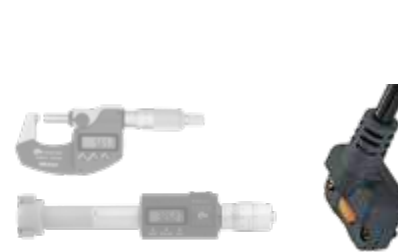
Cable length m	Digimatic		USB	
	art.no.	€	art.no.	€
1	563100 0001	88,-	563110 0001	122,-
2	563100 0002	92,-		
	5102		5102	



### Signal cable Type B

- Signal cable for IP-protected micrometers with DATA button
- Suitable for outside micrometers with and without IP, QuantuMike, IP micrometer heads, Holtest

Cable length m	Digimatic		USB	
	art.no.	€	art.no.	€
1	563100 0011	91,-		
2	563100 0012	92,-	563110 0002	122,-
	5102		5102	



### Signal cable Type C

- Signal cable with DATA key
- Suitable for AOS vernier calliper, vernier callipers, workshop vernier calliper, AOS built-in vernier calliper, built-in vernier callipers, micrometer heads, ID-S dial indicator

Cable length m	Digimatic		USB	
	art.no.	€	art.no.	€
1	563100 0021	43,-		
2	563100 0022	50,-	563110 0003	107,-
	5102		5102	



### Signal cable Type D

- Signal cable with 10-pin rectangular plug
- Suitable for dial indicators ID-H / ID-F, surface roughness tester SJ, height meter QM-Height

Cable length m	Digimatic		USB	
	art.no.	€	art.no.	€
1	563100 0031	50,-		
2	563100 0032	64,-	563110 0004	107,-
	5102		5102	



### Signal cable Type E

- Signal cable for 6-pin round plug
- Suitable for quick-micrometer

Cable length m	Digimatic		USB	
	art.no.	€	art.no.	€
1	563100 0041	53,-		
2	563100 0042	64,-	563110 0005	107,-
	5102		5102	



### Signal cable Type F

- Signal cable, straight version
- Suitable for dial indicators ID-S / ID-U, Borematic

Cable length m	Digimatic		USB	
	art.no.	€	art.no.	€
1	563100 0051	33,-		
2	563100 0052	39,-	563110 0006	107,-
	5102		5102	



### Signal cable Type G

- Signal cable IP-protected
- Suitable for dial indicators ID-B / ID-N

Cable length m	Digimatic		USB	
	art.no.	€	art.no.	€
1	563100 0061	58,-		
2	563100 0062	68,-	563110 0007	107,-
	5102		5102	



**Advantage of the new Digimatic USB connectors:**

Task	Required accessories	USB-ITPAK software	Data format
Read measurement values into any desired software that expects keyboard entry	One USB signal cable per measuring instrument	Software or special driver is not required	Measurement value as keyboard format (HID=Human Interface Device)
Measurement values in ordinary statistics software such as Mitutoyo MeasurLink	One USB signal cable and USB-ITPAK software per measuring instrument	For each cable (measuring instrument), generates a unique, fixed assigned COM port (VCP)	Mux-10 specification with fixed COM assignment
Read measurement values into any desired software that expects keyboard entry	One USB signal cable and USB-ITPAK software per measuring instrument, or an ordinary USB hub	Measuring instrument and foot switch are selected and assigned, stores a process as a sub-program	Transfer of a measurement value test in text format
Measurement values in Excel		Measuring instrument and foot switch are selected and assigned, assumes the entire organisation of an Excel table, meaning that transferred values are written to pre-defined target cells	Measurement log in Excel format with max. 31 characters

**Mitutoyo Software USB-ITPAK**

- For managing multiple connected measuring equipment units and foot switches
- For transferring measurement values in text format (when used as VCP)
- For easily creating logs in Excel
- Starts Excel automatically, offers the option to store accumulated measurement values in Excel
- Organises the Excel table in full with specified columns and rows, including the measurement task start and end
- Option to select the connected measuring instruments and foot switches
- Stores the individual parts of a measurement task as a repeatable program sequence
- Sequences can be repeated several times automatically
- Function keys F1 to F8 can be selected for assignment to data transfer, deletion or skipping
- Compatible with Windows 2000 / XP / Vista / Windows 7 / Windows 8 / Windows 10



Designation	suitable for	art.no.	€
Software for data transfer	MITUTOYO measuring instruments with USB cables	563120 0001	253,-

5102

**Mitutoyo Interface system DMX 1**

- For transferring measurements to a PC from measuring equipment with a data output
- Managed by microcontroller
- 1 measuring instrument can be connected
- RS-232 interface to computer
- Foot switch connection
- **Interface parameters:**
  - 9600 Baud transmission rate
  - 8 data bits
  - 1 stop bit
  - No parity

Model	Input	Outlet	art.no.	€
DMX 1	1x Mitutoyo	Direct, 9-pin	563501 2005	96,-

5106



**Accessories**

Designation	art.no.	€
Foot switch	563003 0001	48,-
USB foot switch adapter	563110 0100	110,-

5102

**Mitutoyo Digimatic USB interface**

- For connecting a Mitutoyo Digimatic measuring instrument to a PC USB interface
- Depending on the model, interfaces are recognised by the PC as a keypad or serial interface
- Integrated foot switch socket



Model	Input	Mode	art.no.	€
USB-Input Tool	1x Mitutoyo	Keypad	563501 0010	219,-
DMX 1 USB	1 x Mitutoyo	COM interface	563501 0011	110,-
DMX 2 USB	2 x Mitutoyo	Keypad / COM interface	563501 0020	400,-
DMX 3 USB	3 x Mitutoyo	COM interface	563501 0030	486,-

5102



## Mitutoyo Wireless data transmission U-WAVE



- Quick and reliable method of data transfer without cumbersome signal cables
- Transmits in the 2.4 GHz frequency band with a choice of 15 channels
- Up to 100 transmitters can be connected via one receiver
- Range 20 m
- Receiver is connected and powered via USB
- Slim transmitter design
- Battery life approx. 400,000 data transmissions
- Correct data transfer confirmed on the transmitter by LED and buzzer or LED only (IP67 transmitter model)
- **Transmitter can be used universally by exchanging the connection cable**



### Receiver

- Supplied with USB connection cable, driver software and operating manual

Designation	art.no.	€
Receiver, 2.4 GHz	567502 0001	324,-

5102



### Transmitter U-Wave FIT

- Specially adapted to casings of vernier callipers and/or outside micrometers and QuantuMike

Model	Protection type	Warning sound	suitable for	art.no.	€
U-WAVE-TC	IP 67	No	Vernier callipers with/without IP67 up to 300 mm	567503 0012	163,-
U-WAVE-TC	No protection rating	Yes	Vernier callipers with/without IP67 up to 300 mm	567503 0013	163,-
U-WAVE-TM	IP 65	No	Outside micrometers with/without IP65	567503 0014	163,-
U-WAVE-TM	No protection rating	Yes	Outside micrometers with/without IP65	567503 0015	163,-

5102



Connection unit with transmitter outside micrometer

### Connection unit for U-Wave FIT and U-Wave Bluetooth

- firm connection between U-Wave Fit and U-Wave Bluetooth transmitters and measurement devices

Designation	suitable for	art.no.	€
Connection unit, standard	Vernier callipers AOS ABSOLUTE	567504 0011	92,-
Connection unit, waterproof	Vernier callipers IP67 / outside micrometers IP65	567504 0010	97,-

5102



Vernier callipers transmitter with connection unit

Transmitter with device-mounted connection unit

### Transmitter

- Digimatic2 compatible
- Supplied with battery CR2032 No. 548079 6032

Model	Protection type	Warning sound	art.no.	€
1	IP 67	No	567503 0010	163,-
2	No protection rating	Yes	567503 0011	163,-

5102



### Connection cable

Type	suitable for	art.no.	€
IPM	Vernier calliper IP 66 / 67, depth gauge IP 67, inside vernier calliper IP 67	567504 0001	97,-
IPB	Outside micrometer IP 65, depth micrometer, special micrometers, Holtest IP 65	567504 0002	97,-
B	Standard vernier calliper, standard slide gauge, standard inside vernier calliper	567504 0003	92,-
D	IDH / IDf dial indicators	567504 0004	87,-
C	Quick micrometer, micrometer head 505401....	567504 0005	87,-
A	IDC / IDS / IDU dial indicators, height measurement and marking-out instruments, Borematic, goniometers	567504 0006	87,-
IPN	IDB / IDN dial indicators	567504 0007	92,-

5102



567504 0003

## Mitutoyo Wireless data transmission U-Wave Bluetooth

NEW



- Fast and secure data transfer without additional receiver on the end device
- Compatible with smartphones, tablets and Windows
- Bluetooth standard V. 4.2
- Transmitter adapted to the casing of Vernier callipers and outside micrometers
- Range 10m
- 1-year battery life
- Correct data transfer is confirmed on the transmitter by LED and buzzer and/or by LED only (IP67 transmitter model)
- **Attention!** For data transfer you require an app (IOS/Android) and/or software (Windows) on the end device. For IOS and Android devices, please download U-WAVEPAK-BM from your corresponding app store, for Windows applications download the software U-WAVE-BW from [www.sartorius-werkzeuge.de](http://www.sartorius-werkzeuge.de)

### Transmitter U-Wave Bluetooth

required accessories

- 567504 0011 standard connection unit for MITUTOYO Vernier callipers AOS ABSOLUTE
- 567504 0010 waterproof connection unit for MITUTOYO Vernier callipers IP67 / outside micrometers IP65

Model	Protection type	Warning sound	suitable for	art.no.	€
U-Wave-TCB	IP 67	No	Vernier callipers with/without IP67 up to 300 mm	567503 0120	163,-
U-Wave-TCB	No protection rating	Yes	Vernier callipers with/without IP67 up to 300 mm	567503 0121	163,-
U-Wave-TMB	IP 65	No	Outside micrometers with/without IP65	567503 0122	163,-
U-Wave-TMB	No protection rating	Yes	Outside micrometers with/without IP65	567503 0123	163,-

5102



567503 0120



567503 0122

## ATORN® Radio receiver i-Stick

NEW



- USB radio receiver for ATORN integrated wireless
- suitable for ATORN measuring instruments with integrated radio module and corresponding compatible devices
- Range 6m
- Manages up to 8 measuring devices
- up to 4 i-Sticks can be connected to one PC
- Frequency band 2400 MHz



Designation	art.no.	€
Radio receiver i-Stick	567512 0001	96,70

5186

## Mitutoyo Mini processor DP-1 VA

- Statistics calculator, printer and data logger in one device
- Documentation of measured values and statistical values by integrated printer
- All Mitutoyo Digimatic measuring instruments can be connected
- Integrated thermal printer, quick and quiet
- Stored data is documented with date and time information
- Logger function (data storage) 1000 measured values with date and time.
- Battery and mains operation
- Foot switch connection socket
- RS-232C interface for data output

### Printable data and calculations

- Measurement values (max. 9999)
- OK/NOK values
- Data volume. max./min. values
- X-bar mean value
- Standard deviation s
- Clamping width r
- Rejects in number and per cent
- Process capability index cp and cpk
- Histogram
- X-bar and r control chart
- Control limits
- Date and time
- Basic unit supplied with printer, power adapter and operating manual, in moulded packaging

Designation	art.no.	€
DP1-VA	563001 0011	480,-
Recording paper, 5 rolls	563003 0021	31,-
Signal cable RS-232C (1 metre) for DP-1 VA for connection to PC	563003 0023	333,-

5102



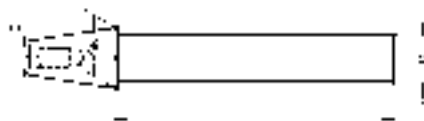
563001 0011



## diebold Test mandrels

### • Stepped hollow bore

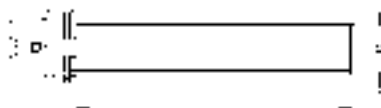
- Forged, case-hardened (HRC 58+2)
- Precision-ground diameter and flat surface
- Taper tolerance AT3, radial run-out < 0.003 mm
- Supplied in wooden box for vertical storage with test certificate



### DIN ISO 7388-1 / DIN 69871 A

Shank	D mm	L mm	Thread	art.no.	€
SK 30	32	204	M 12	<b>436313 3032</b>	<b>370,-</b>
SK 40	40	320	M 16	436313 4040	<b>349,-</b>
SK 50	40	320	M 24	436313 5040	<b>440,-</b>

4127



### DIN 69893 type A (HSK-A)

- With 4 slots at the tapered end
- For measuring at 0°, 90°, 180° and 270°

Shank	D mm	L mm	art.no.	€
HSK-A 40	24	180	<b>436319 4024</b>	<b>390,-</b>
HSK-A 50	32	236	436319 5032	<b>399,-</b>
HSK-A 63	40	346	436319 6340	<b>425,-</b>
HSK-A 80	40	346	436319 8040	<b>475,-</b>
HSK-A 100	40	349	436319 1040	<b>480,-</b>

4127



## Tool length pre-setting device

- For determining the length and pre-setting when using an optional depth gauge (see below)
- hardened
- Taper and collar ground and black-oxidised
- Height approx. 100mm
- Diameter: SK 40 = approx. 80mm, SK 50 = approx. 105mm
- Mounting slot for depth gauge 16 x 4.5mm
- **Advantage:** Tool lengths can be measured directly beside the machine.
- simple handling
- low space requirement
- Supplied in the box, without depth gauge

Designation	art.no.	€
Tool length pre-setting device, SK 40	<b>531201 0040</b>	<b>250,-</b>
Tool length pre-setting device, SK 50	531201 0050	<b>290,-</b>

5163



## ATORN® IP67 digital sliding depth gauge Tool length pre-setting device



- With and without measuring hook
- Precision-ground measuring faces
- **KEEPTRONIC** electronics store the zero point, operating keys lock to prevent accidental alteration of the zero point. Battery life approx. 3 years
- Inductive, waterproof FPS measuring system (Fluid Protected Measuring System)
- **multiCOM** data output, can be used as USB, Digi-matic or RS-232
- **Functions:**  
0/ON/Off, mm/inch, PRESET for pre-setting user-defined values
- Supplied with CR 2032 battery, No. 548079 6032
- **Optional accessories:** Data cables, type P-RS 232 / P-Digi-matic / P-USB, no. 512521....

Measurement range mm	Base length mm	Measuring hook	art.no.	€	DAkkS calibration art.no.	€
300	150	No	501610 0301	<b>495,-</b>	072008 D002	<b>19,-</b>

5196

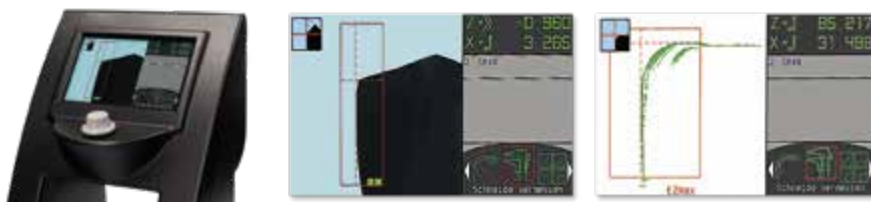




## ATORN® Tool pre-setting devices 350/420/600 with ImageController

- Robust tool pre-setting devices for workshop use
- Quick measuring, setting and testing tools
- SK50 high accuracy spindle with integrated calibration edge
- Pneumatic spindle clamping unit
- Simple setup of different zero points (max. 99)
- Different measuring programs e.g. to carry out concentricity and axial run-out measurements on the tool cutting edge
- CCD camera with telecentric lens
- Dynamic crosshair for automatic measurements
- EZmax software function for calculating and measuring the tool contour
- Supplied ex works, excluding packaging

Base support and reduction with integrated calibration edge



### ImageController Basic

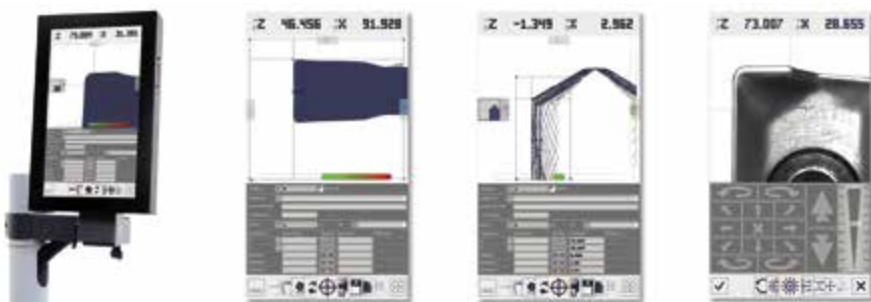
- 7" TFT colour screen with 12x enlargement and dial/push-button operation
- The simple software allows for fast training at minimal training expense
- ATORN 420 and 600 with gap gauge 100 mm

Model	Measurement range mm	Total height mm	Weight kg	Magnification	art.no.	€
ATORN 350 ImageControllerbasic	350x320	870	80	12x	520090 0350	6.350,-
ATORN 420 ImageControllerbasic	420x420	1060	100	12x	520090 0420	6.850,-
ATORN 600 ImageControllerbasic	600x420	1260	120	12x	520090 0601	8.350,-

5165



520090 0350



### ImageController 1

In addition to ImageController Basic:

- 13.3" TFT touchscreen monitor with 20x magnification
- Stable undertable with adapter tray
- Spindle brake and 4x90° spindle indexing
- Label printing system
- Illuminated cutting edge inspection
- Tool management, projector function
- Turning centre measurement (optional)
- Network-compatible (optional)
- Communication with machine tool (optional)

Model	Measurement range mm	Magnification	Total height mm	Weight kg	art.no.	€
ATORN 350 ImageController1	350x320	20x	1600	180	520090 1350	9.350,-
ATORN 420 ImageController1	420x420	20x	1750	274	520090 1420	9.850,-
ATORN 600x420 ImageController1	600x420	20x	1950	289	520090 1601	11.350,-
ATORN 600x570 ImageController1	600x570	20x	1950	289	520090 1657	12.850,-

5165



520090 1350

Continued on next page >>>



**ImageController 2**

- **Screen size 13.3"**
- Touchscreen display (magnification 20x)
- additional options for ImageController 1:
  - Creation of tooling sheets (optional)
  - Autofocus spindle (optional)

Model	Measurement range mm	Display (diagonal) in	Total height mm	Weight kg	art.no.	€
ATORN 350 ImageController2	350x320	13.3"	1600	180	<b>520090 2350</b>	<b>10.650,-</b>
ATORN 420 ImageController2	420x420	13.3"	1750	274	520090 2420	11.150,-
ATORN 600x420 ImageController2	600x420	13.3"	1950	289	520090 2601	12.650,-
ATORN 600x570 ImageController2	600x570	13.3"	1950	289	520090 2657	14.150,-

5165



520090 2420

**ImageController 2**

- **Screen size 24"**
- Panel PC (magnification 38x)
- additional options for ImageController 1:
  - Creation of tooling sheets (optional)
  - Autofocus spindle (optional)

Model	Measurement range mm	Display (diagonal) in	Total height mm	Weight kg	art.no.	€
ATORN 350 ImageController2	350x320	24"	1600	180	<b>520090 2324</b>	<b>11.550,-</b>
ATORN 420 ImageController2	420x420	24"	1750	274	520090 2424	12.050,-
ATORN 600x420 ImageController2	600x420	24"	1950	289	520090 2624	13.550,-
ATORN 600x570 ImageController2	600x570	24"	1950	289	520090 2524	15.050,-

5165



520090 2424

**Accessories**

- All adapters come with integrated calibration edge
- The barcode print software option allows the printing of QR Code labels
- Measured tool data can be read directly into the machine memory via the tool identification „zidcode“ and the associated scanner. Typos are a thing of the past
- Additional special accessories e.g. vacuum spindle, other adapters available on request

Designation	suitable for model	art.no.	€
Spindle brake for tool pre-setting device with ImageControllerbasic	IC Basic	<b>520091 0001</b>	<b>336,-</b>
Spindle positioning 4x90° for tool pre-setting device with ImageControllerbasic	IC Basic	520091 0002	295,-
Cutting edge inspection for tool pre-setting device with ImageControllerbasic	IC Basic	520091 0003	204,-
Thermo printer incl. Ezprint licence for tool pre-setting device with ImageControllerbasic	IC Basic	520091 0011	331,-
Labels for TSC printer 25x75 mm / matt white / 950 pcs.	IC Basic / 1 / 2 / 3	520091 0012	50,90
Adapter SK50 / SK40	IC Basic / 1 / 2 / 3	520092 0001	390,-
Adapter SK50 / HSK32 A/C/E/T-HSK40 B/D/F without tool clamping	IC Basic / 1 / 2 / 3	520092 0017	559,-
Adapter SK50 / HSK40 A/C/E/T-HSK50 B/D/F without tool clamping	IC Basic / 1 / 2 / 3	520092 0018	559,-
Adapter SK50 / HSK50 A/C/E/T-HSK63 B/D/F without tool clamping	IC Basic / 1 / 2 / 3	520092 0019	559,-
Adapter SK50 / HSK63 A/C/E/T-HSK80 B/D/F without tool clamping	IC Basic / 1 / 2 / 3	520092 0020	559,-
Adapter SK50 / VDI20	IC Basic / 1 / 2 / 3	520092 0031	809,-
Adapter SK50 / VDI30	IC Basic / 1 / 2 / 3	520092 0033	809,-
Adapter SK50 / VDI40	IC Basic / 1 / 2 / 3	520092 0034	809,-
Adapter SK50 / VDI50	IC Basic / 1 / 2 / 3	520092 0035	809,-
Software option barcode printer	IC2 / 3	520091 0110	275,-
Tool identification zidcode with removable scanner	IC2 / 3	520091 0112	1.369,-
Cleaning agent „BLUE-TACK“	IC Basic / 1 / 2 / 3	520091 1210	10,20

5165



520092 0035

520092 0001



520091 0112

## Gauge blocks

At operational level, gauge blocks are the most important tool for connecting to the metre unit of length. They embody a certain length with a very high level of accuracy, hence the term **material measure**.

Gauge blocks are offered in different tolerance classes (formerly known as **degrees of accuracy**), which differ as follows:

- Tolerance class K** used in our measuring laboratory for checking gauge blocks
- Tolerance class 0** for all exact length measurements, for checking gauge blocks used in operation, for adjusting highly precise measuring instruments
- Tolerance class 1** for checking gauges and adjusting measuring instruments
- Tolerance class 2** as a working and setting gauge in production



Nominal dimension range in mm		Tolerance class 0	Tolerance class 1	Tolerance class 2
above	to	Deviation from the nominal dimension in $\mu\text{m}$	Deviation from the nominal dimension in $\mu\text{m}$	Deviation from the nominal dimension in $\mu\text{m}$
-	10	0.12	0.20	0.45
10	25	0.14	0.30	0.60
25	50	0.20	0.40	0.80
50	75	0.25	0.50	1.00
75	100	0.30	0.60	1.20
100	150	0.40	0.80	1.60
150	200	0.50	1.00	2.00
200	250	0.60	1.20	2.40
250	300	0.70	1.40	2.80
300	400	0.90	1.80	3.60
400	500	1.10	2.20	4.40
500	600	1.30	2.60	5.00
600	700	1.50	3.00	6.00
700	800	1.70	3.40	6.50
800	900	1.90	3.80	7.50
900	1000	2.00	4.20	8.00



	Ceramic ( $\text{ZrO}_2$ )	Steel (Fe)
Vickers hardness (HV)	1350	800
Longitudinal expansion coefficient ( $10^{-6}/\text{K}$ )	9.3 +/- 0.5	10.8 +/- 0.5

## Advantages of ceramic gauge blocks

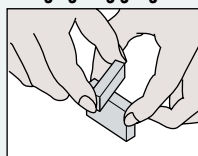
- Corrosion-resistant** Ceramic gauge blocks cannot corrode and consequently require no corrosion protection treatment
- Non-magnetic** No magnetic dirt, such as chips, will stick to ceramic
- Abrasion-resistant** Mitutoyo ceramic gauge blocks have up to ten-times higher abrasion resistance than steel gauge blocks
- Dimensional accuracy** Ceramic gauge blocks are wholly unaffected by time-related dimensional changes
- Expansion coefficient** Similar to that of steel



## Perfect wringing of gauge blocks

- The wringing should always be performed in a clean place on a soft surface – if a gauge block falls from the hand, it will not be damaged.
- Wipe the preservation substance from the gauge blocks using a soft cloth and petroleum ether.
- Do not use alcohol or ordinary white gas for cleaning purposes for the cleaning; normal white gas for cleaning purposes contains too many impurities, while alcohol always contains aqueous components that can cause corrosion.
- Microfibre cloths are best suited for wiping off the gauge block.
- Check the cleaned gauge block for rust and scratches.
- Burrs on the measuring face are removed with a special Ceraston (ceramic deburring stone) for gauge blocks. Move the gauge block over the Ceraston using very light pressure.

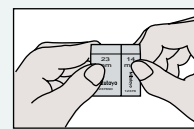
### Wringing long gauge blocks



Cross the gauge blocks at about  $90^\circ$  to each other in the middle of the measuring faces.

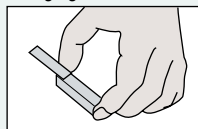


Pressing lightly, rotate the gauge block. You will develop a sense of the wringing while sliding the blocks.

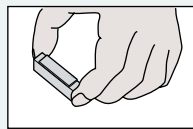


Align the measuring faces with each other.

### Wringing one thick and one thin gauge block

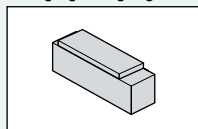


Overlap one side of a thin gauge block on one side of a thick gauge block.

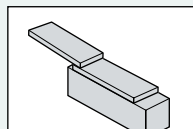


While pressing the entire overlapped area, move the thinner gauge block to align the measuring faces with each other.

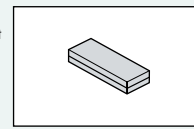
### Wringing thin gauge blocks



To avoid bending the thin gauge, first wring the smaller gauge block onto the long gauge block.



Then slide the other thin gauge block onto the first thin gauge block.



Finally, remove the long gauge block from the stack.

## SARA® Steel gauge block sets



- Made of carefully selected, high-quality, alloyed special steel, aged, hardened and hand-lapped
- Edges slightly blunted
- Each gauge block is engraved with an individual identification number
- Supplied in a wooden case with individually labelled compartments
- The works inspection certificate provided lists all the gauge blocks with the nominal dimensions and the deviation from the nominal dimensions. It documents traceability to national standards and the test conditions

32-piece set			47-piece set			87-piece set			103-piece set		
Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm
1	1,005	-	1	1,005	-	9	1,001-1,009	0,001	1	1,005	-
9	1,01-1,09	0,01	21	1,00-1,20	0,01	49	1,01-1,49	0,01	49	1,01-1,49	0,01
9	1,1-1,9	0,1	8	1,3-2,0	0,1	19	0,5-9,5	0,5	49	0,5-24,5	0,5
9	1-9	1,0	8	3-10	1	10	10-100	10	4	25-100	25
3	10-30	10	9	20-100	10						
1	50	-									



535001 1087

Tolerance class	Contents	art.no.		DAkkS calibration	
		art.no.	€	art.no.	€
0	32	535001 0032	470,-	075013 D032	324,-
1	32	535001 1032	315,-	075013 D032	324,-
2	32	535001 2032	197,-	075013 D032	324,-
0	47	535001 0047	729,-	075013 D047	474,-
1	47	535001 1047	450,-	075013 D047	474,-
2	47	535001 2047	280,-	075013 D047	474,-
0	87	535001 0087	1.069,-	075013 D087	874,-
1	87	535001 1087	709,-	075013 D087	874,-
2	87	535001 2087	425,-	075013 D087	874,-
0	103	535001 0103	1.409,-	075013 D103	1.034,-
1	103	535001 1103	849,-	075013 D103	1.034,-
2	103	535001 2103	499,-	075013 D103	1.034,-

5129

## SARA® Steel gauge block set, long



- For adjusting larger measuring instruments
- With locating bores for gauge block connector, no. 5360060010
- Made from carefully selected, high-quality alloyed special steel
- Aged, hardened and hand-lapped
- Each gauge block is engraved with an individual identification number
- The works inspection certificate provided lists all the end gauges with the nominal dimensions and the deviation from the nominal dimensions. It documents traceability to national standards and the test conditions.
- Calibration: Test B = 5-point measurement, Test C = 1-point measurement

Tolerance class	Contents	Dimension mm		art.no.		DAkkS calibration	
		art.no.	€	art.no.	€		
1	8	125 150 175 200 250 300 400 500	535001 0008	1.419,-	075017 D005	509,-	

5129



## Gauge block connector

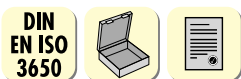
- Connects long gauge blocks to locating bores quickly and securely
- Dimensions 72 x 30 x 29 mm

Designation	art.no.	€
Gauge block connector	536006 0010	135,-

5129



## Mitutoyo Steel gauge block sets



- Made of carefully selected, high-quality alloyed special steel
- Aged, hardened and hand-lapped
- Edges slightly blunted
- Each gauge block is engraved with an individual identification number
- Supplied in a wooden case with lettering on the individual compartments, incl. MITUTOYO test certificate confirming the centre deviation of each gauge block

32-piece set			47-piece set			87-piece set			103-piece set		
Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm
1	1,005	-	1	1,005	-	9	1,001-1,009	0,001	1	1,005	-
9	1,01-1,09	0,01	21	1,00-1,20	0,01	49	1,01-1,49	0,01	49	1,01-1,49	0,01
9	1,1-1,9	0,1	8	1,3-2,0	0,1	19	0,5-9,5	0,5	49	0,5-24,5	0,5
9	1-9	1,0	8	3-10	1	10	10-100	10	4	25-100	25
3	10-30	10	9	20-100	10						
1	50	-									



536001 0031

Tolerance class	Contents	art.no.		DakkS calibration	
		art.no.	€	art.no.	€
0	32	536001 0040	1.089,-	075013 D032	324,-
1	32	536001 0041	839,-	075013 D032	324,-
2	32	536001 0042	713,-	075013 D032	324,-
0	47	536001 0030	1.858,-	075013 D047	474,-
1	47	536001 0031	1.429,-	075013 D047	474,-
2	47	536001 0032	1.218,-	075013 D047	474,-
0	87	536001 0021	2.862,-	075013 D087	874,-
1	87	536001 0022	2.202,-	075013 D087	874,-
2	87	536001 0023	1.875,-	075013 D087	874,-
0	103	536001 0011	3.630,-	075013 D103	1.034,-
1	103	536001 0012	2.786,-	075013 D103	1.034,-
2	103	536001 0013	2.367,-	075013 D103	1.034,-

5102

## Mitutoyo Ceramic gauge block sets



- Accuracies and possible uses as described under 536001...
- Made of zirconium/ceramic
- Each individual gauge block is engraved with an individual identification no.
- Supplied in a wooden case with individually labelled compartments
- For information on set composition and dimension steps, please see no. 536001...

32-piece set			47-piece set			87-piece set			103-piece set		
Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm
1	1,005	-	1	1,005	-	9	1,001-1,009	0,001	1	1,005	-
9	1,01-1,09	0,01	21	1,00-1,20	0,01	49	1,01-1,49	0,01	49	1,01-1,49	0,01
9	1,1-1,9	0,1	8	1,3-2,0	0,1	19	0,5-9,5	0,5	49	0,5-24,5	0,5
9	1-9	1,0	8	3-10	1	10	10-100	10	4	25-100	25
3	10-30	10	9	20-100	10						
1	50	-									



536020 0103

Tolerance class	Contents	art.no.		DakkS calibration	
		art.no.	€	art.no.	€
0	32	536020 0032	1.509,-	075013 D032	324,-
1	32	536020 1032	1.162,-	075013 D032	324,-
0	47	536020 0047	3.060,-	075013 D047	474,-
1	47	536020 1047	2.660,-	075013 D047	474,-
0	87	536020 0087	5.082,-	075013 D087	874,-
1	87	536020 1087	3.927,-	075013 D087	874,-
0	103	536020 0103	6.105,-	075013 D103	1.034,-
1	103	536020 1103	4.686,-	075013 D103	1.034,-

5102



## Mitutoyo SARA® Individual gauge blocks, steel and ceramic

DIN  
EN ISO  
3650



- Cross-section of steel and ceramic individual gauge blocks: from 0.1 to 10.1 mm: 30 x 9 mm, above 10.1 to 1000 mm: 35 x 9 mm
- Individual gauge blocks are available in the degrees of accuracy 0 and 1 (steel) or 0 (ceramic)
- **Each individual gauge block is engraved with an individual identification no.**
- **Every Mitutoyo gauge block is supplied with a free MITUTOYO test certificate documenting the centre deviation and degree of accuracy, as well as traceability to the PTB standard**
- Mitutoyo gauge blocks: Supplied individually in moulded packaging with a MITUTOYO test certificate



Short	Mitutoyo	Mitutoyo	SARA®	SARA®						
Nominal dimension mm	Steel, accuracy 0 art.no.	Steel, accuracy 1 art.no.	Steel, accuracy 1 art.no.	Ceramics, accuracy 0 art.no.	DakkS calibration art.no.	€				
0.5	536050 0001	40,-	536052 0001	33,50	536053 0001	27,30	536056 0001	60,10	075017 D010	14,-
1.0	536050 0002	26,40	536052 0002	22,40	536053 0002	18,95	536056 0002	43,10	075017 D010	14,-
1.001	536050 0003	26,40	536052 0003	22,40	536053 0003	22,20	536056 0003	47,30	075017 D010	14,-
1.002	536050 0004	26,40	536052 0004	22,40	536053 0004	22,20	536056 0004	47,30	075017 D010	14,-
1.003	536050 0005	26,40	536052 0005	22,40	536053 0005	22,20	536056 0005	47,30	075017 D010	14,-
1.004	536050 0006	26,40	536052 0006	22,40	536053 0006	22,20	536056 0006	47,30	075017 D010	14,-
1.005	536050 0007	26,40	536052 0007	22,40	536053 0007	22,20	536056 0007	47,30	075017 D010	14,-
1.006	536050 0008	26,40	536052 0008	22,40	536053 0008	22,20	536056 0008	47,30	075017 D010	14,-
1.007	536050 0009	26,40	536052 0009	22,40	536053 0009	22,20	536056 0009	47,30	075017 D010	14,-
1.008	536050 0010	26,40	536052 0010	22,40	536053 0010	22,20	536056 0010	47,30	075017 D010	14,-
1.009	536050 0011	26,40	536052 0011	22,40	536053 0011	22,20	536056 0011	47,30	075017 D010	14,-
1.01	536050 0012	26,40	536052 0012	22,40	536053 0012	22,20	536056 0012	46,-	075017 D010	14,-
1.02	536050 0013	26,40	536052 0013	22,40	536053 0013	22,20	536056 0013	46,-	075017 D010	14,-
1.03	536050 0014	26,40	536052 0014	22,40	536053 0014	22,20	536056 0014	46,-	075017 D010	14,-
1.04	536050 0015	26,40	536052 0015	22,40	536053 0015	22,20	536056 0015	46,-	075017 D010	14,-
1.05	536050 0016	26,40	536052 0016	22,40	536053 0016	22,20	536056 0016	46,-	075017 D010	14,-
1.06	536050 0017	26,40	536052 0017	22,40	536053 0017	22,20	536056 0017	46,-	075017 D010	14,-
1.07	536050 0018	26,40	536052 0018	22,40	536053 0018	22,20	536056 0018	46,-	075017 D010	14,-
1.08	536050 0019	26,40	536052 0019	22,40	536053 0019	22,20	536056 0019	46,-	075017 D010	14,-
1.09	536050 0020	26,40	536052 0020	22,40	536053 0020	22,20	536056 0020	46,-	075017 D010	14,-
1.10	536050 0021	26,40	536052 0021	22,40	536053 0021	22,20	536056 0021	46,-	075017 D010	14,-
1.11	536050 0022	26,40	536052 0022	22,40	536053 0022	22,20	536056 0022	46,-	075017 D010	14,-
1.12	536050 0023	26,40	536052 0023	22,40	536053 0023	22,20	536056 0023	46,-	075017 D010	14,-
1.13	536050 0024	26,40	536052 0024	22,40	536053 0024	22,20	536056 0024	46,-	075017 D010	14,-
1.14	536050 0025	26,40	536052 0025	22,40	536053 0025	22,20	536056 0025	46,-	075017 D010	14,-
1.15	536050 0026	26,40	536052 0026	22,40	536053 0026	22,20	536056 0026	46,-	075017 D010	14,-
1.16	536050 0027	26,40	536052 0027	22,40	536053 0027	22,20	536056 0027	46,-	075017 D010	14,-
1.17	536050 0028	26,40	536052 0028	22,40	536053 0028	22,20	536056 0028	46,-	075017 D010	14,-
1.18	536050 0029	26,40	536052 0029	22,40	536053 0029	22,20	536056 0029	46,-	075017 D010	14,-
1.19	536050 0030	26,40	536052 0030	22,40	536053 0030	22,20	536056 0030	46,-	075017 D010	14,-
1.20	536050 0031	26,40	536052 0031	22,40	536053 0031	22,20	536056 0031	46,-	075017 D010	14,-
1.21	536050 0032	26,40	536052 0032	22,40	536053 0032	22,20	536056 0032	46,-	075017 D010	14,-
1.22	536050 0033	26,40	536052 0033	22,40	536053 0033	22,20	536056 0033	46,-	075017 D010	14,-
1.23	536050 0034	26,40	536052 0034	22,40	536053 0034	22,20	536056 0034	46,-	075017 D010	14,-
1.24	536050 0035	26,40	536052 0035	22,40	536053 0035	22,20	536056 0035	46,-	075017 D010	14,-
1.25	536050 0036	26,40	536052 0036	22,40	536053 0036	22,20	536056 0036	46,-	075017 D010	14,-
1.26	536050 0037	26,40	536052 0037	22,40	536053 0037	22,20	536056 0037	46,-	075017 D010	14,-
1.27	536050 0038	26,40	536052 0038	22,40	536053 0038	22,20	536056 0038	46,-	075017 D010	14,-
1.28	536050 0039	26,40	536052 0039	22,40	536053 0039	22,20	536056 0039	46,-	075017 D010	14,-
1.29	536050 0040	26,40	536052 0040	22,40	536053 0040	22,20	536056 0040	46,-	075017 D010	14,-
1.30	536050 0041	26,40	536052 0041	22,40	536053 0041	22,20	536056 0041	46,-	075017 D010	14,-
1.31	536050 0042	26,40	536052 0042	22,40	536053 0042	22,20	536056 0042	46,-	075017 D010	14,-
1.32	536050 0043	26,40	536052 0043	22,40	536053 0043	22,20	536056 0043	46,-	075017 D010	14,-
1.33	536050 0044	26,40	536052 0044	22,40	536053 0044	22,20	536056 0044	46,-	075017 D010	14,-
1.34	536050 0045	26,40	536052 0045	22,40	536053 0045	22,20	536056 0045	46,-	075017 D010	14,-
1.35	536050 0046	26,40	536052 0046	22,40	536053 0046	22,20	536056 0046	46,-	075017 D010	14,-
	5102		5102		5129		5129			



536050 0115





Nominal dimension mm	Mitutoyo		Mitutoyo		SARA®		SARA®		DAkkS calibration	
	Steel, accuracy 0 art.no.	€	Steel, accuracy 1 art.no.	€	Steel, accuracy 1 art.no.	€	Ceramics, accuracy 0 art.no.	€	art.no.	€
1.36	536050 0047	26,40	536052 0047	22,40	536053 0047	22,20	536056 0047	46,-	075017 D010	14,-
1.37	536050 0048	26,40	536052 0048	22,40	536053 0048	22,20	536056 0048	46,-	075017 D010	14,-
1.38	536050 0049	26,40	536052 0049	22,40	536053 0049	22,20	536056 0049	46,-	075017 D010	14,-
1.39	536050 0050	26,40	536052 0050	22,40	536053 0050	22,20	536056 0050	46,-	075017 D010	14,-
1.40	536050 0051	26,40	536052 0051	22,40	536053 0051	22,20	536056 0051	46,-	075017 D010	14,-
1.41	536050 0052	26,40	536052 0052	22,40	536053 0052	22,20	536056 0052	46,-	075017 D010	14,-
1.42	536050 0053	26,40	536052 0053	22,40	536053 0053	22,20	536056 0053	46,-	075017 D010	14,-
1.43	536050 0054	26,40	536052 0054	22,40	536053 0054	22,20	536056 0054	46,-	075017 D010	14,-
1.44	536050 0055	26,40	536052 0055	22,40	536053 0055	22,20	536056 0055	46,-	075017 D010	14,-
1.45	536050 0056	26,40	536052 0056	22,40	536053 0056	22,20	536056 0056	46,-	075017 D010	14,-
1.46	536050 0057	26,40	536052 0057	22,40	536053 0057	22,20	536056 0057	46,-	075017 D010	14,-
1.47	536050 0058	26,40	536052 0058	22,40	536053 0058	22,20	536056 0058	46,-	075017 D010	14,-
1.48	536050 0059	26,40	536052 0059	22,40	536053 0059	22,20	536056 0059	46,-	075017 D010	14,-
1.49	536050 0060	26,40	536052 0060	22,40	536053 0060	22,20	536056 0060	46,-	075017 D010	14,-
1.5	536050 0061	26,60	536052 0061	22,30	536053 0061	22,20	536056 0061	46,-	075017 D010	14,-
1.6	536050 0062	26,60	536052 0062	22,30	536053 0062	22,20	536056 0062	46,-	075017 D010	14,-
1.7	536050 0063	26,60	536052 0063	22,30	536053 0063	22,20	536056 0063	46,-	075017 D010	14,-
1.8	536050 0064	26,60	536052 0064	22,30	536053 0064	22,20	536056 0064	46,-	075017 D010	14,-
1.9	536050 0065	26,60	536052 0065	22,30	536053 0065	22,20	536056 0065	46,-	075017 D010	14,-
2	536050 0066	26,60	536052 0066	22,30	536053 0066	22,70	536056 0066	46,-	075017 D010	14,-
2.5	536050 0067	28,50	536052 0067	23,70	536053 0067	22,70	536056 0067	46,-	075017 D010	14,-
3	536050 0068	28,50	536052 0068	23,70	536053 0068	22,70	536056 0068	46,-	075017 D010	14,-
3.5	536050 0069	29,-	536052 0069	24,20	536053 0069	22,70	536056 0069	46,-	075017 D010	14,-
4	536050 0070	29,-	536052 0070	24,20	536053 0070	22,70	536056 0070	46,-	075017 D010	14,-
4.5	536050 0071	29,-	536052 0071	24,20	536053 0071	22,70	536056 0071	46,-	075017 D010	14,-
5	536050 0072	29,-	536052 0072	24,20	536053 0072	22,70	536056 0072	46,-	075017 D010	14,-
5.5	536050 0073	34,80	536052 0073	29,20	536053 0073	22,70	536056 0073	50,10	075017 D010	14,-
6	536050 0074	35,60	536052 0074	29,60	536053 0074	22,70	536056 0074	50,10	075017 D010	14,-
6.5	536050 0075	35,60	536052 0075	29,60	536053 0075	22,70	536056 0075	50,10	075017 D010	14,-
7	536050 0076	35,60	536052 0076	29,60	536053 0076	22,70	536056 0076	50,10	075017 D010	14,-
7.5	536050 0077	36,40	536052 0077	30,30	536053 0077	22,70	536056 0077	50,10	075017 D010	14,-
8	536050 0078	36,40	536052 0078	30,30	536053 0078	22,70	536056 0078	50,10	075017 D010	14,-
8.5	536050 0079	36,40	536052 0079	30,30	536053 0079	22,70	536056 0079	50,10	075017 D010	14,-
9	536050 0080	37,-	536052 0080	30,90	536053 0080	22,70	536056 0080	50,10	075017 D010	14,-
9.5	536050 0081	37,-	536052 0081	30,90	536053 0081	22,70	536056 0081	50,10	075017 D010	14,-
10	536050 0082	37,-	536052 0082	30,90	536053 0082	22,70	536056 0082	65,10	075017 D010	14,-
10.5	536050 0083	37,50	536052 0083	31,40	536053 0083	28,30	536056 0083	65,10	075017 D010	14,-
11	536050 0084	43,60	536052 0084	36,40	536053 0084	28,30	536056 0084	65,10	075017 D010	14,-
11.5	536050 0085	44,20	536052 0085	36,80	536053 0085	28,30	536056 0085	65,10	075017 D010	14,-
12	536050 0086	44,20	536052 0086	36,80	536053 0086	28,30	536056 0086	65,10	075017 D010	14,-
12.5	536050 0087	44,80	536052 0087	37,30	536053 0087	28,30	536056 0087	65,10	075017 D010	14,-
13	536050 0088	44,80	536052 0088	37,30	536053 0088	28,30	536056 0088	65,10	075017 D010	14,-
13.5	536050 0089	44,80	536052 0089	37,30	536053 0089	28,30	536056 0089	65,10	075017 D010	14,-
14	536050 0090	45,20	536052 0090	37,80	536053 0090	28,30	536056 0090	65,10	075017 D010	14,-
14.5	536050 0091	45,20	536052 0091	37,80	536053 0091	28,30	536056 0091	65,10	075017 D010	14,-
15	536050 0092	45,20	536052 0092	37,80	536053 0092	28,30	536056 0092	65,10	075017 D010	14,-
15.5	536050 0093	46,-	536052 0093	38,30	536053 0093	28,30	536056 0093	85,50	075017 D010	14,-
16	536050 0094	47,20	536052 0094	39,40	536053 0094	28,30	536056 0094	85,50	075017 D010	14,-
16.5	536050 0095	47,90	536052 0095	39,90	536053 0095	28,30	536056 0095	85,50	075017 D010	14,-
17	536050 0096	47,90	536052 0096	39,90	536053 0096	28,30	536056 0096	85,50	075017 D010	14,-
17.5	536050 0097	48,20	536052 0097	40,40	536053 0097	28,30	536056 0097	85,50	075017 D010	14,-
18	536050 0098	48,20	536052 0098	40,40	536053 0098	28,30	536056 0098	85,50	075017 D010	14,-
18.5	536050 0099	48,20	536052 0099	40,40	536053 0099	28,30	536056 0099	85,50	075017 D010	14,-
19	536050 0100	48,80	536052 0100	40,70	536053 0100	28,30	536056 0100	85,50	075017 D010	14,-
19.5	536050 0101	48,80	536052 0101	40,70	536053 0101	28,30	536056 0101	85,50	075017 D010	14,-
20	536050 0102	48,80	536052 0102	40,70	536053 0102	28,30	536056 0102	85,50	075017 D010	14,-
20.5	536050 0103	49,50	536052 0103	41,20	536053 0103	28,30	536056 0103	116,-	075017 D010	14,-
21	536050 0104	51,40	536052 0104	42,90	536053 0104	28,30	536056 0104	116,-	075017 D010	14,-
21.5	536050 0105	51,40	536052 0105	42,90	536053 0105	28,30	536056 0105	116,-	075017 D010	14,-
22	536050 0106	51,90	536052 0106	43,40	536053 0106	28,30	536056 0106	116,-	075017 D010	14,-

5102

5102

5129

5129



Nominal dimension mm	Mitutoyo		Mitutoyo		SARA®		SARA®		DAkkS calibration	
	Steel, accuracy 0 art.no.	€	Steel, accuracy 1 art.no.	€	Steel, accuracy 1 art.no.	€	Ceramics, accuracy 0 art.no.	€	art.no.	€
22.5	536050 0107	51,90	536052 0107	43,40	536053 0107	28,30	536056 0107	116,-	075017 D010	14,-
23	536050 0108	51,90	536052 0108	43,40	536053 0108	28,30	536056 0108	116,-	075017 D010	14,-
23.5	536050 0109	51,90	536052 0109	43,40	536053 0109	28,30	536056 0109	116,-	075017 D010	14,-
24	536050 0110	51,90	536052 0110	43,40	536053 0110	28,30	536056 0110	116,-	075017 D010	14,-
24.5	536050 0111	52,50	536052 0111	43,90	536053 0111	28,30	536056 0111	116,-	075017 D010	14,-
25	536050 0112	52,50	536052 0112	43,90	536053 0112	28,30	536056 0112	116,-	075017 D010	14,-
30	536050 0113	59,60	536052 0113	49,80	536053 0113	28,30	536056 0113	143,50	075017 D010	14,-
40	536050 0114	65,80	536052 0114	55,10	536053 0114	28,30	536056 0114	162,-	075017 D010	14,-
50	536050 0115	74,40	536052 0115	62,10	536053 0115	28,30	536056 0115	173,-	075017 D010	14,-
60	536050 0116	85,80	536052 0116	71,60	536053 0116	37,30	536056 0116	209,-	075017 D010	14,-
70	536050 0117	94,-	536052 0117	78,30	536053 0117	37,30	536056 0117	219,-	075017 D010	14,-
75	536050 0118	96,-	536052 0118	80,20	536053 0118	37,30	536056 0118	219,-	075017 D010	14,-
80	536050 0119	104,-	536052 0119	86,60	536053 0119	37,30	536056 0119	255,-	075017 D010	14,-
90	536050 0120	109,-	536052 0120	90,30	536053 0120	37,30	536056 0120	295,-	075017 D010	14,-
100	536050 0121	115,-	536052 0121	95,70	536053 0121	39,50	536056 0121	336,-	075017 D010	14,-
	5102		5102		5129		5129			

Long



Nominal dimension mm	Steel, accuracy 1 art.no.	€	DAkkS calibration art.no.	€	Factory calibration art.no.	€
41.3	536053 0413	53,10	075017 D011	22,-		
125	536053 0125	100,50	075017 D001	59,-		
131.4	536053 1314	148,-	075017 D001	59,-		
150	536053 0150	140,-	075017 D001	59,-		
175	536053 0175	153,-	075017 D001	59,-		
200	536053 0200	175,-	075017 D001	59,-		
243.5	536053 2435	325,-	075017 D002	64,-		
250	536053 0250	203,-	075017 D002	64,-		
281.2	536053 2812	355,-	075017 D002	64,-		
300	536053 0300	233,-	075017 D002	64,-		
400	536053 0400	355,-	075017 D003	79,-		
500	536053 0500	440,-	075017 D004	94,-		
600	536053 0600	819,-	075017 D006	168,-		
700	536053 0700	919,-	075017 D007	168,-		
800	536053 0800	969,-	075017 D008	168,-		
900	536053 0900	1.179,-	075017 D009	168,-		
1000	536053 1000	1.399,-			073103 W145	94,-
		5129				



Application example with gauge block connector

**SARA® Gauge block set for monitoring testing equipment**



- Made from steel
- For monitoring test equipment
- **Tolerance class 1**

**For testing outside micrometers of up to 100 mm**

- Test equipment directive VDI/VDE/DGQ 2618, Part 10.1
- Steel gauge blocks for external measurements
- Supplied in a wooden case with individually labelled compartments

for measurement range mm	Individual dimensions	art.no.	€	DAkkS calibration art.no.	€
0 - 25	5.1 / 10.3 / 15 / 20.2 / 25	535010 0005	173,-	075012 D005	84,-
0 - 100	5.1 / 10.3 / 15 / 20.2 / 25 / 50 / 75 / 100	535010 0008	275,-	075012 D008	114,-
0 - 25	2.5 / 5.1 / 7.7 / 10.3 / 12.9 / 15 / 17.6 / 20.2 / 22.8 / 25	535010 1010	295,-	075012 D010	134,-

5129

**For testing sliding callipers of up to 300 mm**

- Test equipment directive VDI/VDE/DGQ 2618, Part 9.1
- Steel gauge blocks for external measurements
- Ring gauges for internal measurements
- Supplied in a wooden case with individually labelled compartments

Individual dimensions	Ring gauges mm	for measurement ranges up to mm	art.no.	€	DAkkS calibration art.no.	€
30.0 / 41.3 / 131.4	Ø 4 / 25	200	535011 0105	425,-	075018 D001	181,-
41.3 / 131.4 / 243.5	Ø 4 / 25	300	535011 0205	519,-	075018 D002	188,-

5129



535010 1010

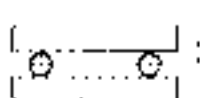


535011 0105

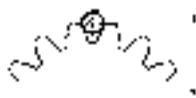
## ATORN® Precision test pin sets



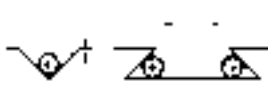
- For directly measuring bore tolerances, measuring distances between two bores, testing the eccentricity of bushes, testing angles and profiles
- Setting masters for length measurement devices, also for checking bore positions
- For parallelism tests, thread and toothing tests
- Gauge steel hardened to 58 - 62 HRC, single-aged, ground and lapped
- Ø tolerance: <br>Degree of accuracy 1 = ± 0.001 mm <br>Degree of accuracy 2 = ± 0.002 mm
- Total length: Ø 0.30 - 0.99 = 40 mm / Ø 1.00 - 20.0 = 70 mm
- From Ø 1.50 mm, marked with dimensions
- Wooden box with drilled and labelled inserts
- Other set configurations available on request



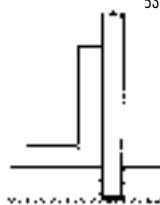
Are two levels parallel to one another?



Gear, thread, rack measurement



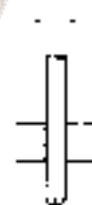
Angle and profile inspections



What is the position of the bore?



Monitoring the spacing tolerances of two bores



Direct measurement of bore tolerances

### Accuracy 1

Number	Ø mm	Pitch metr. mm	art.no.	€	DAkkS calibration art.no.	€
101	1.00 - 2.00	0.01	538001 0100	1.099,-	073103 D088	404,-
100	2.01 - 3.00	0.01	538001 0201	1.089,-	073103 D087	400,-
100	3.01 - 4.00	0.01	538001 0301	1.349,-	073103 D087	400,-
100	4.01 - 5.00	0.01	538001 0401	1.349,-	073103 D087	400,-
100	5.01 - 6.00	0.01	538001 0501	1.349,-	073103 D087	400,-
100	6.01 - 7.00	0.01	538001 0601	1.659,-	073103 D087	400,-
100	7.01 - 8.00	0.01	538001 0701	1.659,-	073103 D087	400,-
100	8.01 - 9.00	0.01	538001 0801	1.659,-	073103 D087	400,-
100	9.01 - 10.00	0.01	538001 0901	1.659,-	073103 D087	400,-
81	1.00 - 5.00	0.05	538001 1081	999,-	073103 D091	324,-
100	5.05 - 10.00	0.05	538001 1100	1.559,-	073103 D087	400,-
41	1.00 - 5.00	0.1	538001 0041	569,-	073103 D089	164,-
50	5.10 - 10.00	0.1	538001 0050	839,-	073103 D090	200,-
91	1.00 - 10.00	0.1	538001 0091	1.229,-	073103 D092	364,-

5131

### Accuracy 2

Number	Ø mm	Pitch metr. mm	art.no.	€	DAkkS calibration art.no.	€
101	1.00 - 2.00	0.01	538005 0100	859,-	073103 D094	404,-
100	2.01 - 3.00	0.01	538005 0201	859,-	073103 D093	400,-
100	3.01 - 4.00	0.01	538005 0301	1.089,-	073103 D093	400,-
100	4.01 - 5.00	0.01	538005 0401	1.089,-	073103 D093	400,-
100	5.01 - 6.00	0.01	538005 0501	1.089,-	073103 D093	400,-
100	6.01 - 7.00	0.01	538005 0601	1.269,-	073103 D093	400,-
100	7.01 - 8.00	0.01	538005 0701	1.279,-	073103 D093	400,-
100	8.01 - 9.00	0.01	538005 0801	1.279,-	073103 D093	400,-
100	9.01 - 10.00	0.01	538005 0901	1.289,-	073103 D093	400,-
81	1.00 - 5.00	0.05	538005 1081	799,-	073103 D098	324,-
100	5.05 - 10.00	0.05	538005 1100	1.209,-	073103 D093	400,-
41	1.00 - 5.00	0.1	538005 0041	430,-	073103 D096	164,-
50	5.10 - 10.00	0.1	538005 0050	649,-	073103 D097	200,-
91	1.00 - 10.00	0.1	538005 0091	919,-	073103 D099	364,-

5131

## Precision test pins, individual



- Description and use as outlined above
- From Ø 0.30 to 0.99 mm without bevel
- From Ø 1.00 to 20.00 mm with single bevel
- Stainless steel test pin or magnetic test pin available on request

Please specify nominal Ø dimension in mm to four digits

### Examples:

- Test pin, Ø 0.53 mm, accuracy 1 = order no. 538020 0053
- Test pin, Ø 16.78 mm, accuracy 2 = order no. 538025 1678

### Accuracy 1

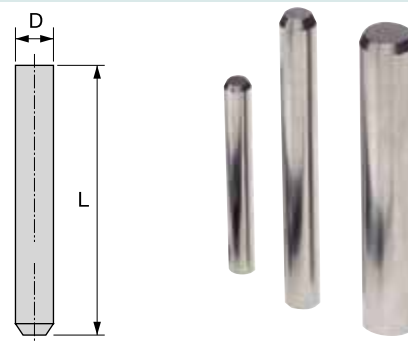
D mm	Pitch metr. mm	L mm	538020.... €	DAkkS calibration art.no.	€
0.30 - 0.49	0.01	40	29,30	074011 D001	12,-
0.50 - 0.99	0.01	40	15,40	074011 D001	12,-
1.00 - 2.99	0.01	70	13,20	074011 D001	12,-
3.00 - 5.99	0.01	70	16,50	074011 D002	9,-
6.00 - 9.99	0.01	70	21,80	074011 D002	9,-
10.00 - 11.99	0.01	70	29,30	074011 D002	9,-
12.00 - 13.99	0.01	70	35,60	074011 D003	11,-
14.00 - 15.99	0.01	70	47,-	074011 D003	11,-
16.00 - 18.99	0.01	70	58,90	074011 D003	11,-
19.00 - 20.00	0.01	70	69,60	074011 D003	11,-

5131

### Accuracy 2

D mm	Pitch metr. mm	L mm	538025.... €	DAkkS calibration art.no.	€
0.30 - 0.49	0.01	40	29,10	074011 D001	12,-
0.50 - 0.99	0.01	40	13,55	074011 D001	12,-
1.00 - 2.99	0.01	70	10,75	074011 D001	12,-
3.00 - 5.99	0.01	70	14,65	074011 D002	9,-
6.00 - 9.99	0.01	70	18,05	074011 D002	9,-
10.00 - 11.99	0.01	70	23,60	074011 D002	9,-
12.00 - 13.99	0.01	70	28,60	074011 D003	11,-
14.00 - 15.99	0.01	70	36,20	074011 D003	11,-
16.00 - 18.99	0.01	70	42,60	074011 D003	11,-
19.00 - 20.00	0.01	70	49,20	074011 D003	11,-

5131



## Test pin holder

- Holding fixture for two test pins within a tolerance zone (e.g. go and no-go dimensions)
- Test pins easier to handle, particularly with small diameters



for test pins Ø mm	L mm	art.no.	€
1.00 to 1.99	59	<b>538050 0002</b>	<b>11,45</b>
2.00 to 4.50	67	538050 0004	13,05
4.51 to 6.99	75	538050 0006	23,50
7.00 to 9.50	83	538050 0008	31,-
9.51 to 12.00	91	538050 0010	34,30

5131

## SARA® Limit plug gauges

**DIN 7150/2** **DIN EN ISO 1938-1** **DIN 7164**

- Go/no-go bore testing
- Tolerances and deviations in accordance with DIN EN ISO 1938-1 and DIN 7164
- Go ends for limit plug gauges are supplied with additional wear allowances in accordance with DIN EN ISO 1938-1
- Test pieces ground and lapped
- Up to Ø 70 mm = go/no-go ends on a single handle; 2-part version above Ø 70 mm
- Material: 540101.... to 540115....: Go/no-go made from wear-resistant gauge steel, hardened and aged  
540120....: Go end hard chrome-plated, no-go end gauge steel
- Intermediate dimensions, other tolerance classes, numerical tolerances, carbide limit plug gauges or flat limit hole gauges are available on request!



540101 0020

### Tolerance class H7

Nominal Ø mm	Steel H7		Hard chrome, H7		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
2	540101 0002	24,20	540120 0002	89,-	075036 D001	24,-
3	540101 0003	22,-	540120 0003	77,10	075036 D001	24,-
4	540101 0004	19,85	540120 0004	69,50	075036 D001	24,-
5	540101 0005	17,10	540120 0005	65,-	075036 D001	24,-
6	540101 0006	17,10	540120 0006	65,-	075036 D001	24,-
7	540101 0007	17,20	540120 0007	67,30	075036 D001	24,-
8	540101 0008	17,50	540120 0008	69,50	075036 D001	24,-
9	540101 0009	18,35	540120 0009	72,30	075036 D001	24,-
10	540101 0010	18,85	540120 0010	74,90	075036 D001	24,-
11	540101 0011	19,75	540120 0011	77,10	075036 D002	30,-
12	540101 0012	20,20	540120 0012	79,60	075036 D002	30,-
13	540101 0013	20,80	540120 0013	82,-	075036 D002	30,-
14	540101 0014	21,30	540120 0014	84,30	075036 D002	30,-
15	540101 0015	21,70	540120 0015	86,50	075036 D002	30,-
16	540101 0016	22,70	540120 0016	89,-	075036 D002	30,-
17	540101 0017	23,40	540120 0017	91,30	075036 D002	30,-
18	540101 0018	24,10	540120 0018	93,70	075036 D002	30,-
19	540101 0019	25,30	540120 0019	96,60	075036 D002	30,-
20	540101 0020	25,30	540120 0020	96,60	075036 D002	30,-
21	540101 0021	25,80	540120 0021	101,50	075036 D002	30,-
22	540101 0022	26,20	540120 0022	104,-	075036 D002	30,-
23	540101 0023	26,90	540120 0023	106,50	075036 D002	30,-
24	540101 0024	27,60	540120 0024	108,50	075036 D002	30,-
25	540101 0025	28,20	540120 0025	111,-	075036 D002	30,-
26	540101 0026	28,70	540120 0026	113,-	075036 D002	30,-
27	540101 0027	29,40	540120 0027	115,50	075036 D002	30,-
28	540101 0028	29,90	540120 0028	118,50	075036 D002	30,-
30	540101 0030	32,10	540120 0030	121,50	075036 D002	30,-

5132

5132

Nominal Ø mm	Steel H7		Hard chrome, H7		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
32	540101 0032	37,40	540120 0032	130,50	075036 D002	30,-
34	540101 0034	39,60	540120 0034	137,-	075036 D002	30,-
35	540101 0035	40,-	540120 0035	140,-	075036 D002	30,-
36	540101 0036	40,70	540120 0036	142,-	075036 D002	30,-
37	540101 0037	41,20	540120 0037	144,50	075036 D002	30,-
38	540101 0038	42,10	540120 0038	149,50	075036 D002	30,-
40	540101 0040	44,60	540120 0040	154,50	075036 D002	30,-
42	540101 0042	48,50	540120 0042	159,50	075036 D002	30,-
44	540101 0044	49,60	540120 0044	169,-	075036 D002	30,-
45	540101 0045	50,10	540120 0045	173,50	075036 D002	30,-
46	540101 0046	50,30	540120 0046	178,50	075036 D002	30,-
47	540101 0047	50,90	540120 0047	184,-	075036 D002	30,-
48	540101 0048	51,50	540120 0048	188,50	075036 D002	30,-
50	540101 0050	58,60	540120 0050	193,-	075036 D002	30,-
52	540101 0052	96,-	540120 0052	202,-	075036 D003	34,-
55	540101 0055	98,10	540120 0055	213,-	075036 D003	34,-
60	540101 0060	105,50	540120 0060	237,-	075036 D003	34,-
62	540101 0062	108,50	540120 0062	247,-	075036 D003	34,-
65	540101 0065	114,-	540120 0065	254,-	075036 D003	34,-
68	540101 0068	114,-	540120 0068	271,-	075036 D003	34,-
70	540101 0070	123,-	540120 0070	275,-	073103 D073	64,-
72	540101 0072	134,50	540120 0072	290,-	073103 D073	64,-
75	540101 0075	134,50	540120 0075	299,-	073103 D073	64,-
80	540101 0080	142,50	540120 0080	318,-	073103 D073	64,-
85	540101 0085	150,50	540120 0085	338,-	073103 D073	64,-
90	540101 0090	161,-	540120 0090	365,-	073103 D073	64,-
95	540101 0095	170,50	540120 0095	385,-	073103 D073	64,-
100	540101 0100	180,-	540120 0100	405,-	073103 D073	64,-

5132

5132

## Other tolerance classes

Nominal Ø mm	Steel, H6		Steel, H8		Steel, H9		Steel F7		Steel, K6		DkkS calibration	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
2	540103 0002	50,60	540105 0002	50,60	540107 0002	50,60	540111 0002	50,60	540115 0002	50,60	075036 D001	24,-
3	540103 0003	43,90	540105 0003	43,90	540107 0003	43,90	540111 0003	43,90	540115 0003	43,90	075036 D001	24,-
4	540103 0004	39,60	540105 0004	39,60	540107 0004	39,60	540111 0004	39,60	540115 0004	39,60	075036 D001	24,-
5	540103 0005	37,10	540105 0005	37,10	540107 0005	37,10	540111 0005	37,10	540115 0005	37,10	075036 D001	24,-
6	540103 0006	37,10	540105 0006	37,10	540107 0006	37,10	540111 0006	37,10	540115 0006	37,10	075036 D001	24,-
7	540103 0007	38,40	540105 0007	38,40	540107 0007	38,40	540111 0007	38,40	540115 0007	38,40	075036 D001	24,-
8	540103 0008	39,60	540105 0008	39,60	540107 0008	39,60	540111 0008	39,60	540115 0008	39,60	075036 D001	24,-
9	540103 0009	40,90	540105 0009	40,90	540107 0009	40,90	540111 0009	40,90	540115 0009	40,90	075036 D001	24,-
10	540103 0010	42,60	540105 0010	42,60	540107 0010	42,60	540111 0010	42,60	540115 0010	42,60	075036 D001	24,-
11	540103 0011	43,90	540105 0011	43,90	540107 0011	43,90	540111 0011	43,90	540115 0011	43,90	075036 D002	30,-
12	540103 0012	45,20	540105 0012	45,20	540107 0012	45,20	540111 0012	45,20	540115 0012	45,20	075036 D002	30,-
13	540103 0013	46,60	540105 0013	46,60	540107 0013	46,60	540111 0013	46,60	540115 0013	46,60	075036 D002	30,-
14	540103 0014	48,-	540105 0014	48,-	540107 0014	48,-	540111 0014	48,-	540115 0014	48,-	075036 D002	30,-
15	540103 0015	49,30	540105 0015	49,30	540107 0015	49,30	540111 0015	49,30	540115 0015	49,30	075036 D002	30,-
16	540103 0016	50,60	540105 0016	50,60	540107 0016	50,60	540111 0016	50,60	540115 0016	50,60	075036 D002	30,-
17	540103 0017	51,90	540105 0017	51,90	540107 0017	51,90	540111 0017	51,90	540115 0017	51,90	075036 D002	30,-
18	540103 0018	53,40	540105 0018	53,40	540107 0018	53,40	540111 0018	53,40	540115 0018	53,40	075036 D002	30,-
19	540103 0019	55,-	540105 0019	55,-	540107 0019	55,-	540111 0019	55,-	540115 0019	55,-	075036 D002	30,-
20	540103 0020	55,-	540105 0020	55,-	540107 0020	55,-	540111 0020	55,-	540115 0020	55,-	075036 D002	30,-
21	540103 0021	57,50	540105 0021	57,50	540107 0021	57,50	540111 0021	57,50	540115 0021	57,50	075036 D002	30,-
22	540103 0022	58,50	540105 0022	58,50	540107 0022	58,50	540111 0022	58,50	540115 0022	58,50	075036 D002	30,-
23	540103 0023	60,10	540105 0023	60,10	540107 0023	60,10	540111 0023	60,10	540115 0023	60,10	075036 D002	30,-
24	540103 0024	61,60	540105 0024	61,60	540107 0024	61,60	540111 0024	61,60	540115 0024	61,60	075036 D002	30,-
25	540103 0025	62,60	540105 0025	62,60	540107 0025	62,60	540111 0025	62,60	540115 0025	62,60	075036 D002	30,-
26	540103 0026	64,10	540105 0026	64,10	540107 0026	64,10	540111 0026	64,10	540115 0026	64,10	075036 D002	30,-
27	540103 0027	65,60	540105 0027	65,60	540107 0027	65,60	540111 0027	65,60	540115 0027	65,60	075036 D002	30,-
28	540103 0028	67,20	540105 0028	67,20	540107 0028	67,20	540111 0028	67,20	540115 0028	67,20	075036 D002	30,-
30	540103 0030	68,20	540105 0030	68,20	540107 0030	68,20	540111 0030	68,20	540115 0030	68,20	075036 D002	30,-
32	540103 0032	73,80	540105 0032	73,80	540107 0032	73,80	540111 0032	73,80	540115 0032	73,80	075036 D002	30,-
34	540103 0034	78,40	540105 0034	78,40	540107 0034	78,40	540111 0034	78,40	540115 0034	78,40	075036 D002	30,-
35	540103 0035	79,90	540105 0035	79,90	540107 0035	79,90	540111 0035	79,90	540115 0035	79,90	075036 D002	30,-
36	540103 0036	80,90	540105 0036	80,90	540107 0036	80,90	540111 0036	80,90	540115 0036	80,90	075036 D002	30,-
37	540103 0037	82,40	540105 0037	82,40	540107 0037	82,40	540111 0037	82,40	540115 0037	82,40	075036 D002	30,-
38	540103 0038	85,-	540105 0038	85,-	540107 0038	85,-	540111 0038	85,-	540115 0038	85,-	075036 D002	30,-
40	540103 0040	87,50	540105 0040	87,50	540107 0040	87,50	540111 0040	87,50	540115 0040	87,50	075036 D002	30,-
42	540103 0042	90,60	540105 0042	90,60	540107 0042	90,60	540111 0042	90,60	540115 0042	90,60	075036 D002	30,-
44	540103 0044	95,60	540105 0044	95,60	540107 0044	95,60	540111 0044	95,60	540115 0044	95,60	075036 D002	30,-
45	540103 0045	98,20	540105 0045	98,20	540107 0045	98,20	540111 0045	98,20	540115 0045	98,20	075036 D002	30,-
46	540103 0046	101,50	540105 0046	101,50	540107 0046	101,50	540111 0046	101,50	540115 0046	101,50	075036 D002	30,-
47	540103 0047	104,-	540105 0047	104,-	540107 0047	104,-	540111 0047	104,-	540115 0047	104,-	075036 D002	30,-
48	540103 0048	107,-	540105 0048	107,-	540107 0048	107,-	540111 0048	107,-	540115 0048	107,-	075036 D002	30,-
50	540103 0050	109,-	540105 0050	109,-	540107 0050	109,-	540111 0050	109,-	540115 0050	109,-	075036 D002	30,-
52	540103 0052	115,-	540105 0052	115,-	540107 0052	115,-	540111 0052	115,-	540115 0052	115,-	075036 D003	34,-
55	540103 0055	120,50	540105 0055	120,50	540107 0055	120,50	540111 0055	120,50	540115 0055	120,50	075036 D003	34,-
60	540103 0060	133,50	540105 0060	133,50	540107 0060	133,50	540111 0060	133,50	540115 0060	133,50	075036 D003	34,-
62	540103 0062	139,50	540105 0062	139,50	540107 0062	139,50	540111 0062	139,50	540115 0062	139,50	075036 D003	34,-
65	540103 0065	143,50	540105 0065	143,50	540107 0065	143,50	540111 0065	143,50	540115 0065	143,50	075036 D003	34,-
68	540103 0068	153,-	540105 0068	153,-	540107 0068	153,-	540111 0068	153,-	540115 0068	153,-	075036 D003	34,-
70	540103 0070	157,-	540105 0070	157,-	540107 0070	157,-	540111 0070	157,-	540115 0070	157,-	073103 D073	64,-
72	540103 0072	163,-	540105 0072	163,-	540107 0072	163,-	540111 0072	163,-	540115 0072	163,-	073103 D073	64,-
75	540103 0075	170,-	540105 0075	170,-	540107 0075	170,-	540111 0075	170,-	540115 0075	170,-	073103 D073	64,-
80	540103 0080	181,50	540105 0080	181,50	540107 0080	181,50	540111 0080	181,50	540115 0080	181,50	073103 D073	64,-
85	540103 0085	191,50	540105 0085	191,50	540107 0085	191,50	540111 0085	191,50	540115 0085	191,50	073103 D073	64,-
90	540103 0090	204,-	540105 0090	204,-	540107 0090	204,-	540111 0090	204,-	540115 0090	204,-	073103 D073	64,-
95	540103 0095	214,-	540105 0095	214,-	540107 0095	214,-	540111 0095	214,-	540115 0095	214,-	073103 D073	64,-
100	540103 0100	229,-	540105 0100	229,-	540107 0100	229,-	540111 0100	229,-	540115 0100	229,-	073103 D073	64,-
	5198		5198		5198		5198		5198			





## SARA® Limit plug gauge set



- Tolerance class H7
- 1 of each limit plug gauge: 3, 4, 5, 6, 8, 10, 12 mm

Description	art.no.		€		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
Limit plug gauge set	540101	1000	142,-		073103	D072 174,-

5132



## SARA® Limit gap gauge



- For go/no-go shaft testing
- **double-ended**
- Tolerances and deviations in accordance with DIN EN ISO 1938-1 and DIN 7163,
- Go ends of the limit gap gauges are manufactured with additional wear allowances in accordance with DIN EN ISO 1938-1
- Wear-resistant gauge steel, forged blank
- Aged and hardened, test faces ground and lapped
- **ISO tolerance class: h6**

- Intermediate dimensions, other tolerance classes - including numerical tolerances - and other versions, e.g. hard chrome-plated or carbide measuring faces and single-sided limit gap gauges, are available on request
- If required, all round-fit, taper and thread gauges can be supplied with a calibration certificate in accordance with VDI/VDE/DGQ 2618 guidelines



540130 0022

Nominal Ø mm	art.no.		€		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
6	540130 0006	122,-	075693 D001	22,-		
7	540130 0007	109,50	075693 D001	22,-		
8	540130 0008	109,50	075693 D001	22,-		
9	540130 0009	109,50	075693 D001	22,-		
10	540130 0010	109,50	075693 D001	22,-		
11	540130 0011	117,-	075693 D001	22,-		
12	540130 0012	117,-	075693 D001	22,-		
13	540130 0013	117,-	075693 D001	22,-		
14	540130 0014	117,-	075693 D001	22,-		
15	540130 0015	125,50	075693 D001	22,-		
16	540130 0016	125,50	075693 D001	22,-		
17	540130 0017	125,50	075693 D001	22,-		
18	540130 0018	125,50	075693 D001	22,-		
19	540130 0019	136,-	075693 D001	22,-		
20	540130 0020	136,-	075693 D001	22,-		
21	540130 0021	136,-	075693 D001	22,-		
22	540130 0022	136,-	075693 D001	22,-		
23	540130 0023	138,50	075693 D001	22,-		
24	540130 0024	138,50	075693 D001	22,-		
25	540130 0025	138,50	075693 D001	22,-		
26	540130 0026	138,50	075693 D001	22,-		
27	540130 0027	138,50	075693 D001	22,-		
28	540130 0028	140,-	075693 D001	22,-		
30	540130 0030	140,-	075693 D001	22,-		
32	540130 0032	140,-	075693 D001	22,-		
33	540130 0033	146,50	075693 D001	22,-		
34	540130 0034	146,50	075693 D001	22,-		
35	540130 0035	146,50	075693 D001	22,-		
36	540130 0036	146,50	075693 D001	22,-		
37	540130 0037	146,50	075693 D001	22,-		

5134

Nominal Ø mm	art.no.		€		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
38	540130 0038	146,50	075693 D001	22,-		
40	540130 0040	155,-	075693 D001	22,-		
42	540130 0042	155,-	075693 D001	22,-		
44	540130 0044	167,-	075693 D001	22,-		
45	540130 0045	167,-	075693 D001	22,-		
46	540130 0046	167,-	075693 D001	22,-		
47	540130 0047	167,-	075693 D001	22,-		
48	540130 0048	167,-	075693 D001	22,-		
50	540130 0050	177,-	075693 D001	22,-		
52	540130 0052	177,-	075693 D002	25,-		
55	540130 0055	177,-	075693 D002	25,-		
58	540130 0058	191,50	075693 D002	25,-		
60	540130 0060	191,50	075693 D002	25,-		
62	540130 0062	191,50	075693 D002	25,-		
65	540130 0065	211,-	075693 D002	25,-		
68	540130 0068	211,-	075693 D002	25,-		
70	540130 0070	211,-	075693 D002	25,-		
72	540130 0072	227,-	075693 D002	25,-		
75	540130 0075	227,-	075693 D002	25,-		
78	540130 0078	250,-	075693 D002	25,-		
80	540130 0080	250,-	075693 D002	25,-		
82	540130 0082	250,-	075693 D002	25,-		
85	540130 0085	257,-	075693 D002	25,-		
88	540130 0088	257,-	075693 D002	25,-		
90	540130 0090	257,-	075693 D002	25,-		
92	540130 0092	257,-	075693 D002	25,-		
95	540130 0095	269,-	075693 D002	25,-		
98	540130 0098	269,-	075693 D002	25,-		
100	540130 0100	269,-	075693 D002	25,-		

5134



**SARA® Ring gauge****DIN 2250C**

- For setting and testing measuring instruments
- Wear-resistant gauge steel, aged and hardened, ground with lapped bore
- Labelled with actual dimension to three decimal places
- If ordering with calibration (...K), please specify if normal testing with shape deviation or simplified testing (diameter only) is required



540135 0055

Nominal Ø mm	art.no.	€	DAkkS calibration	
			art.no.	€
4	540135 0004	58,30	075635 D003	36,-
5	540135 0005	55,20	075635 D003	36,-
6	540135 0006	47,10	075635 D003	36,-
7	540135 0007	47,10	075635 D003	36,-
8	540135 0008	47,10	075635 D003	36,-
9	540135 0009	47,10	075635 D003	36,-
10	540135 0010	47,10	075635 D003	36,-
11	540135 0011	48,10	075635 D003	36,-
12	540135 0012	48,10	075635 D003	36,-
13	540135 0013	48,10	075635 D003	36,-
14	540135 0014	48,10	075635 D003	36,-
15	540135 0015	48,10	075635 D003	36,-
16	540135 0016	49,60	075635 D003	36,-
17	540135 0017	49,60	075635 D003	36,-
18	540135 0018	49,60	075635 D003	36,-
19	540135 0019	49,60	075635 D003	36,-
20	540135 0020	49,60	075635 D003	36,-
21	540135 0021	54,40	075635 D003	36,-
22	540135 0022	54,40	075635 D003	36,-
23	540135 0023	54,40	075635 D003	36,-
24	540135 0024	54,40	075635 D003	36,-
25	540135 0025	54,40	075635 D003	36,-
26	540135 0026	54,40	075635 D003	36,-
27	540135 0027	54,80	075635 D003	36,-
28	540135 0028	55,40	075635 D003	36,-
30	540135 0030	57,10	075635 D003	36,-
32	540135 0032	57,10	075635 D003	36,-
33	540135 0033	59,50	075635 D003	36,-
34	540135 0034	59,50	075635 D003	36,-
35	540135 0035	59,50	075635 D003	36,-
36	540135 0036	61,60	075635 D003	36,-
37	540135 0037	63,30	075635 D003	36,-

5135

Nominal Ø mm	art.no.	€	DAkkS calibration	
			art.no.	€
38	540135 0038	63,30	075635 D003	36,-
40	540135 0040	65,60	075635 D003	36,-
42	540135 0042	73,30	075635 D003	36,-
44	540135 0044	74,30	075635 D003	36,-
45	540135 0045	76,30	075635 D003	36,-
46	540135 0046	76,80	075635 D003	36,-
47	540135 0047	76,80	075635 D003	36,-
48	540135 0048	79,40	075635 D003	36,-
50	540135 0050	82,40	075635 D003	36,-
52	540135 0052	95,60	075635 D004	44,-
55	540135 0055	95,60	075635 D004	44,-
58	540135 0058	103,-	075635 D004	44,-
60	540135 0060	103,-	075635 D004	44,-
62	540135 0062	113,-	075635 D004	44,-
65	540135 0065	116,50	075635 D004	44,-
68	540135 0068	123,-	075635 D004	44,-
70	540135 0070	123,-	075635 D004	44,-
72	540135 0072	138,50	075635 D004	44,-
75	540135 0075	138,50	075635 D004	44,-
78	540135 0078	149,-	075635 D004	44,-
80	540135 0080	149,-	075635 D004	44,-
82	540135 0082	173,-	075635 D004	44,-
85	540135 0085	173,-	075635 D004	44,-
88	540135 0088	181,50	075635 D004	44,-
90	540135 0090	181,50	075635 D004	44,-
92	540135 0092	198,50	075635 D004	44,-
95	540135 0095	198,50	075635 D004	44,-
98	540135 0098	218,-	075635 D004	44,-
100	540135 0100	218,-	075635 D004	44,-
125	540135 0125	270,-	075635 D005	62,-
175	540135 0175	470,-	075635 D005	62,-

5135

**SARA® Morse taper gauges****DIN 229**

- Testing of conical shanks and drill holes on tools and machine tools
- Wear-resistant gauge steel, aged and hardened
- Ground, with lapped taper surfaces
- 540501.... Taper plug gauge without tang DIN 229
- 540505.... Taper sleeve gauge without tang DIN 229

**Morse taper plug gauge**

Morse taper	art.no.	€	Factory calibration	
			art.no.	€
0	540501 0000	72,80	073103 W137	36,-
1	540501 0001	76,30	073103 W137	36,-
2	540501 0002	85,50	073103 W137	36,-
3	540501 0003	102,50	073103 W137	36,-
4	540501 0004	130,-	073103 W138	36,-
5	540501 0005	190,50	073103 W138	36,-
6	540501 0006	260,-	073103 W139	36,-

5136

- The following plug gauges and gauge sleeves and/or ring gauges are available on request:

Taper gauges for steep-angle taper DIN 2079 and 2080  
Metric taper gauges according to DIN 234 and 235  
Drill chuck taper gauges according to DIN 2221 and 2222  
Serration gauges according to DIN 5481 Gauges for splined shafts and splined profile hubs according to DIN 5462, 5463, 5464, 5465, 5471, 5472 and 5641 Special-purpose gauges to your specifications

**Morse taper sleeve gauge**

Morse taper	art.no.	€	Factory calibration	
			art.no.	€
0	540505 0000	183,50	073103 W140	36,-
1	540505 0001	176,50	073103 W140	36,-
2	540505 0002	173,-	073103 W140	36,-
3	540505 0003	207,-	073103 W140	36,-
4	540505 0004	258,-	073103 W141	36,-
5	540505 0005	341,-	073103 W141	36,-
6	540505 0006	559,-	073103 W142	36,-

5136

## SARA® Thread plug gauges

DIN  
13DIN ISO  
1502

- For Go/No-Go inspection of nut threads
- The Go/No-Go side is made of wear-resistant gauge steel, aged, hardened and fine-ground
- Tolerances and dimensions in accordance with DIN ISO 1502
- Go ends for thread limit plug gauges are manufactured with additional wear allowances in accordance with DIN ISO 1502

• **Tolerance class 6H (\* = tolerance class 5H)**



### For right-hand ISO metric thread, DIN 13

Thread	art.no.	€	DAkkS calibration	
			art.no.	€
M 1	* 541001 0010	113,-	075016 D001	50,-
M 1.4	* 541001 0014	102,-	075016 D001	50,-
M 1.6	541001 0016	84,-	075016 D001	50,-
M 2	541001 0020	70,70	075016 D001	50,-
M 2.5	541001 0025	61,60	075016 D001	50,-
M 3	541001 0030	56,-	075016 D001	50,-
M 3.5	541001 0035	51,90	075016 D002	20,-
M 4	541001 0040	49,50	075016 D002	20,-
M 5	541001 0050	48,70	075016 D002	20,-
M 6	541001 0060	48,70	075016 D002	20,-
M 8	541001 0080	48,70	075016 D002	20,-
M 10	541001 0100	51,20	075016 D002	20,-
M 12	541001 0120	55,50	075016 D002	20,-
M 14	541001 0140	60,-	075016 D002	20,-
M 16	541001 0160	64,40	075016 D002	20,-

5137

Thread	art.no.	€	DAkkS calibration	
			art.no.	€
M 18	541001 0180	70,70	075016 D002	20,-
M 20	541001 0200	75,50	075016 D002	20,-
M 22	541001 0220	82,90	075016 D002	20,-
M 24	541001 0240	88,20	075016 D002	20,-
M 27	541001 0270	97,90	075016 D002	20,-
M 30	541001 0300	109,50	075016 D002	20,-
M 33	541001 0330	127,-	075016 D002	20,-
M 36	541001 0360	135,50	075016 D002	20,-
M 39	541001 0390	153,-	075016 D002	20,-
M 42	541001 0420	204,-	075016 D002	20,-
M 45	541001 0450	204,-	075016 D002	20,-
M 48	541001 0480	213,-	075016 D002	20,-
M 52	541001 0520	227,-	075016 D003	22,-
M 56	541001 0560	326,-	075016 D003	22,-
M 60	541001 0600	336,-	075016 D003	22,-

5137

### Set for right-hand ISO metric thread, DIN 13

Contents	art.no.	€	DAkkS calibration	
			art.no.	€
1 x thread limit plug gauge M 3, 4, 5, 6, 8, 10 and 12	541010 0001	370,-	073103 D071	170,-

5137



### For right-hand ISO fine-pitch metric thread, DIN 13

Thread	art.no.	€	DAkkS calibration	
			art.no.	€
M 8 x 0.5	541002 0805	103,-	075016 D002	20,-
M 8 x 0.75	541002 0807	102,-	075016 D002	20,-
M 8 x 1.0	541002 0810	56,80	075016 D002	20,-
M 9 x 1.0	541002 0910	67,70	075016 D002	20,-
M 10 x 0.75	541002 1007	67,30	075016 D002	20,-
M 10 x 1.0	541002 1010	59,70	075016 D002	20,-
M 10 x 1.25	541002 1012	66,30	075016 D002	20,-
M 11 x 1.0	541002 1110	70,70	075016 D002	20,-
M 12 x 1.0	541002 1210	65,40	075016 D002	20,-
M 12 x 1.25	541002 1212	72,80	075016 D002	20,-
M 12 x 1.5	541002 1215	59,-	075016 D002	20,-
M 14 x 1.0	541002 1410	68,90	075016 D002	20,-
M 14 x 1.25	541002 1412	76,50	075016 D002	20,-
M 14 x 1.5	541002 1415	63,10	075016 D002	20,-
M 16 x 1.0	541002 1610	73,80	075016 D002	20,-
M 16 x 1.5	541002 1615	66,30	075016 D002	20,-
M 18 x 1.0	541002 1810	76,50	075016 D002	20,-
M 18 x 1.5	541002 1815	70,40	075016 D002	20,-
M 20 x 1.0	541002 2010	82,60	075016 D002	20,-
M 20 x 1.5	541002 2015	75,30	075016 D002	20,-
M 20 x 2.0	541002 2020	86,50	075016 D002	20,-
M 22 x 1.5	541002 2215	82,90	075016 D002	20,-
M 24 x 1.0	541002 2410	97,70	075016 D002	20,-
M 24 x 1.5	541002 2415	88,50	075016 D002	20,-

5137

Thread	art.no.	€	DAkkS calibration	
			art.no.	€
M 24 x 2.0	541002 2420	88,50	075016 D002	20,-
M 25 x 1.5	541002 2515	91,10	075016 D002	20,-
M 26 x 1.5	541002 2615	94,10	075016 D002	20,-
M 27 x 1.5	541002 2715	96,70	075016 D002	20,-
M 27 x 2.0	541002 2720	96,70	075016 D002	20,-
M 28 x 1.5	541002 2815	99,70	075016 D002	20,-
M 30 x 1.0	541002 3010	122,50	075016 D002	20,-
M 30 x 1.5	541002 3015	109,50	075016 D002	20,-
M 30 x 2.0	541002 3020	109,50	075016 D002	20,-
M 32 x 1.5	541002 3215	110,50	075016 D002	20,-
M 33 x 1.5	541002 3315	113,50	075016 D002	20,-
M 33 x 2.0	541002 3320	116,-	075016 D002	20,-
M 35 x 1.5	541002 3515	120,50	075016 D002	20,-
M 36 x 1.5	541002 3615	122,50	075016 D002	20,-
M 36 x 2.0	541002 3620	127,50	075016 D002	20,-
M 38 x 1.5	541002 3815	132,50	075016 D002	20,-
M 40 x 1.5	541002 4015	140,50	075016 D002	20,-
M 40 x 2.0	541002 4020	140,50	075016 D002	20,-
M 42 x 1.5	541002 4215	145,-	075016 D002	20,-
M 42 x 2.0	541002 4220	148,50	075016 D002	20,-
M 45 x 1.5	541002 4515	151,-	075016 D002	20,-
M 45 x 2.0	541002 4520	156,-	075016 D002	20,-
M 48 x 1.5	541002 4815	159,-	075016 D002	20,-
M 48 x 2.0	541002 4820	159,-	075016 D002	20,-

5137

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M 50 x 1.5	541002 5015	161,-	075016 D002	20,-		
M 50 x 2.0	541002 5020	161,-	075016 D002	20,-		
M 52 x 1.5	541002 5215	176,-	075016 D003	22,-		
M 52 x 2.0	541002 5220	188,50	075016 D003	22,-		
M 55 x 1.5	541002 5515	181,50	075016 D003	22,-		
M 55 x 2.0	541002 5520	188,50	075016 D003	22,-		

5137

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M 56 x 1.5	541002 5615	183,50	075016 D003	22,-		
M 56 x 2.0	541002 5620	188,50	075016 D003	22,-		
M 58 x 1.5	541002 5815	188,50	075016 D003	22,-		
M 58 x 2.0	541002 5820	188,50	075016 D003	22,-		
M 60 x 1.5	541002 6015	193,50	075016 D003	22,-		
M 60 x 2.0	541002 6020	196,50	075016 D003	22,-		

5137

## SARA® Thread ring gauges

**DIN 13** **DIN ISO 1502**

- For testing bolt threads
- Wear-resistant gauge steel, aged and hardened
- Outer diameter milled
- Precision-ground thread
- Tolerances and dimensions in accordance with DIN ISO 1502
- **Tolerance class 6 g**
- **No-Go rings marked in red**
- Threaded gauges for other thread types e.g. trapezoid, pipe, BSF, UN, UNC, UNF, UNEF, NPTF, Pg, Edison screw thread and left-hand thread, as well as other dimensions and tolerance classes are available on request
- If required, all thread gauges can be supplied with a calibration certificate or DKD calibration certificate in accordance with the test equipment monitoring guidelines set out in VDI/VDE/DGQ 2618



541051 0240

541050 0240

### For right-hand metric ISO thread, DIN 13

Thread	Good		Reject		Factory calibration	
	art.no.	€	art.no.	€	art.no.	€
M 2	541050 0020	75,30	541051 0020	75,30	073103 W134	52,-

5138

5138

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M 2.5	541050 0025	60,10	541051 0025	60,10	075690 D001	36,-
M 3	541050 0030	52,50	541051 0030	52,50	075690 D001	36,-
M 3.5	541050 0035	54,80	541051 0035	54,80	075690 D002	20,-
M 4	541050 0040	48,-	541051 0040	48,-	075690 D002	20,-
M 5	541050 0050	48,-	541051 0050	48,-	075690 D002	20,-
M 6	541050 0060	48,-	541051 0060	48,-	075690 D002	20,-
M 8	541050 0080	48,90	541051 0080	48,90	075690 D002	20,-
M 10	541050 0100	56,60	541051 0100	56,60	075690 D002	20,-
M 12	541050 0120	64,40	541051 0120	64,40	075690 D002	20,-
M 14	541050 0140	68,90	541051 0140	68,90	075690 D002	20,-
M 16	541050 0160	71,20	541051 0160	71,20	075690 D002	20,-
M 18	541050 0180	80,90	541051 0180	80,90	075690 D002	20,-
M 20	541050 0200	87,50	541051 0200	87,50	075690 D002	20,-

5138

5138

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M 22	541050 0220	94,60	541051 0220	94,60	075690 D002	20,-
M 24	541050 0240	102,50	541051 0240	102,50	075690 D002	20,-
M 27	541050 0270	113,-	541051 0270	113,-	075690 D002	20,-
M 30	541050 0300	127,-	541051 0300	127,-	075690 D002	20,-
M 33	541050 0330	137,50	541051 0330	137,50	075690 D002	20,-
M 36	541050 0360	160,50	541051 0360	160,50	075690 D002	20,-
M 39	541050 0390	178,50	541051 0390	178,50	075690 D002	20,-
M 42	541050 0420	187,50	541051 0420	187,50	075690 D002	20,-
M 45	541050 0450	207,-	541051 0450	207,-	075690 D002	20,-
M 48	541050 0480	212,-	541051 0480	212,-	075690 D002	20,-
M 52	541050 0520	254,-	541051 0520	254,-	075690 D003	22,-
M 56	541050 0560	265,-	541051 0560	265,-	075690 D003	22,-
M 60	541050 0600	270,-	541051 0600	270,-	075690 D003	22,-

5138

5138

### For right-hand ISO fine-pitch metric thread, DIN 13

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M 8 x 0.5	541052 0805	86,-	541053 0805	86,-	075690 D002	20,-
M 8 x 0.75	541052 0807	60,60	541053 0807	60,60	075690 D002	20,-
M 8 x 1.0	541052 0810	56,-	541053 0810	56,-	075690 D002	20,-
M 9 x 1.0	541052 0910	76,80	541053 0910	76,80	075690 D002	20,-
M 10 x 0.75	541052 1007	73,80	541053 1007	73,80	075690 D002	20,-
M 10 x 1.0	541052 1010	60,60	541053 1010	60,60	075690 D002	20,-
M 10 x 1.25	541052 1012	76,30	541053 1012	76,30	075690 D002	20,-
M 11 x 1.0	541052 1110	76,80	541053 1110	76,80	075690 D002	20,-
M 12 x 1.0	541052 1210	68,90	541053 1210	68,90	075690 D002	20,-
M 12 x 1.25	541052 1212	89,50	541053 1212	89,50	075690 D002	20,-
M 12 x 1.5	541052 1215	64,60	541053 1215	64,60	075690 D002	20,-
M 14 x 1.0	541052 1410	75,30	541053 1410	75,30	075690 D002	20,-
M 14 x 1.25	541052 1412	82,40	541053 1412	82,40	075690 D002	20,-
M 14 x 1.5	541052 1415	68,70	541053 1415	68,70	075690 D002	20,-

5138

5138

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M 16 x 1.0	541052 1610	78,40	541053 1610	78,40	075690 D002	20,-
M 16 x 1.5	541052 1615	71,20	541053 1615	71,20	075690 D002	20,-
M 18 x 1.0	541052 1810	82,40	541053 1810	82,40	075690 D002	20,-
M 18 x 1.5	541052 1815	75,30	541053 1815	75,30	075690 D002	20,-
M 20 x 1.0	541052 2010	87,50	541053 2010	87,50	075690 D002	20,-
M 20 x 1.5	541052 2015	80,90	541053 2015	80,90	075690 D002	20,-
M 20 x 2.0	541052 2020	87,-	541053 2020	87,-	075690 D002	20,-
M 22 x 1.5	541052 2215	86,50	541053 2215	86,50	075690 D002	20,-
M 24 x 1.0	541052 2410	102,50	541053 2410	102,50	075690 D002	20,-
M 24 x 1.5	541052 2415	92,10	541053 2415	92,10	075690 D002	20,-
M 24 x 2.0	541052 2420	96,70	541053 2420	96,70	075690 D002	20,-
M 25 x 1.5	541052 2515	96,20	541053 2515	96,20	075690 D002	20,-
M 26 x 1.5	541052 2615	98,70	541053 2615	98,70	075690 D002	20,-
M 27 x 1.5	541052 2715	102,50	541053 2715	102,50	075690 D002	20,-

5138

5138

Continued on next page >>>

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M 27 x 2.0	541052 2720	107,-	541053 2720	107,-	075690 D002	20,-
M 28 x 1.5	541052 2815	106,-	541053 2815	106,-	075690 D002	20,-
M 30 x 1.0	541052 3010	132,50	541053 3010	132,50	075690 D002	20,-
M 30 x 1.5	541052 3015	111,50	541053 3015	111,50	075690 D002	20,-
M 30 x 2.0	541052 3020	123,-	541053 3020	123,-	075690 D002	20,-
M 32 x 1.5	541052 3215	118,50	541053 3215	118,50	075690 D002	20,-
M 33 x 1.5	541052 3315	130,-	541053 3315	130,-	075690 D002	20,-
M 33 x 2.0	541052 3320	137,-	541053 3320	137,-	075690 D002	20,-
M 35 x 1.5	541052 3515	135,50	541053 3515	135,50	075690 D002	20,-
M 36 x 1.5	541052 3615	138,-	541053 3615	138,-	075690 D002	20,-
M 36 x 2.0	541052 3620	144,50	541053 3620	144,50	075690 D002	20,-
M 38 x 1.5	541052 3815	146,50	541053 3815	146,50	075690 D002	20,-
M 40 x 1.5	541052 4015	154,-	541053 4015	154,-	075690 D002	20,-
M 40 x 2.0	541052 4020	161,50	541053 4020	161,50	075690 D002	20,-
M 42 x 1.5	541052 4215	161,50	541053 4215	161,50	075690 D002	20,-
M 42 x 2.0	541052 4220	159,50	541053 4220	159,50	075690 D002	20,-
	5138		5138			

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M 45 x 1.5	541052 4515	164,-	541053 4515	164,-	075690 D002	20,-
M 45 x 2.0	541052 4520	171,50	541053 4520	171,50	075690 D002	20,-
M 48 x 1.5	541052 4815	168,50	541053 4815	168,50	075690 D002	20,-
M 48 x 2.0	541052 4820	176,50	541053 4820	176,50	075690 D002	20,-
M 50 x 1.5	541052 5015	172,50	541053 5015	172,50	075690 D002	20,-
M 50 x 2.0	541052 5020	182,-	541053 5020	182,-	075690 D002	20,-
M 52 x 1.5	541052 5215	179,-	541053 5215	179,-	075690 D003	22,-
M 52 x 2.0	541052 5220	188,50	541053 5220	188,50	075690 D003	22,-
M 55 x 1.5	541052 5515	187,-	541053 5515	187,-	075690 D003	22,-
M 55 x 2.0	541052 5520	197,-	541053 5520	197,-	075690 D003	22,-
M 56 x 1.5	541052 5615	194,-	541053 5615	194,-	075690 D003	22,-
M 56 x 2.0	541052 5620	198,-	541053 5620	198,-	075690 D003	22,-
M 58 x 1.5	541052 5815	193,50	541053 5815	193,50	075690 D003	22,-
M 58 x 2.0	541052 5820	198,-	541053 5820	198,-	075690 D003	22,-
M 60 x 1.5	541052 6015	203,-	541053 6015	203,-	075690 D003	22,-
M 60 x 2.0	541052 6020	212,-	541053 6020	212,-	075690 D003	22,-
	5138		5138			

**SARA® Sets for right-hand ISO metric thread, DIN 13**

DIN 13  
DIN ISO 1502



**Sets for right-hand ISO metric thread, DIN 13**

Contents	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
M3, 4, 5, 6, 8, 10 and 12	541060 0001	375,-	541061 0001	375,-	073103 D069	140,-
	5138		5138			

**SARA® Thread gauges for Whitworth pipe threads**

DIN EN ISO 228



**Thread plug gauge**

Thread	Good		DAkkS calibration	
	art.no.	€	art.no.	€
G 1/8"	541003 0001	63,10	075016 D002	20,-
G 1/4"	541003 0003	67,70	075016 D002	20,-
G 3/8"	541003 0005	76,80	075016 D002	20,-
G 1/2"	541003 0007	89,-	075016 D002	20,-
G 3/4"	541003 0011	103,50	075016 D002	20,-
G 1"	541003 0013	126,50	075016 D002	20,-
G 1 1/4"	541003 0015	188,50	075016 D002	20,-
G 1 1/2"	541003 0017	209,-	075016 D002	20,-
G 2"	541003 0019	270,-	075016 D002	20,-
	5137			



541054 0013

541055 0013

**Thread ring gauge**

Thread	Good		Reject		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
G 1/8"	541054 0001	62,10	541055 0001	62,10	075690 D002	20,-
G 1/4"	541054 0003	74,30	541055 0003	74,30	075690 D002	20,-
G 3/8"	541054 0005	81,40	541055 0005	81,40	075690 D002	20,-
G 1/2"	541054 0007	91,60	541055 0007	91,60	075690 D002	20,-
G 3/4"	541054 0011	111,-	541055 0011	111,-	075690 D002	20,-
G 1"	541054 0013	135,50	541055 0013	135,50	075690 D002	20,-
G 1 1/4"	541054 0015	161,-	541055 0015	161,-	075690 D002	20,-
G 1 1/2"	541054 0017	174,-	541055 0017	174,-	075690 D002	20,-
G 2"	541054 0019	229,-	541055 0019	229,-	075690 D002	20,-
	5138		5138			

## SARA® Thread gauges for tapered American NPT pipe threads

- In accordance with ANSI / ASME B.1.20.1



### NPT limit plug gauge

Thread nominal Ø mm	art.no.	€	DAkkS calibration	
			art.no.	€
1/16"-27	541005 0001	183,-	075682 D001	58,-
1/8"-27	541005 0002	183,-	075682 D001	58,-
1/4"-18	541005 0003	194,-	075682 D001	58,-
3/8"-18	541005 0004	210,-	075682 D001	58,-
1/2"-14	541005 0005	228,-	075682 D001	58,-
3/4"-14	541005 0006	257,-	075682 D001	58,-
1"-11.5	541005 0007	296,-	075682 D001	58,-
1 1/4"-11.5	541005 0008	370,-	075682 D001	58,-
1 1/2"-11.5	541005 0009	420,-	075682 D001	58,-
2"-11.5	541005 0010	519,-	075682 D002	72,-
2 1/2"-8	541005 0011	609,-	075682 D002	72,-
3"-8	541005 0012	759,-	075682 D002	72,-

5137



### NPT limit ring gauge

Thread nominal Ø mm	art.no.	€	DAkkS calibration	
			art.no.	€
1/16"-27	541057 0001	260,-	075682 D001	58,-
1/8"-27	541057 0002	298,-	075682 D001	58,-
1/4"-18	541057 0003	298,-	075682 D001	58,-
3/8"-18	541057 0004	298,-	075682 D001	58,-
1/2"-14	541057 0005	326,-	075682 D001	58,-
3/4"-14	541057 0006	355,-	075682 D001	58,-
1"-11.5	541057 0007	405,-	075682 D001	58,-
1 1/4"-11.5	541057 0008	539,-	075682 D001	58,-
1 1/2"-11.5	541057 0009	599,-	075682 D001	58,-
2"-11.5	541057 0010	759,-	075682 D002	72,-
2 1/2"-8	541057 0011	849,-	075682 D002	72,-
3"-8	541057 0012	1.069,-	075682 D002	72,-

5138

## JBO Thread gauges MultiCheck with depth measurement

DIN  
13DIN ISO  
1502

- Simultaneous testing of the thread gauge accuracy and the thread depth, time savings of up to 50%
- Direct reading of the thread depth using the scale on the sliding sleeve
- Thread depth measurements up to 4xD
- Go and no-go ends made of wear-resistant gauge steel, aged, hardened and precision-ground
- Tolerances and dimensions in accordance with DIN ISO 1502
- Easy replacement of test pieces by user
- Replacement test piece, test piece for thread types, thread gauges with reading 0.01, analogue or digital on request



Thread	n mm	Reading mm	art.no.		DAkkS calibration	
			art.no.	€	art.no.	€
M3	0.5	0.5	541015 0003	291,-	075116 D002	46,-
M4	0.7	0.5	541015 0004	288,-	075116 D002	46,-
M5	0.8	0.5	541015 0005	299,-	075116 D002	46,-
M6	1.0	0.5	541015 0006	263,-	075116 D002	46,-
M8	1.25	0.5	541015 0008	328,-	075116 D002	46,-
M10	1.5	0.5	541015 0010	331,-	075116 D002	46,-
M12	1.75	0.5	541015 0012	355,-	075116 D002	46,-

5137





## SARA® Protractor

- Open graduated semicircle made of normal steel
- Scale 0 to 180°, reading 1°, locking screw
- Laser-etched scale, high-contrast, easy-readable, white millimetre division
- Hard-coded aluminium (HRC63)
- Non-scratch, black anodised surface

Protractor mm	Rail length mm	art.no.	€	DAkkS calibration art.no.	€
80	120	542002 0080	23,-	075006 D001	32,-
120	150	542002 0120	25,20	075006 D001	32,-
150	200	542002 0150	32,70	075006 D001	32,-
200	300	542002 0200	39,30	075006 D001	32,-
300	500	542002 0300	74,30	075006 D001	32,-

5139



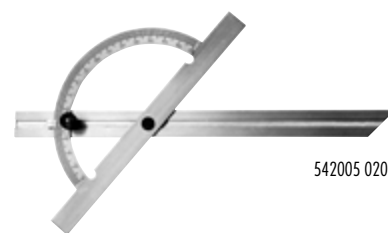
542002 0080

## Graduator, adjustable

- Open graduated semicircle made from normal steel
- Matt chrome-plated scale with an anti-glare finish
- Scale 10 to 170° with 1° readings
- Bar can be adjusted lengthwise using a locking screw, bar side bevelled 45°

Protractor mm	Rail length mm	art.no.	€	DAkkS calibration art.no.	€
100	150	542005 0100	45,50	075006 D001	32,-
150	300	542005 0150	55,-	075006 D001	32,-
200	400	542005 0200	66,-	075006 D001	32,-
300	600	542005 0300	113,50	075006 D001	32,-

5139



542005 0200

## SARA® Digital graduator

- Adjustment and zeroing possible on any level surface
- Measuring bar can be fixed in any position using the knurled-head screw
- Stainless steel, measuring edges precision-ground
- Measurement range: 180°
- Readings: 0.05°
- Accuracy: +/- 0.3°
- Functions: user-defined zeroing, hold value, rotate display for overhead measurement
- Supplied in a synthetic leather pouch with 1x CR2032 battery, no. 548079 6032



542007 0120

542007 0150

542007 0200

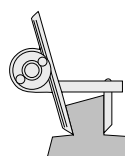
Protractor mm	Rail length mm	art.no.	€	DAkkS calibration art.no.	€
120	150	542007 0120	115,-	075006 D001	32,-
150	200	542007 0150	158,-	075006 D001	32,-
200	300	542007 0200	195,50	075006 D001	32,-

5139

## SARA® Universal goniometer with magnifier and fine adjustment



- Reading parts matt chrome-plated
- Parallax-free reading with magnifier
- Scaling 4 x 90°, reading 1/12° = 5 min.
- 3 rails, 150, 200 and 300 mm, can be repositioned and locked
- 1 additional angle



Application example with additional angle



Rail length mm	art.no.	€	DAkkS calibration art.no.	€
150, 200, 300	542025 0001	139,-	075007 D001	42,-

5139



## SARA® Digital universal goniometer

Werk-  
norm



- Digital display with simultaneous display of values in degrees, minutes and seconds, and decimal
- Automatic switch-off
- Simple adjustment using fixed reference points
- Fully movable and lockable measuring bar
- 150 and 300 mm rail length
- Fine adjustment for precisely calibrating angles
- **Functions:** ON/OFF, ZERO for user-defined zeroing, reverse counting direction
- Supplied with 2x rails, additional angle, 60 x 50 mm framing square and CR2032 batteries, no. 548079 6032



Measurement range	Reading	Error limit mm	art.no.		DakkS calibration	
			€	art.no.	€	
4x90°/2x180°/360°	0.005°/10"	+/- 5 min	542500 0360	509,-	075007 D001	42,-
5139						

## Mitutoyo Universal goniometer DIGIMATIC

Werk-  
norm



Digi-  
matic

USB

- Digital display in degrees or minutes, zeroing in any position
- Hardened stainless steel measuring bar and measuring edges
- Automatic switch-off after 10 minutes of inactivity
- Simple adjustment using fixed reference points
- Fully movable and lockable measuring bar
- Fine adjustment for precisely calibrating angles
- Ability to pre-set angles
- Can be combined with height meters using the holder provided
- Battery life up to 2,000 hours
- **Functions:** ON/OFF, PRESET for pre-setting user-defined angles, DATA/HOLD, switch from decimal to degrees and minutes, ZERO for user-defined zeroing, reverse counting direction
- Supplied with height meter holder and CR2032 battery, no. 548079 6032
- **Optional accessories:** Digimatic cable type F, no. 563100 0051 (1 m), no. 563100 0052 (2 m); USB cable type F-USB, no. 563110 0006



Measurement range	Error limit mm	Repetition precision	Rail length mm	art.no.		DakkS calibration	
				€	art.no.	€	
-360° to +360°	± 2 min.	1 min.	150 mm	543001 0150	814,-	075007 D001	42,-
-360° to +360°	± 2 min.	1 min.	300 mm	543001 0301	843,-	075007 D001	42,-
5106							

## SARA® Measuring tool set for toolmakers



- Particularly suitable for working on tools and mould construction
- Contents, 1 unit each:  
Straightedge DIN 874, 100 mm with protective insulation  
Bevel edge square DIN 875/00, 75 x 55 mm / 40 x 28 mm / 25 x 20 mm  
Gauge block scriber 9 x 9 x 9 x 60 mm

Description	art.no.		DakkS calibration	
	€	art.no.	€	
Measuring tool set	544050 0001	148,50	073103 D023	124,-
5140				



## ATORN® Stock square and try square



- Accuracy 0, 1 and 2
- Made from high-strength normal or stainless steel
- Upright edges and flat sides finely ground
- Supplied in moulded packaging up to size 300 x 200 mm

### Accuracy 0 (DIN 875/0), normal steel

Limb length	Cross section mm	Framing square		Try square		DAkkS calibration	
		art.no.	€	art.no.	€	art.no.	€
75 x 50 mm	15 x 5	545001 0002	15,40	545010 0002	26,70	075664 D001	32,-
100 x 70 mm	20 x 5	545001 0003	18,35	545010 0003	29,50	075664 D001	32,-
150 x 100 mm	25 x 5	545001 0004	22,-	545010 0004	45,20	075664 D002	40,-
200 x 130 mm	30 x 6	545001 0005	31,20	545010 0005	59,-	075664 D002	40,-
250 x 165 mm	35 x 7	545001 0006	44,20	545010 0006	88,50	075664 D002	40,-
300 x 200 mm	40 x 8	545001 0007	54,-	545010 0007	116,-	075664 D002	40,-
		5193		5193			

### Accuracy 0 (DIN 875/0), stainless steel

Limb length	Cross section mm	Framing square		Try square		DAkkS calibration	
		art.no.	€	art.no.	€	art.no.	€
75 x 50 mm	15 x 5	545007 0002	42,90	545017 0002	50,70	075664 D001	32,-
100 x 70 mm	20 x 5	545007 0003	51,60	545017 0003	64,10	075664 D001	32,-
150 x 100 mm	25 x 5	545007 0004	68,30	545017 0004	86,50	075664 D002	40,-
200 x 130 mm	30 x 6	545007 0005	78,90	545017 0005	104,-	075664 D002	40,-
		5193		5193			

### Accuracy 1 (DIN 875/1), normal steel

Limb length	Cross section mm	Framing square		Try square		DAkkS calibration		Factory calibration
		art.no.	€	art.no.	€	art.no.	€	
75 x 50 mm	15 x 5	545020 0002	10,20	545025 0002	13,25	075664 D001	32,-	
100 x 70 mm	20 x 5	545020 0003	12,05	545025 0003	15,70	075664 D001	32,-	
150 x 100 mm	25 x 5	545020 0004	15,70	545025 0004	22,40	075664 D002	40,-	
200 x 130 mm	30 x 6	545020 0005	19,95	545025 0005	26,70	075664 D002	40,-	
250 x 165 mm	35 x 7	545020 0006	26,90	545025 0006	35,20	075664 D002	40,-	
300 x 200 mm	40 x 8	545020 0007	37,50	545025 0007	47,20	075664 D002	40,-	
500 x 330 mm	50 x 10	545020 1009	173,-	545025 1009	216,-	075664 D002	40,-	
1000 x 660 mm	70 x 15	545020 1012	599,-	545025 1012	929,-			073103 W130 40,-
		5193		5193				

### Accuracy 1 (DIN 875/1), stainless steel

Limb length	Cross section mm	Framing square		Try square		DAkkS calibration		Factory calibration
		art.no.	€	art.no.	€	art.no.	€	
75 x 50 mm	15 x 5	545021 0002	10,50	545026 0002	16,30	075664 D001	32,-	
100 x 70 mm	20 x 5	545021 0003	12,55	545026 0003	19,35	075664 D001	32,-	
150 x 100 mm	25 x 5	545021 0004	16,-	545026 0004	29,30	075664 D002	40,-	
200 x 130 mm	30 x 6	545021 0005	25,60	545026 0005	37,30	075664 D002	40,-	
250 x 165 mm	35 x 7	545021 0006	31,80	545026 0006	48,30	075664 D002	40,-	
300 x 200 mm	40 x 8	545021 0007	40,-	545026 0007	71,20	075664 D002	40,-	
500 x 330 mm	50 x 10	545021 1009	318,-	545026 1009	375,-	075664 D002	40,-	
1000 x 660 mm	70 x 15	545021 1012	1.119,-	545026 1012	1.629,-			073103 W130 40,-
		5193		5193				

### Accuracy 2 (DIN 875/2), normal steel

Limb length	Cross section mm	Framing square		Try square		DAkkS calibration		Factory calibration
		art.no.	€	art.no.	€	art.no.	€	
75 x 50 mm	15 x 5	545030 0002	10,-	545035 0002	13,05	075664 D001	32,-	
100 x 70 mm	20 x 5	545030 0003	11,40	545035 0003	15,30	075664 D001	32,-	
150 x 100 mm	25 x 5	545030 0004	15,30	545035 0004	22,20	075664 D002	40,-	
200 x 130 mm	30 x 6	545030 0005	19,35	545035 0005	26,70	075664 D002	40,-	
250 x 165 mm	35 x 7	545030 0006	26,70	545035 0006	35,-	075664 D002	40,-	
300 x 175 mm	35 x 7	545030 0007	37,10	545035 0007	46,-	075664 D002	40,-	
500 x 250 mm	40 x 8	545030 1009	78,40	545035 1009	101,-	075664 D002	40,-	
600 x 300 mm	40 x 8	545030 1010	104,-	545035 1010	126,50	075664 D002	40,-	
750 x 375 mm	45 x 10	545030 1011	138,50	545035 1011	157,-			073103 W130 40,-
1000 x 500 mm	50 x 10	545030 1012	216,-	545035 1012	220,-			073103 W130 40,-
		5193		5193				



## ATORN® Bevel edge square

DIN  
875/00

INOX



- Accuracy 00
- Bevelled measuring edges ground and lapped
- Flat sides ground

Limb length	Cross section mm			DAkkS calibration	
		art.no.	€	art.no.	€
50 x 40 mm	13 x 4	544005 0003	42,20	075664 D001	32,-
75 x 50 mm	15 x 4.5	544005 0004	46,-	075664 D001	32,-
100 x 70 mm	19 x 6	544005 0005	60,10	075664 D001	32,-
150 x 100 mm	25 x 7	544005 0006	76,30	075664 D002	40,-
200 x 130 mm	32 x 7	544005 0007	104,-	075664 D002	40,-
300 x 200 mm	40 x 8	544005 0009	220,-	075664 D002	40,-

5193



544005 0004

## Metalworker's framing and try square

- For simple alignment and marking-out work in metalwork shops
- Galvanised surface
- Made from high-strength normal steel
- Upright edges and flat sides finished
- Accuracy in accordance with company standards **(cannot be calibrated)**

Limb length	Cross section mm	Framing square		Try square	
		art.no.	€	art.no.	€
150 x 100 mm	20 x 5	546001 0001	7,15	546005 0001	10,65
200 x 130 mm	22 x 5	546001 0002	7,60	546005 0002	13,50
250 x 160 mm	25 x 5	546001 0003	9,10	546005 0003	15,90
300 x 180 mm	25 x 5	546001 0004	11,15	546005 0004	20,30
400 x 230 mm	30 x 5	546001 0005	13,50	546005 0005	23,90
500 x 280 mm	30 x 5	546001 0006	15,90	546005 0006	32,60
600 x 330 mm	30 x 5	546001 0007	19,95	546005 0007	48,50
750 x 375 mm	30 x 5	546001 0008	23,20	546005 0008	51,90
1000 x 500 mm	30 x 5	546001 0009	31,10	546005 0009	78,20

5140

5140



## ATORN® Acute angle with stop

DIN  
875/2

- 45°
- Made from normal steel
- Upright edges and flat sides finely ground

Limb length	Cross section mm			DAkkS calibration	
		art.no.	€	art.no.	€
120 x 80 mm	20 x 5	546025 0120	39,90	075664 D002	40,-
150 x 100 mm	20 x 5	546025 0150	42,60	075664 D002	40,-
200 x 130 mm	25 x 5	546025 0200	54,-	075664 D002	40,-

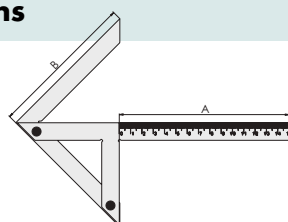
5193



546025 0120

## SARA® Centring square with millimetre divisions

- Accuracy in accordance with DIN 875/1
- Hard-coded aluminium (HRC63)
- Non-scratch, black anodised surface
- Laser-etched scale
- Upright edges and flat sides finely ground
- Rail with high-contrast, easy-readable, white millimetre division



A mm	B mm	for shafts with max. Ø mm			DAkkS calibration	
			art.no.	€	art.no.	€
100	70	90	546011 0100	40,50	075665 D001	50,-
150	130	190	546011 0150	43,60	075665 D002	58,-
200	150	220	546011 0200	48,20	075665 D002	58,-
300	180	280	546011 0300	87,50	075665 D002	58,-
400	250	380	546011 0400	195,50	075665 D002	58,-
500	330	530	546011 0500	229,-	075665 D002	58,-

5139



## Scribers

### Fixed scribers

- **scriber, straight**

CrV steel, hardened, one-piece design with straight tip and milled handle

- **Pointed scriber**, 165 mm

CrV steel, hardened, one-piece design with straight and angled tips, milled handle

- **Pointed scriber**, 250 mm

CrV steel, hardened, fitted with one straight and one angled screw-in needle, milled handle length 80 mm

Description	L mm	art.no.	€
Straight	180	<b>547001</b> 0180	<b>3,92</b>
Angled	165	547001 0165	<b>5,30</b>
Angled	250	547001 0250	<b>3,55</b>

5142



### Scribers with replaceable carbide needles

- **ATORN special carbide scriber** with push-on clip

Replaceable and re-grindable needle, robust collet, plastic shank, for materials up to approx. 60° HRC

- **ATORN special carbide scriber** with push-on clip, retractable pencil system

Replaceable needle, robust collet, metal shank, for materials up to approx. 60 HRC

- **TICOM ErgoPlus**-Carbide scriber with push-on clip

Replaceable and re-grindable needle, robust collet, metal shank, for materials up to approx. 60° HRC

Description	L mm	art.no.	€
ATORN scriber with push-on clip	150	<b>547005</b> 0001	<b>16,25</b>
ATORN scriber with push-on clip, retractable pencil system	146	547005 0002	<b>17,20</b>
TICOM scriber with push-on clip	150	547005 0003	<b>20,30</b>
Scriber, 150 mm with carbide-pointed tip, hexagonal push-on clip, chrome-plated	150	547005 0004	<b>5,70</b>
Spare needles in a brass sleeve, Ø 2 for 547005 0001 + 547005 0003	32	547005 0010	<b>6,55</b>

5142



## TICOM® Marker pen

- **MetalMarker**

- Highlights in white with a super-fine stroke width of approx. 0.8 mm
- Indelible, light-resistant, quick-drying
- Easily removed with organic solvents such as petroleum ether

L mm	Ø mm	art.no.	€
133	11	<b>547005</b> 0100	<b>10,70</b>

5142



547005 0100

## Divider

**DIN  
6486**

- Strong shape with angular arms
- Made from finely ground forged steel
- Milled joint with rivet hinge
- Hardened tips and measuring faces
- With or without wing

L mm	Without wing		with wing	
	art.no.	€	art.no.	€
150	<b>547010</b> 0150	<b>10,50</b>	<b>547015</b> 0150	<b>14,35</b>
200	547010 0200	<b>12,75</b>	547015 0200	<b>17,50</b>
250			547015 0250	<b>21,90</b>
300	547010 0300	<b>21,30</b>	547015 0300	<b>28,80</b>

5142

5142



547010 0200

547015 0200

## Precision spring-loaded divider

- Strong square design
- Made from ground and polished steel
- Hardened tips and measuring faces
- Quick and fine adjustment by means of a spindle with locking nut
- Annular springs ensure constant spring tension
- With fixed or replaceable tips

L mm	Fixed pointed tips		Replaceable pointed tips	
	art.no.	€	art.no.	€
140	<b>547020</b> 0140	<b>11,95</b>	<b>547025</b> 0140	<b>13,25</b>
190	547020 0190	<b>14,70</b>	547025 0190	<b>15,40</b>
290	547020 0290	<b>17,70</b>	547025 0290	<b>18,55</b>
Spare pointed tip			547025 0002	<b>2,02</b>
	5142		5142	



547025 0140

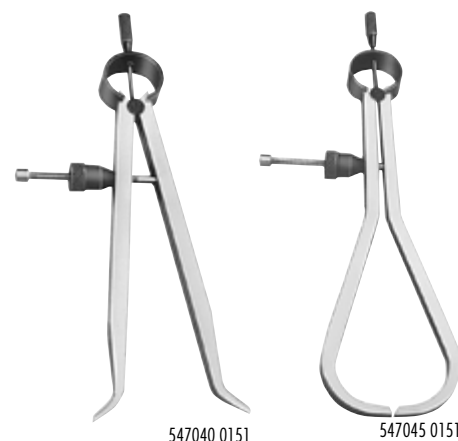
547020 0140

## Inside and outside spring callipers

**DIN  
6487**

- With angular steel arms
- Tips and measuring faces hardened and ground
- Quick and fine adjustment by means of a spindle with locking nut
- Annular springs ensure constant spring tension

L mm	Inside spring calliper		Outside spring calliper	
	art.no.	€	art.no.	€
150	<b>547040</b> 0151	<b>9,25</b>	<b>547045</b> 0151	<b>8,75</b>
200	547040 0201	<b>10,90</b>	547045 0201	<b>11,05</b>
300	547040 0301	<b>14,40</b>	547045 0301	<b>14,70</b>
	5142		5142	



547040 0151

547045 0151

## SARA® Marking gauge

- Hardened aluminium (HRC63)
- Non-scratch, black anodised surface
- Laser-etched scale
- Flat rail
- Vernier scale 0.05 mm

Measurement range mm	art.no.		DkkS calibration	
	art.no.	€	art.no.	€
200	<b>547401</b> 0200	<b>29,-</b>	072008 D001	<b>14,-</b>
300	547401 0300	<b>33,40</b>	072008 D002	<b>19,-</b>
	5108			



## Scribing calliper

**INOX**


- For quick and simple marking out
- Reading parts matt chrome-plated
- Raised guide edges
- Inch/mm scale divisions
- Vernier scale 0.10 mm / 1/128 inch

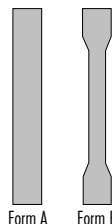
Designation	Measurement range mm	art.no.		DkkS calibration	
		art.no.	€	art.no.	€
Scribing calliper	200	<b>500810</b> 0102	<b>47,80</b>	072008 D001	<b>14,-</b>
Scribing calliper	400	500810 0201	<b>104,-</b>	072008 D003	<b>31,-</b>
Spare scriber		500810 0401	<b>3,77</b>		
		5108			



## Precision flat ruler

**DIN 874**

- Alloyed special steel, ground on all sides
- Test surface in accordance with DIN 874
- Form A: rectangular cross-section  
Form B: I-shaped cross-section with two handling slots
- Accuracy 0: for precision testing work  
Accuracy 1: for inspection work  
Accuracy 2: for general workshop use
- With etched test result
- Other lengths and stainless steel version available on request
- Versions from 1.500 mm upwards supplied ex works, excluding packaging



### Accuracy 0

L mm	Cross section mm	Planarity of the test faces µm	Form	Weight kg	Special steel art.no.	€	Factory calibration art.no.	€	DAkkS calibration art.no.	€
500	50 x 10	7	A	1.90	<b>547618</b> 0500	<b>80,40</b>			075035 D002	<b>44,-</b>
1000	60 x 12	12	A	5.65	547618 1000	<b>201,-</b>			075035 D003	<b>62,-</b>
1500	70 x 15	17	A	12.30	547618 1500	<b>370,-</b>	075035 W902	<b>52,50</b>		
2000	80 x 15	22	B	18.4	547618 2000	<b>619,-</b>	075035 W902	<b>52,50</b>		

5143

### Accuracy 1

L mm	Cross section mm	Planarity of the test faces µm	Form	Weight kg	art.no.	€	Factory calibration art.no.	€	DAkkS calibration art.no.	€
500	40 x 8	12	A	1.25	<b>547620</b> 0500	<b>42,40</b>			075035 D002	<b>44,-</b>
1000	50 x 10	21	A	3.80	547620 1000	<b>80,-</b>			075035 D003	<b>62,-</b>
1500	60 x 12	29	A	8.00	547620 1500	<b>192,50</b>	075035 W902	<b>52,50</b>		
2000	70 x 15	37	B	11.90	547620 2000	<b>485,-</b>	075035 W902	<b>52,50</b>		

5143

### Accuracy 2

L mm	Cross section mm	Planarity of the test faces µm	Form	Weight kg	art.no.	€	Factory calibration art.no.	€	DAkkS calibration art.no.	€
500	30 x 6	21	A	0.70	<b>547622</b> 0500	<b>28,10</b>			075035 D002	<b>44,-</b>
1000	40 x 8	33	A	2.50	547622 1000	<b>57,60</b>			075035 D003	<b>62,-</b>
1500	50 x 10	46	A	6.00	547622 1500	<b>134,-</b>	075035 W902	<b>52,50</b>		
2000	60 x 12	58	A	11.00	547622 2000	<b>191,50</b>	075035 W902	<b>52,50</b>		

5143



Etched test result

## Steel workshop ruler

- Uprights ground and precisely adjusted
- One side with precise mm-division
- Tolerance class in accordance with DIN 2268
- Form A: 10 mm protective ends on both sides, DIN 866/A  
Form B: 10 mm protective end on right-hand side, DIN 866/B
- Other lengths and stainless steel version available on request
- Versions from 2000 mm upwards supplied ex works, excluding packaging

### DIN 866/A

L mm	Cross section mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
500	30 x 6	0.70	<b>548106</b> 0500	<b>33,70</b>	075003 D001	<b>46,-</b>
1000	40 x 8	2.50	548106 1000	<b>81,80</b>	075003 D002	<b>59,-</b>
2000	50 x 10	7.90	548106 2000	<b>210,-</b>	075003 D003	<b>96,-</b>

5143

### DIN 866/B

L mm	Cross section mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
500	25 x 5	0.50	<b>548109</b> 0500	<b>20,10</b>	075003 D001	<b>46,-</b>
1000	30 x 6	1.40	548109 1000	<b>38,40</b>	075003 D002	<b>59,-</b>
2000	40 x 8	5.00	548109 2000	<b>98,90</b>	075003 D003	<b>96,-</b>

5143





## ATORN® Straightedge

DIN  
874

INOX



- Wedge-shaped cross-section
- Hardened and burnished special steel, or hardened and matt chrome-plated stainless steel with an anti-glare finish
- Bevelled measuring edge, precision-lapped
- With plastic insulated handle

L mm	hardened		Stainless steel, hardened		DAkkS calibration	
	art.no.	€	art.no.	€	art.no.	€
75	547501 0075	13,65	547505 0075	19,80	075034 D001	28,-
100	547501 0100	15,50	547505 0100	21,40	075034 D001	28,-
125	547501 0125	18,15	547505 0125	24,50	075034 D002	34,-
150	547501 0150	20,60	547505 0150	32,20	075034 D002	34,-
200	547501 0200	25,70	547505 0200	37,20	075034 D002	34,-
300	547501 0301	48,10	547505 0301	69,20	075034 D003	48,-
400	547501 0401	86,50	547505 0401	125,50	075034 D003	48,-
500	547501 0501	117,-	547505 0501	167,-	075034 D003	48,-
	5193		5193			



547501 0100

## Steel scale

INOX

- Spring band steel
- Matt-finished surface, divisions and digits etched in black
- Scale accuracy: DIN 7168 m



548001 0300

L mm	Cross section mm	art.no.	€
200	13 x 0.5	548001 0200	2,12
300	15 x 0.5	548001 0300	2,67
500	20 x 0.5	548001 0500	5,20
1000	20 x 0.5	548001 1000	17,70
2000	30 x 1.0	548001 2000	45,30
		5143	



## Tape measure Circometer CJU

- For measuring outer circumference and diameter
- Spring band steel with millimetre division, laser-scaled
- Vernier scale 0.1 mm
- Error margins in accordance with DIN 866
- Tape width 16 mm
- **Normal steel, or V2A version made from stainless spring steel**



548050 0700

Measurement range Ø mm	Measurement range scope mm	Normal steel art.no.	€	Stainless steel art.no.	€
20-300	60-950	548050 0300	73,80	548055 0300	87,-
300-700	940-2200	548050 0700	89,30	548055 0700	112,50
700-1100	2190-3460	548050 1100	109,50	548055 1100	152,50
1100-1500	3450-4720	548050 1500	134,50	548055 1500	191,-
1500-1900	4710-5980	548050 1900	162,-	548055 1900	230,-
1900-2300	5960-7230	548050 2300	182,-	548055 2300	276,-
		5145		5145	



## ATORN® Spring tape measures

- Accuracy to EC Class II
- White steel strip
- Millimetre divisions on one side
- EC-tested

Length m	Max. measurement tolerance under EC standards ± mm		
	Class I	Class II	Class III
2	0,30	0,70	1,40
3	0,40	0,90	1,80
5	0,60	1,30	2,60
8	0,90	1,90	3,80

### With sliding end hook

L mm	Belt width mm	art.no.	€	DAkkS calibration art.no.	€
3	16	548032 0003	7,35	075004 D003	46,-
5	19	548032 0005	11,-	075004 D005	59,-
8	25	548032 0008	17,70	075004 D008	76,-

5144

### With magnetic end hook

L mm	Belt width mm	art.no.	€	DAkkS calibration art.no.	€
5	19	548032 1005	16,10	075004 D005	59,-

5144



## SOLA® Spring tape measures

### EC Class I accuracy

- Shock-proof ABS plastic casing, chrome-plated with belt clip
- Curved steel strip, painted yellow
- 2-part brake for pinpoint-accurate engagement
- Shock absorber system ensures gentle tape rewind
- For external and internal measurements

L mm	Belt width mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
3	13	0.4	548041 0003	18,85	075004 D003	46,-
5	19	0.6	548041 0005	31,10	075004 D005	59,-

5144

### EC Class II accuracy

- Sturdy, durable design
- High-strength plastic casing with belt clip
- Curved steel strip, painted yellow
- Automatic tape rewind and rewind lock
- Sliding end hook

L mm	Belt width mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
2	16	0.7	548030 0002	11,10	075004 D003	46,-
3	16	0.9	548030 0003	13,35	075004 D003	46,-
5	16	1.3	548030 0005	19,75	075004 D005	59,-

5144

### With viewing window, EC Class II accuracy

- Viewing window allows inside dimensions to be read easily
- High-strength plastic casing
- Automatic tape rewind and rewind lock
- Painted yellow
- Sliding end hook

L mm	Belt width mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
3	13	0.9	548040 0003	16,10	075004 D003	46,-

5144

### With magnetic end hook, EC Class II accuracy

- Shock-proof ABS plastic casing, chrome-plated with belt clip
- Curved steel strip, painted yellow
- Exact band brake for precise internal measurements
- For external and internal measurements

L mm	Belt width mm	Error limit mm	art.no.	€	DAkkS calibration art.no.	€
5	19	1.3	548030 1005	19,05	075004 D005	59,-
8	25	1.9	548030 1008	26,10	075004 D008	76,-

5144



## KOMELON® Spring tape measures

- Carbon steel
- Deburred edges
- Extremely precise and easy-to-read print
- With tape measure lock
- End hook and tape protector made of stainless steel
- For external and internal measurements
- Sliding end hook
- EC Class II accuracy

### SelfLock

- **Self-locking mechanism** for smooth tape rewind
- Easy-to-operate thumb button
- Ergonomic design for right-handed and left-handed users
- Long-lasting thanks to nylon coating
- Curved profile for improved stability and reduced sheen

L mm	Belt width mm	art.no.	€	DAkkS calibration	
				art.no.	€
3	16	548046 0030	13,25	075004 D003	46,-
5	19	548046 0050	18,65	075004 D005	59,-
8	25	548046 0080	33,-	075004 D008	76,-

5144



### MagGrip Dublx

- **Tape printed on both sides** for easy reading
- **Magnetic tip**
- Fluted end hook
- Long-lasting thanks to nylon coating
- Curved profile for improved stability and reduced sheen

L mm	Belt width mm	art.no.	€	DAkkS calibration	
				art.no.	€
5	19	548047 0050	20,50	075004 D005	59,-
8	25	548047 0080	32,40	075004 D008	76,-

5144



### INOX Rubber

- **Stainless steel** for improved rust resistance
- Nylon-coated silver tape for maximum service life
- Curved profile for improved stability and reduced sheen
- Shock-resistant housing

L mm	Belt width mm	art.no.	€	DAkkS calibration	
				art.no.	€
3	16	548048 0030	17,80	075004 D003	46,-
5	19	548048 0050	25,30	075004 D005	59,-
8	25	548048 0080	44,70	075004 D008	76,-

5144



### Powerblade II

- Wide tape measure with special curve for very high stability
- Hi-vis two-colour paint for easier reading
- Long-lasting thanks to nylon coating
- Patented magnet dual-end hook
- New compact casing with rubber protection

L mm	Belt width mm	art.no.	€	DAkkS calibration	
				art.no.	€
5	27	548042 0050	28,40	075004 D005	59,-
8	27	548042 0080	37,90	075004 D008	76,-

5144



### FastBack

- Fluted end hook
- Compact and ergonomic casing
- Long-lasting thanks to nylon coating
- FastBack model: with time-saving rapid reel action

L mm	Belt width mm	art.no.	€	DAkkS calibration	
				art.no.	€
20	10	548036 1020	35,-	075004 D020	139,-
30	10	548036 1030	44,50	075004 D030	189,-

5144

## Wooden folding ruler

- Selected wood
- Special UV paint guarantees resistance to moisture and dirt
- Easy-to-read black and red millimetre divisions, both sides, top and bottom
- EC Class III accuracy



548020 0002



Conjunction	L mm	Width mm	Number of sections	art.no.	€
Open rivets	2	16	10	548020 0002	3,82

5143

## ATORN® Wooden folding ruler

- Initial segment with identical scales on both sides, contrasting colours, particularly well-suited to marking out and transferring dimensions
- White segments with black scale, blue initial segment with white scale
- Robust design, with brass cap
- Scaled angle divisions
- Sturdy joint
- EC Class III accuracy



L mm	Width mm	Number of sections	art.no.	€
2	16	10	548022 0002	6,35

5143



...UNICHECK.

Flexible, exact, universal...

**ATORN®**  
Performance demands quality

## Thread pitch gauge

- For determining the pitch of external and internal threads
- Steel design with locking screw
- Stamped thread ridges
- Cannot be calibrated

Number of sheets	Design	Pitch metric 60° mm	Pitch Whitworth 55° TPI	art.no.	€
24	Metric 60°	0.25-6.0	-	<b>548501 0024</b>	<b>4,77</b>
52	Combined metric 60° and Whitworth 55°	0.25-6.0	62-4	548501 0052	<b>7,10</b>

5147



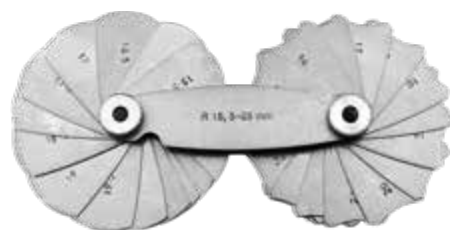
548501 0024

## Radius gauge

- Concave and convex gauges for testing internal and external curves that form part of a circle
- Steel design with milled individual leaves
- Clamping screw for securing the leaves
- Cannot be calibrated

Radii mm	n mm	art.no.	€
1.0- 7.0	1.0 to 3.0 = 0.25, from 3.0 = 0.5	<b>548505 0017</b>	<b>15,20</b>
7.5-15.0	7.5 to 15.0 = 0.5	548505 0016	<b>16,50</b>
15.5-25.0	15.5 to 20.0 = 0.5, from 20.0 = 1.0	548505 0015	<b>14,45</b>

5147



548505 0015

## Weld gauges

- 548531 0210 for testing perpendicular weld seams  
12 leaf design (3 / 3.5 / 4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7 / 8 / 9 / 10 / 12 mm)
- 548531 0211 for measuring flat weld seams and corner weld seams  
Slider design, 20 mm measurement range, 0.1 mm readings
- Cannot be calibrated

Design	art.no.	€
12 blades	<b>548531 0210</b>	<b>23,90</b>
With slider	548531 0211	<b>39,90</b>

5147



548531 0210

548531 0211

## Twist drill bit grinding gauge

- For testing chisel edge centricity
- Steel
- 118° angle with scale
- Cannot be calibrated



Area	art.no.	€
For twist drill bits up to Ø 50 mm	<b>548510 0001</b>	<b>2,29</b>

5147

## Threading tool and universal grinding gauge

- Steel
- With labelled recesses for the various angles and pitches
- Cannot be calibrated
- 5485150001 steel thread gauge for metric threads 60°
- 5485150002 steel thread gauge for Whitworth threads 55°
- 5485150003 trapezoidal threading tool gauge, 30°, for trapezoidal threads in accordance with DIN 103, pitch 2 - 12 mm
- 5485150004 universal threading tool for all common tapered and flat threads

Area	art.no.	€
Steel thread gauge, 60°	<b>548515 0001</b>	<b>4,33</b>
Steel thread gauge, 55°	548515 0002	<b>4,33</b>
Trapezoidal steel thread gauge, 30°	548515 0003	<b>4,84</b>
Universal threading tool gauge	548515 0004	<b>4,84</b>

5147



548515 0002



548515 0003

## Combined lathe tool and threading tool gauge

- With recesses for:  
Trapezoidal thread, DIN 103, pitch 2 - 12 mm / cutting angle 40° - 80°  
V thread, 55° and 60°
- Dimensions 90 x 40 x 2 mm
- Cannot be calibrated

Dimensions L x W x H mm	art.no.	€
90 x 40 x 2	<b>548531 0010</b>	<b>9,90</b>
	5147	

- Design as 548531 0011 but with riveted pointer for testing clearance angles

Dimensions L x W x H mm	art.no.	€
90 x 40 x 2	<b>548531 0011</b>	<b>13,55</b>
	5147	



## Measuring wedges

- For quick, reliable reading of measurement values for gap measurements
- Reading 0.1 mm
- not calibratable



Measurement range mm	Substance	art.no.	€
0.5 - 11	Plastic	<b>548300 5010</b>	<b>66,70</b>
		5145	

## Feeler gauge sets

- For measuring slots, gaps or play in bearing guides, bearings, pistons etc.
- Steel leaves can be used individually or combined
- Each leaf is labelled with its individual thickness measurement
- Cannot be calibrated

### Steel in a metal sleeve

- Spring-hardened steel leaves, 100 mm long, tapered
- With clamping screw

Number of sheets	Sheet thickness mm	n mm	art.no.	€
13	0.05-1.0	0.05-0.3 = 0.05 / from 0.3 = 0.1	<b>548520 0013</b>	<b>3,04</b>
20	0.05-1.0	0.05-1.0=0.05	<b>548520 0020</b>	<b>5,05</b>
			5147	



548520 0020

### Steel, ring-mounted

- Spring-hardened steel leaves, 200 mm long, constant width

Number of sheets	Sheet thickness mm	n mm	art.no.	€
13	0.05-1.0	0.05-0.3 = 0.05 / from 0.3 = 0.1	<b>548600 0013</b>	<b>11,80</b>
20	0.05-1.0	0.05-1.0=0.05	<b>548600 0020</b>	<b>14,25</b>
			5147	



548600 0013

### Brass

- Non-magnetic

Number of sheets	Sheet thickness mm	n mm	art.no.	€
20	0.05-1.0	0.05-1.0=0.05	<b>548521 0020</b>	<b>24,10</b>
			5147	





## SARA® Feeler gauge strip rolls, 13 mm x 5 m

- For testing and adjusting valve play and electrode spacing, for measuring bearing play or for use as assembly supports
- Spring-hardened steel strip
- Length 5 m, width 12.7 mm
- Slotted dispenser box
- From 0.08 mm tape thickness, printed with nominal dimension every 120 mm

### Normal steel

Thickness mm	Normal steel art.no.	€
0.01	548525 0001	56,80
0.02	548525 0002	43,60
0.03	548525 0003	16,40
0.04	548525 0004	16,40
0.05	548525 0005	13,85
0.06	548525 0006	11,95
0.07	548525 0007	11,95
0.08	548525 0008	11,95
0.09	548525 0009	11,95
0.10	548525 0010	11,95
0.12	548525 0012	11,95
0.15	548525 0015	11,95
0.18	548525 0018	11,95
0.20	548525 0020	11,95
0.25	548525 0025	11,95

5147

Thickness mm	Normal steel art.no.	€
0.30	548525 0030	11,95
0.35	548525 0035	13,85
0.40	548525 0040	13,85
0.45	548525 0045	13,85
0.50	548525 0050	13,85
0.55	548525 0055	20,80
0.60	548525 0060	20,80
0.65	548525 0065	20,80
0.70	548525 0070	20,80
0.75	548525 0075	20,80
0.80	548525 0080	20,80
0.85	548525 0085	22,10
0.90	548525 0090	22,10
0.95	548525 0095	22,10
1.00	548525 0100	22,10

5147



548525 0030

### Stainless steel

Thickness mm	Stainless steel art.no.	€
0.01	548524 0001	61,60
0.02	548524 0002	46,60
0.03	548524 0003	20,30
0.04	548524 0004	20,30
0.05	548524 0005	17,60
0.06	548524 0006	14,85
0.07	548524 0007	14,85
0.08	548524 0008	14,85

5147

Thickness mm	Stainless steel art.no.	€
0.09	548524 0009	14,85
0.10	548524 0010	14,85
0.12	548524 0012	14,85
0.15	548524 0015	14,85
0.18	548524 0018	14,85
0.20	548524 0020	14,85
0.25	548524 0025	14,85

5147

### Set

- 15 feeler gauge strips
- In a wall bracket with feeler gauge strip holder for dispensing strip sections



Description	Normal steel art.no.	€	Stainless steel art.no.	€
Feeler gauge strip set 0.01 to 0.25 mm 0.01 / 0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.10 / 0.12 / 0.15 / 0.18 / 0.20 / 0.25 mm	548525 1000	255,-	548524 1000	265,-
Feeler gauge strip set 0.30 to 1.00 mm 0.30 / 0.35 / 0.40 / 0.45 / 0.50 / 0.55 / 0.60 / 0.65 / 0.70 / 0.75 / 0.80 / 0.85 / 0.90 / 0.95 / 1.00 mm	548525 2000	305,-		

5147

5147



### Accessories

- Feeler gauge strip holder with clip for strips up to 13 mm in width
- Size 125 x 17

Designation	art.no.	€
Feeler gauge strip holder	548526 0001	4,33

5147



## Foil strips (precision gauge strip)

- For setting up tools and moulds
- Adjusting equipment and apparatus
- Aligning machinery and altering bearing play
- In plastic boxes, easy to roll out
- Roll 150 mm wide x 2,500 mm long
- **Materials:**  
548530....: Brass (CuZn 37/Ms 63)  
548535....: Unalloyed steel (SM band steel)  
548540....: Stainless steel (18 Cr 9 Ni)



Film thickness mm	Speaker size mm	Brass		Steel		Stainless steel	
		art.no.	€	art.no.	€	art.no.	€
0.025	80 x 80 x 170	<b>548530</b> 0025	<b>24,40</b>	<b>548535</b> 0025	<b>27,30</b>	<b>548540</b> 0025	<b>46,40</b>
0.050	80 x 80 x 170	548530 0050	24,30	548535 0050	20,60	548540 0050	37,10
0.075	80 x 80 x 170	548530 0075	27,60	548535 0075	18,65	548540 0075	36,-
0.100	80 x 80 x 170	548530 0100	30,50	548535 0100	17,50	548540 0100	37,90
0.150	80 x 80 x 170	548530 0150	36,30	548535 0150	17,70	548540 0150	43,80
0.200	80 x 80 x 170	548530 0200	43,80	548535 0200	18,55	548540 0200	51,40
0.250	80 x 80 x 170	548530 0250	49,50	548535 0250	20,50	548540 0250	55,10
0.300	115 x 115 x 170	548530 0300	61,60	548535 0300	25,20	548540 0300	56,40
0.400	115 x 115 x 170	548530 0400	68,30	548535 0400	28,20	548540 0400	64,50
0.500	115 x 115 x 170	548530 0501	77,30	548535 0501	31,20	548540 0501	71,40
		5147		5147		5147	

## hys Präzisions-Folien GmbH Feeler gauge strips in rolls

- For setting up tools and moulds, adjusting equipment and apparatus, compensating for tolerances, supporting equipment, aligning machinery, adjusting bearing play etc.
- **Materials:**  
548527.... / 548528.... C-steel, hardened spring band steel with material no. 1.1274, magnetic  
548529.... rust-free, hardened spring band stainless steel with material no. 1.4310, weak magnetism

Thickness mm	C-steel 25 mm x 5 m		C-steel 50 mm x 5 m		Stainless steel 100 mm x 5 m	
	art.no.	€	art.no.	€	art.no.	€
0.01	<b>548527</b> 0001	<b>61,10</b>	<b>548528</b> 0001	<b>87,-</b>	<b>548529</b> 0001	<b>119,-</b>
0.02	548527 0002	33,90	548528 0002	48,40	548529 0002	77,30
0.03	548527 0003	24,40	548528 0003	35,30		
0.04	548527 0004	24,30	548528 0004	34,80		
0.05	548527 0005	20,90	548528 0005	32,60	548529 0005	52,40
0.06	548527 0006	16,60	548528 0006	24,40		
0.07	548527 0007	16,60	548528 0007	24,40		
0.08	548527 0008	16,60	548528 0008	24,40		
0.09	548527 0009	16,60	548528 0009	24,40		
0.10	548527 0010	16,60	548528 0010	23,60	548529 0010	49,50
0.12			548528 0012	25,-		
0.15	548527 0015	17,-	548528 0015	25,-	548529 0015	49,50
0.18			548528 0018	25,30		
0.20	548527 0020	17,-	548528 0020	24,60	548529 0020	61,10
0.25	548527 0025	17,40	548528 0025	25,30	548529 0025	64,10
0.30	548527 0030	17,20	548528 0030	25,-	548529 0030	61,10
0.35			548528 0035	27,70		
0.40	548527 0040	19,05	548528 0040	27,70	548529 0040	70,70
0.45			548528 0045	27,70		
0.50	548527 0050	19,95	548528 0050	27,70	548529 0050	81,90
0.60	548527 0060	27,30	548528 0060	44,-	548529 0060	108,-
0.70	548527 0070	29,50	548528 0070	44,-	548529 0070	122,50
0.80	548527 0080	30,50	548528 0080	44,40	548529 0080	131,50
0.90	548527 0090	30,50	548528 0090	44,40	548529 0090	133,50
1.00	548527 0100	30,10	548528 0100	44,40	548529 0100	136,50
		5147		5147		5147



## hgs Präzisions-Folien GmbH Underlay foil (precision design)

- For setting up tools and moulds, adjusting equipment and apparatus, compensating for tolerances, supporting equipment, aligning machinery, adjusting bearing play etc.
- **Materials:**  
 548550.... C-steel, hardened spring band steel with material no. 1.1274, magnetic  
 548551.... /548552.... rust-free, hardened spring band stainless steel with material no. 1.4310, weak magnetism
- Supplied in sturdy sliding box  
 548550.... 10 sheets per box  
 548551.... / 548552.... 5 sheets per box

Thickness mm	C-steel 50 mm x 300 mm		Stainless steel 100 mm x 500 mm		Stainless steel 150 mm x 500 mm	
	art.no.	€	art.no.	€	art.no.	€
0.01	548550 0001	59,-	548551 0001	70,20		
0.02	548550 0002	33,50	548551 0002	39,90		
0.05	548550 0005	20,70	548551 0005	27,90	548552 0005	42,90
0.10	548550 0010	16,50	548551 0010	26,40	548552 0010	40,30
0.15	548550 0015	17,20	548551 0015	26,40	548552 0015	41,20
0.20	548550 0020	16,90	548551 0020	33,-	548552 0020	50,90
0.25	548550 0025	17,40	548551 0025	34,80	548552 0025	52,90
0.30	548550 0030	17,40	548551 0030	33,-	548552 0030	50,90
0.40	548550 0040	19,05	548551 0040	38,10	548552 0040	57,50
0.50	548550 0050	19,05	548551 0050	44,-	548552 0050	66,70
0.60	548550 0060	30,70	548551 0060	61,60	548552 0060	90,10
0.70	548550 0070	31,-	548551 0070	69,70	548552 0070	102,-
0.80	548550 0080	31,20	548551 0080	72,30	548552 0080	111,-
0.90	548550 0090	31,40	548551 0090	72,80	548552 0090	117,-
1.00	548550 0100	31,-	548551 0100	74,30	548552 0100	119,-
	5147		5147		5147	



## WNOGA Magnetic measuring stands PH

- For quick and precise positioning of dial indicators
- Improved fine adjustment on the magnetic base
- Strong, switchable magnetic base
- Universal holding fixture for common dial indicators
- Robust arm mechanism with three-point system
- Measuring instrument holding fixture: Ø 8 mm, 6 mm, 3/8 inch and dovetail



550110 6400

### Fine adjustment on the measuring instrument holding fixture

Model	L1 mm	D1 mm	L2 mm	D2 mm	Magnetic foot L x W x H mm	Retaining force N	Magnetic foot thread	art.no.	€
PH 6400	203	14	185	12	60 x 50 x 55	800	M 8	550110 6400	85,30
PH 6600	260	16	225	16	75 x 50 x 55	1000	M 8	550110 6600	139,50
PH 6800	350	18	225	16	120 x 50 x 55	1300	M 10 x 1.25	550110 6800	167,50
								5149	

### Fine adjustment on magnetic base

Model	L1 mm	D1 mm	L2 mm	D2 mm	Magnetic foot L x W x H mm	Retaining force N	Magnetic foot thread	art.no.	€
PH3100	120	10	110	8	40 x 30 x 35	320	M 5	550110 3100	55,80
PH2040	203	14	185	12	60 x 50 x 55	800	M 8	550110 2040	86,30
PH4016	260	16	225	16	75 x 50 x 55	1000	M 8	550110 4016	139,50
								5149	

### Measuring stand w/o base, fine adjustment – measuring instrument holding fixture

- Measuring instrument holding fixture: Ø 8 mm, 6 mm, 3/8 inch and dovetail

Model	L1 mm	D1 mm	L2 mm	D2 mm	Magnetic foot thread	art.no.	€
PH 6410	203	14	185	12	M 8	550110 6401	75,80
PH 6610	260	16	225	16	M 8	550110 6610	116,50
PH 6810	350	18	225	16	M 10 x 1.25	550110 6810	123,50
						5149	



550110 2040

550110 6611

## VOGA Magnetic measuring stands

- For quick and precise positioning of dial indicators
- **With mechanical central clamping mechanism**
- Improved fine adjustment on the magnetic base
- Strong, switchable magnetic base
- Universal holding fixture for common dial indicators
- Robust arm system with central clamping mechanism



Arm mechanism

### Complete stand with fine adjustment on the measuring instrument holding fixture

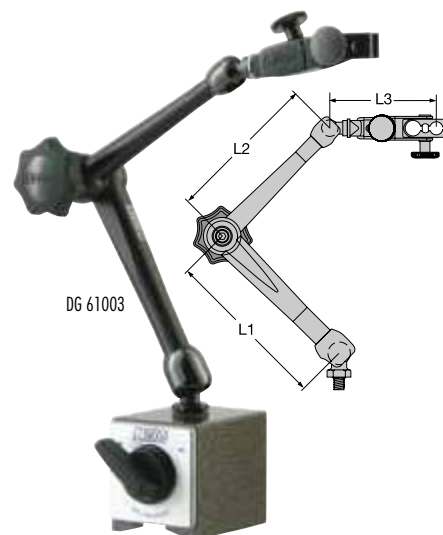
- Measuring instrument holding fixture: Ø 8 mm, 6 mm, 3/8 inch and dovetail

Model	L1 mm	L2 mm	L3 mm	Magnetic foot L x W x H mm	Retaining force N	Magnetic foot thread	art.no.	€
NF 61003	56	51	71	40 x 30 x 35	320	M 5	550501 1001	133,50
DG 61003	110	101	71	60 x 50 x 55	800	M 8	550501 2001	189,-
MG 61003	133	113	71	60 x 50 x 55	800	M 8	550501 3001	210,-
MA 61003	287	223	71	120 x 50 x 55	1300	M 10 x 1.25	550501 4001	415,-



Fine adjustment holding fixture

Fine adjustment magnetic foot



DG 61003

5149

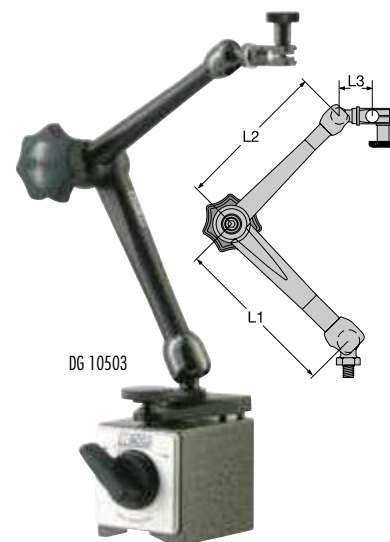
### Complete stand with fine adjustment on magnetic foot

- Ø 8 mm and dovetail holding fixture for measuring instruments

Model	L1 mm	L2 mm	L3 mm	Magnetic foot L x W x H mm	Retaining force N	Magnetic foot thread	art.no.	€
NF 10403	56	51	21.5	40 x 30 x 35	320	M 5	550501 1101	109,50
DG 10503	110	101	21.5	60 x 50 x 55	800	M 8	550501 2101	141,50
MG 10503	133	113	21.5	60 x 50 x 55	800	M 8	550501 3101	164,50



Fine adjustment magnetic foot



DG 10503

5149



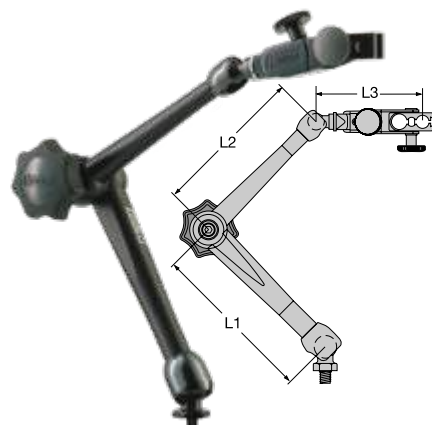
Fine adjustment holding fixture

### Articulated stand without base, fine adjustment to the measuring instrument holding fixture

- Measuring instrument holding fixture: Ø 8 mm, 6 mm, 3/8 inch and dovetail

Model	L1 mm	L2 mm	L3 mm	Magnetic foot thread	art.no.	€
NF 60103	56	51	71	M 5	550501 1010	122,50
DG 60103	110	101	71	M 8	550501 2010	155,50
MG 60103	133	113	71	M 8	550501 3110	194,50
MA 60103	287	223	71	M 10 x 1.25	550501 4010	380,-

5149



## NOGA Feet for measuring stands

- Magnetic feet with high holding force on the V-shaped base and flat rear side
- All contact faces finely ground.
- DG 0040 vacuum base
- Sturdy lightweight metal design with integrated membrane for suction clamping on any level, non-porous and grease-free surface (e.g. granite plates).



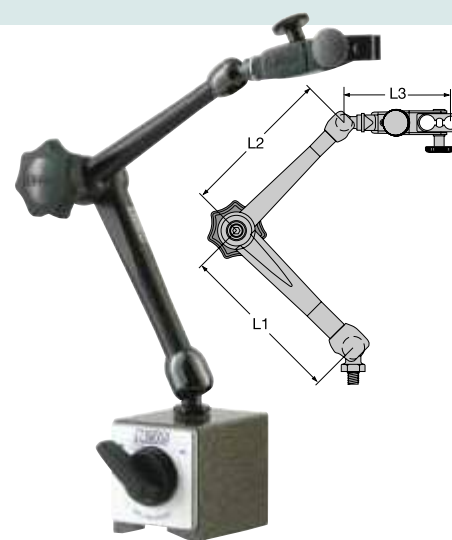
Model	Description	Dimensions L x W x H mm	Retaining force N	Connection thread	art.no.	€
NF 0037	Switchable magnetic foot	40 x 30 x 35	320	M 5	550505 0037	28,30
NF 3778	Switchable magnetic foot with fine adjustment	40 x 30 x 35	320	M 5	550505 0031	32,60
DG 0036	Switchable magnetic foot	60 x 50 x 55	800	M 8	550505 0010	32,-
DG 3678	Switchable magnetic foot with fine adjustment	60 x 50 x 55	800	M 8	550505 0011	35,80
DG 0038	Switchable magnetic foot	75 x 50 x 55	1000	M 8	550505 0012	48,30
DG 0118	Switchable magnetic foot with fine adjustment	75 x 50 x 55	1000	M 8	550505 0118	88,-
DG 0039	Switchable magnetic foot	120 x 50 x 55	1300	M 10 x 1.25	550505 0020	73,10
DG 1003	Switchable magnetic foot	75 x 50 x 67	1000	M 6 / 8 / 10 / 10x1.25 / 12	550505 1003	74,30
DG 0040	Vacuum foot	∅ 92 x 22	350	M 8	550505 0040	66,80

5149

## NOGA Magnetic measuring stand set



- Measuring stand with dial indicator and magnetic base
- Dial indicator:
  - 10 mm measurement range
  - 0.01 mm resolution
  - Accuracy DIN 878



L1 mm	L2 mm	L3 mm	Magnetic foot L x W x H mm	Retaining force N	art.no.	€
133	113	71	60 x 50 x 55	800	550505 0005	244,-

5149

## ATORN® 3D articulated measurement stand

- For quick and precise positioning of dial indicators
- Maintenance-free mechanical central clamping mechanism
- Strong, switchable magnetic base with V-shaped underside, holds firm in any position!
- Combined dial indicator holding fixture with fine adjustment for dial indicators with a ∅ 8 mm shank and for dial test indicators with a dovetail mount



Total height mm	Action radius mm	Magnetic foot L x W x H mm	Retaining force N	art.no.	€
210	130	34 x 30 x 35	300	550520 0210	202,-
305	200	60 x 50 x 55	750	550520 0305	232,-
385	280	60 x 50 x 55	750	550520 0385	276,-

5189



## ATORN® Magnetic stand with flexible column (gooseneck)

- Particularly suitable for measuring in areas that are difficult to access
- Eccentric lever as a central clamping mechanism
- Tension cable can be retightened
- 6 sleeves, each Ø 17 mm
- Holding magnet with smooth and V-shaped underside
- Combined dial indicator holding fixture with fine adjustment for dial indicators with a Ø 8 mm shank and for dial test indicators with a dovetail mount

Total height mm	Magnetic foot L x W x H mm	Retaining force N	art.no.	€
380	70 x 46 x 65	500	<b>550521</b> 0380	<b>193,50</b>
				5189



## IG Small hydraulic stand with magnetic base

- Particularly suitable for use with levers
- Ideal in confined spaces
- Extra-powerful pot magnet, non-switchable
- Dial indicator holding fixture, Ø 8 mm and dovetail
- **Version:**
  - 1 Hydraulic clamp
  - 2 Dial indicator holding fixture, Ø 8 mm and dovetail
  - 3 Joints, fully movable
  - 4 Fine adjustment on base
  - 5 extra-strong permanent magnet
- central, hydraulic clamping
- Supplied in cardboard packaging

Magnetic foot Ø x H mm	Projection mm	art.no.	€	
35 x 30	150	<b>550505</b> 2000	<b>118,-</b>	
				5150



## IG Hydraulic magnetic measuring stand

- Central hydraulic clamping mechanism
- Fine adjustment
- Clamp force infinitely variable up to the maximum
- Articulated arms can rotate through 360° and swivel through 180°
- Dial indicator holding fixture, Ø 8 mm and dovetail
- **Design:** hydraulic clamp, central joint, ball joints, switchable magnetic foot with V-shaped underside
- Supplied in cardboard packaging, with or without magnetic foot

Designation	Action radius mm	Magnetic foot L x W x H mm	Retaining force N	Magnetic foot thread	art.no.	€
Hydraulic measuring stand with magnetic foot	220	60 x 50 x 55	800	M8	<b>551001</b> 0220	<b>143,50</b>
Hydraulic measuring stand without magnetic foot	220	-	-	-	551001 0221	<b>118,-</b>
Hydraulic measuring stand with magnetic foot	260	60 x 50 x 55	800	M 8	551001 0260	<b>150,50</b>
Hydraulic measuring stand without magnetic foot	260	-	-	-	551001 0261	<b>123,-</b>
Hydraulic measuring stand with magnetic foot	300	60 x 50 x 55	800	M 8	551001 0300	<b>174,-</b>
Hydraulic measuring stand without magnetic foot	300	-	-	-	551001 0301	<b>151,50</b>
Hydraulic measuring stand with magnetic foot	400	80 x 50 x 55	1000	M 10	551001 0400	<b>265,-</b>
Hydraulic measuring stand without magnetic foot	400	-	-	-	551001 0401	<b>209,-</b>
Hydraulic measuring stand with magnetic foot	550	80 x 50 x 55	1000	M10	551001 0550	<b>380,-</b>
Hydraulic measuring stand without magnetic foot	550	-	-	-	551001 0551	<b>322,-</b>

5150



551001 0400



## Mitutoyo Magnetic stand with dial test indicator

0,01 mm



- Powerful pot magnet
- Holding fixture for magnetic stand
- Dial test indicator measurement range 0.8 mm
- Readings: 0.01 mm
- Contact point length 20.9 mm
- Supplied in plastic packaging

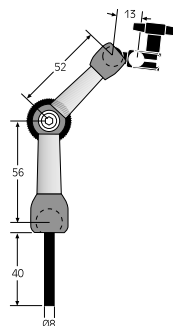


Description	art.no.	€	DAkkS calibration	
			art.no.	€
Magnetic stand with lever dial indicator	525501 0112	140,-	071250 D001	18,-

5102

## WNOGA Articulated stand for dial test indicators

- For precisely positioning and aligning workpieces
- Centring bores
- The stand is clamped directly into the machine chuck by means of a straight clamping shank
- All joints are movable
- All joints fixed by means of a central clamping screw
- Dial indicator holding fixture, Ø 8 mm, with V-block clamp for dial test indicators
- Cylindrical clamping shank (Ø 8 mm, length = 40 mm)



Description	art.no.	€
Articulated stand	550510 0013	91,-
Articulated stand with dial test indicator, measurement range 0.8 mm, 0.01 mm readings, sensor tip length 20.9 mm	550510 5000	188,50

5149

## SARA® Measuring table

- Special cast iron base
- Stable measuring column, Ø 22 mm
- Hardened measuring faces
- DIN 876/0

Measuring height mm	Measuring table mm	Projection mm	Weight kg	art.no.	€
100	Ø 50	50	2.0	552506 5050	213,-
100	70 x 60	75	3.5	552506 5070	280,-

5151



## Mitutoyo Measuring table

- Robust cast iron base
- Dial indicator locating bore  $\varnothing$  8 mm
- Fine adjustment of dial indicator holding fixture: 1 mm
- Column hardened and precision-ground,  $\varnothing$  40 mm
- Total height 389 mm
- Measuring table ground and lapped

Measuring height mm	Measuring table mm	Projection of lateral arm mm	Weight kg	art.no.	€
200	110 x 110	75	12.5	<b>552510 0200</b>	<b>560,-</b>
5102					



## NOGA Measuring table with universal measuring stand

**NEW**

- Measuring table base made of black natural granite
- Universal holding fixture for common dial indicators
- Robust arm mechanism with three-point system
- Column  $\varnothing$  16 mm
- $\varnothing$  8 mm holding fixture for measuring instruments

Measuring area mm	Measuring height mm	Projection mm	art.no.	€
200 x 150	180	230	<b>553003 0001</b>	<b>336,-</b>
5149				



## ATORN® Precision measuring table with granite base

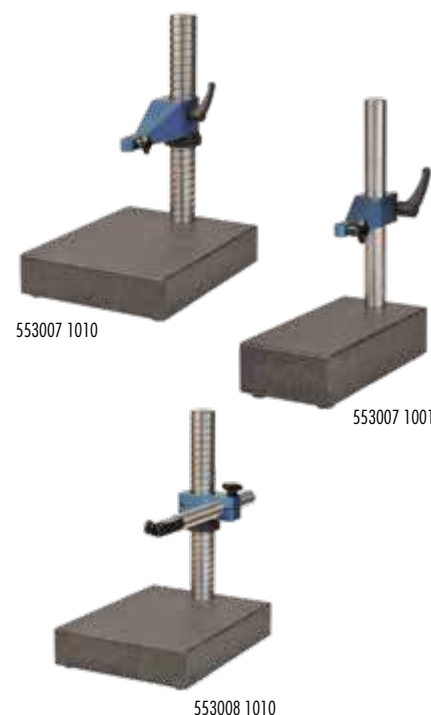
- Measuring table base made of black natural granite
- Precision-lapped measuring area
- Stable column
- Height adjustment with and without helical thread with adjusting ring
- Dial indicator locating bore  $\varnothing$  8 mm

### Fixed measuring arm

Measuring area mm	Measuring height mm	Projection mm	Column $\varnothing$ mm	Design	art.no.	€
200x100	180	60	22	Smooth column	<b>553007 1001</b>	<b>259,-</b>
250x200	210	120	35	Smooth column	553007 1002	<b>365,-</b>
250x200	210	120	35	Column with helical thread	553007 1010	<b>509,-</b>
5153						

### Adjustable measuring arm

Measuring area mm	Measuring height mm	Projection mm	Column $\varnothing$ mm	Design	art.no.	€
250x200	230	200	35	Smooth column	<b>553008 1001</b>	<b>450,-</b>
250x200	230	200	35	Column with helical thread	553008 1010	<b>495,-</b>
5153						



## ATORN® Universal measuring table with 3D articulated stand

**DIN  
876/0**

- Black natural granite measuring table
- Measuring area diamond-lapped to a precision finish
- Articulated stand for quick and precise positioning of dial indicators
- Robust arm system with **mechanical central clamping mechanism**
- Universal dial indicator holding fixture with fine adjustment for all common dial indicators

Measuring area mm	Action radius mm	art.no.	€
400x250	285	553020 0001	320,-
400x400	375	553020 0002	539,-

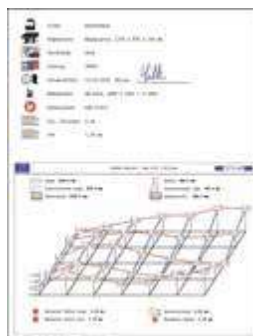
5153



553020 0001

## ATORN® Measuring and inspection plates

- **Accuracy in accordance with DIN 876/0**
- Completely non-warping, tension-free, non-corrosive and acid-resistant
- Non-magnetic and non-conductive, with no temperature sensitivity due to a low thermal expansion coefficient
- Hard and wear-resistant: Hardness grade 6 - 7 on the Mohs scale.
- Homogenous fine-pored material structure results in consistent hardness, which prolongs service life and maintains accuracy
- Maintenance-free; only dirt removal is required to prevent measurement accuracy from becoming impaired
- High contact area ratio due to diamond-lapped measuring faces
- All measuring and inspection plates are supplied
- with a manufacturer's test certificate
- DKD certificate available on request
- Prices ex works, including packaging



**Manufacturer's test  
certificate included**

**All prices are ex works and  
include packaging!**

### Measuring and inspection plates

- Without steel ball inserts

L mm	B mm	H mm	Weight kg	Planarity µm	art.no.	€
400	400	50	25	6	554011 0400	385,-
630	400	70	53	7	554011 0630	549,-

5153



### Measuring and inspection plates with underframes

- Underframe made of profile tubing, with bearing fitting
- Designed for working height approx. 900 mm (plate upper edge)

L mm	B mm	H mm	Weight kg	Planarity µm	art.no.	€
1000	630	100	203	8	554012 1000	1.779,-
1200	800	160	495	9	554012 1200	2.199,-

5153



### Measuring and inspection plates with base cabinets

- Sheet steel base cabinet (sturdy construction)
- 3 fully opening drawers, lockable
- Drawer height 120, 150 and 240 mm
- Load capacity per drawer: 100 kg
- Working height approx. 900 mm
- Measuring plate can be aligned by means of adjustable bearing fittings

L mm	B mm	H mm	Weight kg	Planarity µm	art.no.	€
1000	630	100	330	8	554015 1000	2.589,-
1200	800	160	640	9	554015 1200	3.049,-

5153



## Measuring and inspection plates

- Accuracy in accordance with DIN 876
- Completely non-warping, tension-free, non-corrosive and acid-resistant
- Non-magnetic and non-conductive, with no temperature sensitivity due to a low thermal expansion coefficient
- Hard and wear-resistant: Hardness grade 6 - 7 on the Mohs scale.
- High contact area ratio due to diamond-lapped measuring face
- Plates are supported at structurally predetermined points by steel ball inserts that are fixed to the underside of the plate
- Supplied with steel ball inserts (250 x 250 mm plate without steel ball inserts) and manufacturer's test certificate
- Prices ex works, excluding packaging

**Manufacturer's test certificate included**



L mm	B mm	H mm	Weight kg	Planarity DIN 876/0 μm	Planarity DIN 876/1 μm	DIN 876/0		DIN 876/1	
						art.no.	€	art.no.	€
250	250	50	10	5	13	554002 0001	128,50	554006 0001	115,-
400	250	50	15	6	14	554002 0002	234,-	554006 0002	234,-
400	400	50	25	6	14	554002 0003	290,-	554006 0003	260,-
500	400	90	55	6	15	554002 0004	380,-	554006 0004	341,-
600	500	100	90	6	16	554002 0005	519,-	554006 0005	465,-
630	400	70	50	7	17	554002 0006	460,-	554006 0006	420,-
630	630	70	80	7	17	554002 0007	559,-	554006 0007	509,-
800	600	120	175	7	18	554002 0008	769,-	554006 0008	699,-
1000	630	100	175	8	20	554002 0009	879,-	554006 0009	789,-
1000	630	140	250	8	20	554002 0010	979,-	554006 0010	889,-
1000	800	140	320	8	20	554002 0011	1.209,-	554006 0011	1.099,-
1000	1000	100	280	8	20	554002 0012	1.349,-	554006 0012	1.209,-
1000	1000	160	480	8	20	554002 0013	1.479,-	554006 0013	1.349,-
1200	800	160	450	9	22	554002 0014	1.479,-	554006 0014	1.349,-
1200	1000	160	530	9	22	554002 0015	1.989,-	554006 0015	1.789,-
1500	1000	190	855	10	25	554002 0016	2.629,-	554006 0016	2.369,-
1600	1000	160	720	11	26	554002 0017	2.629,-	554006 0017	2.369,-
2000	1000	220	1320	12	30	554002 0018	3.269,-	554006 0018	2.939,-
						5152		5152	

## Base units for measuring and inspection plates

**Additional accessories for measuring and inspection plates (e.g. individual supports, clamping T-slots or pairs of tailstocks) are available on request**



Tailstock pair on plate with steel T-slot rail design B



Granite base with 5 T-slot rails (special version)



### Profiled tube underframe

- Robust welded structure of profiled tubing designed for a working height of approx. 900 mm (plate upper edge)
- Supplied with bearing fittings, shipped in disposable packaging
- Prices ex works, excluding packaging

for plate size mm	Weight kg	art.no.	€
400 x 400 x 50	23	554025 0003	255,-
500 x 400 x 90	24	554025 0004	260,-
600 x 500 x 100	26	554025 0005	270,-
630 x 400 x 70	25	554025 0006	265,-
630 x 630 x 70	26	554025 0007	270,-
800 x 600 x 120	30	554025 0008	295,-
1000 x 630 x 100	35	554025 0009	306,-
1000 x 630 x 140	35	554025 0010	306,-

5152

for plate size mm	Weight kg	art.no.	€
1000 x 800 x 140	37	554025 0011	321,-
1000 x 1000 x 100	45	554025 0012	399,-
1000 x 1000 x 160	45	554025 0013	399,-
1200 x 800 x 160	45	554025 0014	399,-
1200 x 1000 x 160	50	554025 0015	410,-
1500 x 1000 x 190	55	554025 0016	420,-
1600 x 1000 x 160	56	554025 0017	420,-
2000 x 1000 x 220	60	554025 0018	465,-

5152



**Tool cabinet**

- Made from iron angle brackets clad with steel sheeting, painted silver grey
- Working height approx. 900 mm (plate upper edge)
- Drawers mounted on roller bearings
- Removable shelf
- Lockable doors
- Shipped in disposable packaging
- Prices ex works, excluding packaging

for plate size mm	Design	Weight kg	art.no.	€
630 x 400 x 70	1 door, 1 shelf	40	<b>554030 0006</b>	<b>519,-</b>
630 x 630 x 70	1 door, 1 shelf	42	554030 0007	549,-
800 x 600 x 120	1 door, 1 shelf	53	554030 0008	549,-
1000 x 630 x 100	2 doors, 1 drawer, 1 shelf	60	554030 0009	649,-
1000 x 630 x 140	2 doors, 1 drawer, 1 shelf	60	554030 0010	649,-
1000 x 800 x 140	2 doors, 1 drawer, 1 shelf	63	554030 0011	649,-
1000 x 1000 x 100	2 doors, 1 drawer, 1 shelf	85	554030 0012	689,-
1000 x 1000 x 160	2 doors, 1 drawer, 1 shelf	85	554030 0013	689,-
1200 x 800 x 160	2 doors, 1 drawer, 1 shelf	85	554030 0014	729,-
1200 x 1000 x 160	2 doors, 1 drawer, 1 shelf	95	554030 0015	729,-
1500 x 1000 x 190	2 doors, 1 drawer, 1 shelf	103	554030 0016	839,-
1600 x 1000 x 160	2 doors, 1 drawer, 1 shelf	105	554030 0017	839,-
2000 x 1000 x 220	3 doors, 2 drawers, 1 shelf	120	554030 0018	929,-

5152

**Granite cleaning products****• Cleaning spray**

- For the simple cleaning of granite parts

**• Care spray**

- Specially formulated for maintaining granite components
- Perfect cleaning and long-lasting seal
- Protects surfaces against oxidation and wear
- Allows accessories to be easily moved on the granite surface

Description	Contents	art.no.	€
Cleaning spray	500 ml	<b>554010 0501</b>	<b>45,30</b>
Cleaning spray	500 ml	554010 0505	19,25

5152



554010 0505

**ATORN® Measuring angle****• 90°**

- Triangular shape, made from the finest black natural granite
- Hard and wear-resistant
- Precisely finished on both sides
- With weight-reducing bores from size O600
- Surface accuracy of both angled faces in accordance with DIN 876
- Perpendicularity in accordance with DIN 875, accuracy 00
- Shipped in disposable packaging
- Prices ex works, including packaging

Limb length	Width mm	Perpendicularity mm	Weight kg	art.no.	€
200 x 150 mm	50	0.002	2	<b>555501 0200</b>	<b>305,-</b>
300 x 200 mm	50	0.002	5	555501 0300	470,-
400 x 250 mm	50	0.003	10	555501 0400	829,-
500 x 300 mm	60	0.004	15	555501 0500	1.039,-
600 x 400 mm	70	0.005	30	555501 0600	1.579,-
800 x 500 mm	80	0.006	55	555501 0800	2.539,-

5153

**Packaging costs  
included**

555501 0600

## Concentricity gauge

- For testing the radial and axial run-out accuracy of rotating parts
- Size 0350 tailstocks with V-block attachments

### Base plate design:

- Special cast iron
- Finely ground supporting surface
- With 2 T-slots, for holding tailstocks and measuring stand
- Slot width 10 mm (12 mm\*)
- Distance between T-slots 58 mm (100 mm\*)
- Planarity in accordance with DIN 876/2

### Tailstock design:

- Adjustable
- Left-hand tailstock with fixed tip, right-hand tailstock with movable tip
- Quill  $\varnothing$  16 mm (22 mm\*)
- Movable tip travel approx. 10 mm
- Hardened steel quill and centre, precision-ground

### Measuring stand design:

- With fine adjustment
- Locating bore 8H7
- Column  $\varnothing$  and height: 16 x 200 mm (22 x 240 mm\*)
- Cross-arm  $\varnothing$  and length: 16 x 60 mm (16 x 125 mm\*)
- Base plate supplied with tailstocks and measuring stand

\* Values in brackets are for concentricity gauge no. 5547600450



554760 0200

Base plate L x W mm	Point width mm	Point height mm	Weight kg	art.no.	€
350 x 110	200	50	8	554760 0200	619,-
500 x 110	350	75	12	554760 0350	809,-
700 x 180	450	100	35	554760 0450	2.019,-

5154



554761 0001



554761 0003



554761 0011

### Accessories

Designation	Diameter range mm	suitable for	art.no.	€
V-block inserts	3-15	554760 0200 / 0350	554761 0001	111,-
V-block jacks	5-25	554760 0200 / 0350	554761 0002	203,-
Roller jacks	3-30	554760 0200 / 0350	554761 0003	196,50
V-block inserts	8-45	554760 0450	554761 0010	141,50
V-block jacks	5-50	554760 0450	554761 0011	280,-
Roller jacks	4-60	554760 0450	554761 0012	266,-

5154

## Special measuring jobs

INFO

Please contact us!





## V-block pair



- With clamp
- Hardened
- Ground outer edges
- V-block accuracy: 0.005 mm to the standing surface
- Prices per pair

L mm	Width mm	Height mm	max. clamp Ø mm	art.no.	€
45	40	35	25	<b>556002 0040</b>	<b>77,70</b>
70	45	41	40	556002 0045	<b>112,50</b>

5155



## ATORN® Double V-block pair

- Indent 90° with clamp
- Hardened
- V-block and clamping surfaces level, machined in parallel, finely ground and adjusted
- V-block accuracy: 0.004 mm to the base surface
- Stainless steel version available on request

L mm	Width mm	Height mm	Clamp Ø mm	art.no.	€
50	40	40	5-30	<b>556006 0031</b>	<b>154,50</b>
75	55	55	5-50	556006 0051	<b>232,-</b>
100	75	75	7-70	556006 0071	<b>346,-</b>

5189



### Individual parts

Designation	art.no.	€
V-block, Ø 5-30, individual with clamp	<b>556008 0031</b>	<b>80,90</b>
V-block, Ø 5-50, individual with clamp	556008 0051	<b>122,-</b>
V-block, Ø 7-70, individual with clamp	556008 0071	<b>187,50</b>
Clamp, Ø 5-30, individual	556008 1031	<b>30,30</b>
Clamp, Ø 5-50, individual	556008 1051	<b>31,80</b>
Clamp, Ø 7-70, individual	556008 1071	<b>38,-</b>

5189

## ATORN® Magnetic measuring and clamping V-block

- Steel
- 90° recess
- Level, parallel and perpendicular finish
- Magnetic force can be switched on/off
- Magnetic holding surface on the side opposite the switch
- Planarity and parallelism tolerance 0.004 mm,  
Perpendicularity tolerance 0.01 mm
- Supplied in a case

L mm	Width mm	Height mm	Clamp Ø mm	Retention force round N	Retention force surface N	art.no.	€
80	67	96	6-66	400	900	<b>556018 0080</b>	<b>390,-</b>
100	70	96	6-70	400	1800	556018 0100	<b>549,-</b>

5189



### Hardened finish

L mm	Width mm	Height mm	Clamp Ø mm	Retention force round N	Retention force surface N	art.no.	€
70	45	70	2-40	300	600	<b>556019 0070</b>	<b>395,-</b>
80	67	96	6-66	400	900	556019 0080	<b>470,-</b>
100	70	96	6-70	400	1800	556019 0100	<b>689,-</b>

5189

## Parallels

- **Pair, with four 90° V-recesses**
- Made from high-density special cast iron with high wear-resistance; all four supporting surfaces and V-recesses finished in pairs to the same height; supporting surfaces and V-recesses precision ground; lateral faces planed
- **Grade 1:** V-recesses in the base surface, accuracy: 0.016 mm
- Supplied in pairs, in disposable packaging



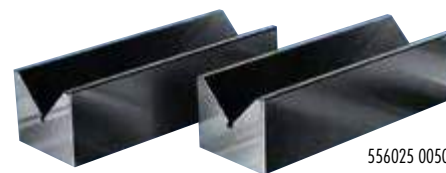
556010 0120

L mm	Width mm	Height mm	Weight kg	Shaft Ø mm	art.no.	€
60	100	120	7	8-90	<b>556010 0090</b>	<b>326,-</b>
75	130	150	13	10-120	556010 0120	<b>480,-</b>
90	170	200	24	12-180	556010 0180	<b>769,-</b>

5155

## V-block pair with 90° recess

- Made from high-density special cast iron with high wear-resistance, V-recesses finished in pairs to the same height, lateral faces planed
- **Grade 3:**  
Supporting surfaces and V-recesses finely planed, parallelism between support and V-block, accuracy: 0.06 mm
- **Grade 1:**  
Supporting surfaces and V-recesses finely planed, parallelism between support and V-block, accuracy: 0.016 mm



556025 0050

L mm	Width mm	Shaft Ø mm	Grade 3		Grade 1	
			art.no.	€	art.no.	€
100	40	6-40	<b>556020 0040</b>	<b>70,20</b>	<b>556025 0040</b>	<b>104,-</b>
150	50	8-50	556020 0050	<b>113,-</b>	556025 0050	<b>159,-</b>
200	70	8-70	556020 0070	<b>193,-</b>	556025 0070	<b>253,-</b>
250	85	12-85	556020 0085	<b>355,-</b>	556025 0085	<b>509,-</b>
300	100	12-100	556020 0100	<b>475,-</b>	556025 0100	<b>699,-</b>

5155

5155

## Angle plate

- With clamping slots, precisely machined on both sides
- Angle precision in accordance with DIN 875 (clamping surface support)
- Made of high-density special casting with high wear-resistance, supporting surface and clamping surface machined at angles to one another, planed lateral faces, cast clamping slots,
- **Quality 3:** Bearing and clamping surface finish planed, planarity according to DIN 876/3
- **Quality 1:** Bearing and clamping surface ground, planarity according to DIN 876/2
- **Quality 0:** Supporting and clamping surface precision-ground, planarity in accordance with DIN 876/1



556035 0004

### Grade 3

Dimensions L x W x H mm	Slot width mm	Weight kg	Angularity mm	art.no.	€
150 x 75 x 100	16	4	0.030	<b>556030 0001</b>	<b>139,50</b>
200 x 100 x 150	16	8	0.030	556030 0002	<b>188,50</b>
275 x 150 x 200	20	20	0.040	556030 0003	<b>355,-</b>
400 x 225 x 300	24	45	0.050	556030 0004	<b>609,-</b>
500 x 300 x 400	24	85	0.060	556030 0005	<b>979,-</b>

5155

### Grade 1

Dimensions L x W x H mm	Slot width mm	Weight kg	Angularity mm	art.no.	€
150 x 75 x 100	16	4	0.015	<b>556035 0001</b>	<b>214,-</b>
200 x 100 x 150	16	8	0.015	556035 0002	<b>336,-</b>
275 x 150 x 200	20	20	0.020	556035 0003	<b>529,-</b>
400 x 225 x 300	24	45	0.025	556035 0004	<b>1.019,-</b>
500 x 300 x 400	24	85	0.030	556035 0005	<b>1.539,-</b>

5155

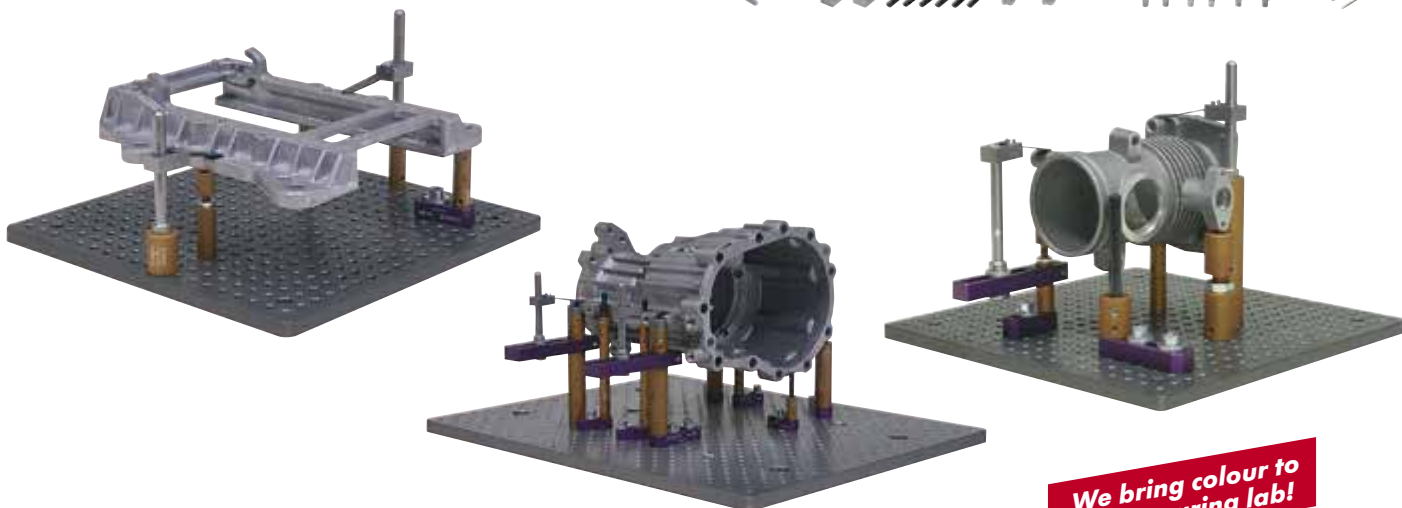
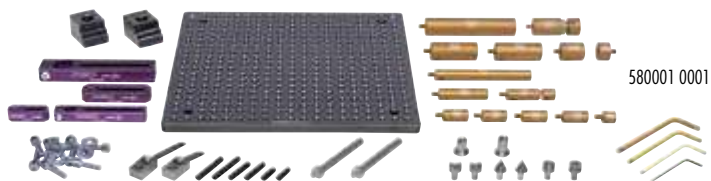
### Grade 0

Dimensions L x W x H mm	Slot width mm	Weight kg	Angularity mm	art.no.	€
150 x 75 x 100	16	4	0.007	<b>556037 0001</b>	<b>326,-</b>
200 x 100 x 150	16	8	0.007	556037 0002	<b>455,-</b>
275 x 150 x 200	20	20	0.009	556037 0003	<b>739,-</b>
400 x 225 x 300	24	45	0.011	556037 0004	<b>1.599,-</b>
500 x 300 x 400	24	85	0.013	556037 0005	<b>2.549,-</b>

5155

## Mitutoyo Clamping system for coordinate metrology ECO-FIX

- Assembly kits for immediate use
- Cost-effective
- Extremely easy to handle
- No fasteners required
- Quick assembly
- Compatible with leading manufacturers' products, no adapter required
- We will be happy to provide a list of the set contents on request



Description	Hole distance mm	art.no.	€
ECO-FIX assembly kit S, 60-piece, base plate 250 x 250 mm	12.5	580001 0001	940,-
ECO-FIX assembly kit L, 99-piece, base plate 500 x 400 mm	25.0	580001 0005	1.752,-

5107

## ATORN® Mini precision vices

- For mounting and positioning small parts on projectors, measuring microscopes or during roughness measurements
- Replaceable clamping jaws with ground horizontal and vertical V-blocks
- Angle precision 0.01 mm
- Parallelism 0.01 mm

*Ideal for use with measuring microscopes and measuring projectors*

Type	Jaw width mm	Dimensions L x W x H mm	Clamping width mm	Clamping depth mm	Material	art.no.	€
Size 1	15	50x15x15	14	8	Brass	565006 0015	124,50
Size 2	25	75x25x25	23	15	Aluminium	565006 0025	157,-
Size 3	35	100x35x35	35	35	Aluminium	565006 0035	199,50

5192



### Complete set

- One vice in each size (Size 1/2/3), including 1 base jaw and 1 V-block jaw
- 1 pair of plastic jaws each (15 / 25 / 35 mm jaw width)
- 1 pair of stepped jaws each (15 / 25 / 35 mm jaw width)
- 1 pair of prism jaws with positioning pin (15 / 25 / 35 mm jaw width)
- 1 Midi divider (Ø 1.2-6.0 mm) and 1 Mini divider (Ø 0.4-3.5 mm)
- 2 bench vice stands
- 3 holding plates including screws
- 1 pair of double V blocks with clamp, 25 x 20 x 20 mm, clamping range 2-15 mm
- 4 pin wrenches
- Supplied in a sturdy carry case

Description	art.no.	€
Size 1 to Size 3 and accessories	565006 1005	1.389,-

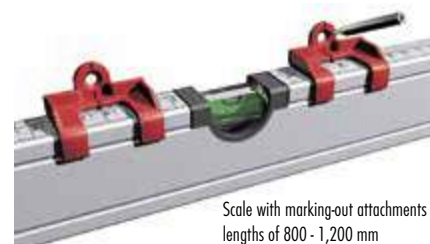
5192



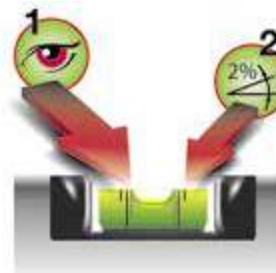
## ATORN® Light metal spirit level

**• With and without magnet**

- Strong aluminium rectangular profile
- Non-slip contact due to silicon pads on rear
- Rubber end caps act as shock absorbers
- Laser-marked round horizontal vial
- Precision readings due to additional markers for the zero position and 2% gradients
- Magnifying effect for improved readability
- 270° vial viewing angle without protruding edges
- Vials made from high-strength, unbreakable polycarbonate
- Measurement accuracy in normal position: 0.5 mm/m
- 556508.... Lengths 800 to 1200 mm with additional scale on the upper measuring face and 2 adjustable measuring and scribing attachments
- 556509.... with magnetic sole



Scale with marking-out attachments for lengths of 800 - 1,200 mm



Precision readings



Non-slip silicon pads

L mm	art.no.	€	With magnet	
			art.no.	€
200	556508 0200	25,-		
300	556508 0300	26,60		
400	556508 0400	30,80	556509 0400	47,70
500	556508 0500	32,40		
600	556508 0600	34,10	556509 0600	52,90
800	556508 0800	39,90	556509 0800	68,50
1000	556508 1000	44,90	556509 1000	76,80
1200	556508 1200	49,40		
1500	556508 1500	64,30		
1800	556508 1800	78,90		
2000	556508 2000	79,90		
	5179		5179	

## ATORN® Electronic inclinometer

- Made from thick-walled four-chamber hollow aluminium profile, cross-section 60 x 26 mm, with two milled measuring faces
- Impact-resistant protective ends
- Display can be switched between degrees, percent or millimetres/metre
- HOLD function (measurement value memory)
- Switchable acoustic signal for 0° or 90° position
- Easy to read thanks to high-contrast 16 mm high LCD display
- Arrows in the display indicate the direction in which the device should be moved to reach the 0° or 90° position
- Display flips automatically for overhead readings
- Error margins:  
at 0° to 90° = 0.05°  
at 1° to 89° = 0.2°
- Extremely easy horizontal and vertical adjustment using the integrated measurement computer
- Battery life approx. 300 hours
- Supplied in sturdy plastic tubing with 6LR61 battery, no. 548079 4022



Total length mm	Length of the test face mm	Measurement range	Numerical intervals/ sensitivity	art.no.	€	DAkkS calibration art.no.	€
256	230	4x90°	0.1° / 0.1% / 1 mm/m	556540 2001	244,-	075008 D004	86,-

5158

## Inclinometer

- For measuring planarity, perpendicularity and angularity
- **Digital display**
- Precision supporting surface in an aluminium frame with V on one side
- Display flips automatically when rotated through 180°
- Accuracy: Factory standard  
Power supply: 9 V battery  
Operating temperature: -5°C to 50°C  
Dimensions: 153 x 49 x 31 mm  
Weight: 300 g
- Supplied in a case with 6LR61 battery, no. 548079 4022



556535 2001

Model	Measurement range	Numerical intervals/sensitivity	Error limit mm	Repetition precision	art.no.	€	DAkkS calibration art.no.	€
Pro 360	360° (4 x 90°)	0.1°	0.1° horizontal, 0.2° vertical	±0.1°	556535 2001	370,-	075008 D004	86,-
Pro 3600	360° (4 x 90°)	0.01° (0° to 9.99°) 0.1° (10° to 90°)	0.05° (0° to 10°) 0.2° (10° to 80°) 0.1° (80° to 90°)	±0.05°	556535 2002	609,-	075008 D004	86,-

5158

## SARA® Digital inclinometer

- Robust metal casing
- With 2 magnets on the bottom and side surfaces
- rotating display
- Supplied with 6LR61 battery, no. 548079 4022

Measurement range	Numerical intervals/sensitivity	Dimensions L x W x H mm	art.no.	€
360° (4 x 90°)	0.05°	57 x 57 x 31	<b>556550</b> 0001	<b>54,50</b>
				5158



## Precision spirit level

DIN 877



- For aligning horizontal and vertical surfaces and shafts
- Base body made from high-quality special cast iron
- Flat and 150° V-shaped underside, finely ground
- Finely ground supporting surface and front faces
- Longitudinal and transverse vials made from acrylic glass
- No recalibration necessary due to tension-free vial installation
- Fully insulated against heat from hands and breath
- Recesses in the housing permit side view of the vial
- Supplied in a plastic case



556524 0160

L mm	0,3 mm/m		DAkkS calibration	
	art.no.	€	art.no.	€
160	<b>556521</b> 0160	<b>158,-</b>	075008 D006	<b>68,-</b>
200	556521 0200	<b>182,50</b>	075008 D006	<b>68,-</b>
250	556521 0250	<b>204,-</b>	075008 D006	<b>68,-</b>
300	556521 0300	<b>219,-</b>	075008 D006	<b>68,-</b>
5157				

L mm	0,1 mm/m		DAkkS calibration	
	art.no.	€	art.no.	€
160	<b>556522</b> 0160	<b>170,-</b>	075008 D005	<b>76,-</b>
200	556522 0200	<b>201,-</b>	075008 D005	<b>76,-</b>
250	556522 0250	<b>219,-</b>	075008 D005	<b>76,-</b>
300	556522 0300	<b>245,-</b>	075008 D005	<b>76,-</b>
5157				

L mm	0,04 mm/m		DAkkS calibration	
	art.no.	€	art.no.	€
160	<b>556523</b> 0160	<b>234,-</b>	075008 D004	<b>86,-</b>
200	556523 0200	<b>270,-</b>	075008 D004	<b>86,-</b>
250	556523 0250	<b>316,-</b>	075008 D004	<b>86,-</b>
300	556523 0300	<b>355,-</b>	075008 D004	<b>86,-</b>
5157				

L mm	0,02 mm/m		DAkkS calibration	
	art.no.	€	art.no.	€
160	<b>556524</b> 0160	<b>280,-</b>	075008 D003	<b>96,-</b>
200	556524 0200	<b>331,-</b>	075008 D003	<b>96,-</b>
250	556524 0250	<b>370,-</b>	075008 D003	<b>96,-</b>
300	556524 0300	<b>395,-</b>	075008 D003	<b>96,-</b>
5157				

## Precision frame spirit level

DIN 877



- For aligning horizontal and vertical surfaces and shafts
- Base body made from high-quality special cast iron
- 3 sides V-shaped, 1 side flat, finely ground
- Longitudinal and transverse vials made from acrylic glass
- No recalibration necessary due to tension-free vial installation
- Fully insulated against heat from hands and breath
- Recesses in the casing allow vials to be viewed from the side
- Supplied in a wooden case



556534 0200

L mm	0,3 mm/m		DAkkS calibration	
	art.no.	€	art.no.	€
100	<b>556531</b> 0100	<b>265,-</b>	075008 D006	<b>68,-</b>
150	556531 0150	<b>311,-</b>	075008 D006	<b>68,-</b>
200	556531 0200	<b>375,-</b>	075008 D006	<b>68,-</b>
5157				

L mm	0,1 mm/m		DAkkS calibration	
	art.no.	€	art.no.	€
100	<b>556532</b> 0100	<b>321,-</b>	075008 D005	<b>76,-</b>
150	556532 0150	<b>370,-</b>	075008 D005	<b>76,-</b>
200	556532 0200	<b>450,-</b>	075008 D005	<b>76,-</b>
5157				

L mm	0,04 mm/m		DAkkS calibration	
	art.no.	€	art.no.	€
100	<b>556533</b> 0100	<b>405,-</b>	075008 D004	<b>86,-</b>
150	556533 0150	<b>490,-</b>	075008 D004	<b>86,-</b>
200	556533 0200	<b>589,-</b>	075008 D004	<b>86,-</b>
5157				

L mm	0,02 mm/m		DAkkS calibration	
	art.no.	€	art.no.	€
150	<b>556534</b> 0150	<b>539,-</b>	075008 D003	<b>96,-</b>
200	556534 0200	<b>669,-</b>	075008 D003	<b>96,-</b>
5157				



**TSCHORN** 3D probe



- New and improved model
- Minimised guide play and more stable positioning
- Optimised button mechanism
- For determining the spindle centre when aligning workpieces on X, Y, and Z axes
- To protect the measuring unit, large over-travel allowances have been incorporated into the probe unit
- Probe insert with predetermined break point at the far top
- Probes can be replaced by the user
- Supplied with standard probe insert



Size comparison: standard probe / slim-line probe



Shank Ø mm	L mm	art.no.	€	Factory calibration	
				art.no.	€
12	132.5	<b>558002 0002</b>	<b>274,-</b>	073103 W161	<b>48,-</b>
5198					

**Accessories**

- Suitable for 558002 0002 and 558002 0010

Designation	Ø mm	L mm	Substance	art.no.		€	
Probe insert, long	6	62	Steel	<b>558003 0002</b>		<b>49,20</b>	
Probe insert, standard	3	27	Ceramics	558003 0010		<b>32,50</b>	
5198							



**SARA** 3D probe SAVEplus

- Slim and attractive design
- For determining the spindle centre when aligning workpieces on X, Y, and Z axes
- Adjustable scale
- Probe insert with predetermined break point at the far top
- Probes can be replaced by the user
- Supplied with standard probe insert



Shank Ø mm	L mm	art.no.	€	Factory calibration	
				art.no.	€
12	128	<b>558002 0010</b>	<b>203,-</b>	073103 W161	<b>48,-</b>
5198					



High-gloss polished...

... extremely sharp.

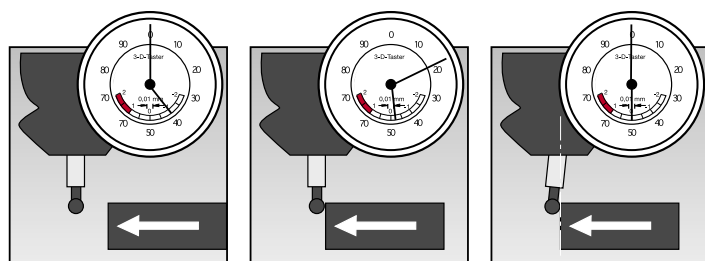
**ATORN**<sup>®</sup>  
Performance demands quality



## ATORN® Universal 3D probe



- For determining the spindle centre when aligning workpieces on X, Y, and Z axes
- Easily readable dial indicator
- True-running accuracy can be calibrated via 4 adjustment screws in the casing
- Robust metal casing
- No plus/minus sign problems, as actual value readings are independent of the direction
- Automatic probe radius compensation
- Ceramic predetermined break point prevents damage to the mechanism if maximum probe displacement is exceeded
- Probes can be replaced by the user
- For use on all machine tools including EDM equipment due to insulation between the probe insert and the holding fixture
- Dial indicator diameter: 57 mm  
Casing width: 65 mm  
Clamping shank: 20 mm Ø x 50 mm, similar to DIN 1835B or DIN 69871A, SK 40  
Probe ball diameter: 4 mm
- Supplied in moulded packaging, including operating manual



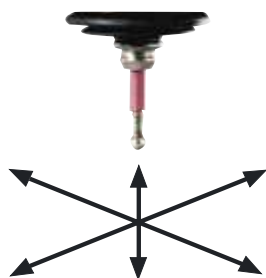
Move towards the workpiece edge

When contact is made with the edge, the display will change

If the small and large pointers are at "zero", the spindle axis and contact edge are exactly in line. The machine control system is zeroed.



558001 0040



558005 0001 558005 0005

Designation	art.no.		Factory calibration	
	art.no.	€	art.no.	€
Universal 3D probe, shank Ø 20 mm	558001 0001	320,-	073103 W161	48,-
Universal 3D probe, shank DIN 69871A, SK 40	558001 0040	440,-	073103 W161	48,-
5159				

### Accessories

Designation	art.no.	€
Spare contact point 4 mm Ø x 33 mm long	558005 0001	39,95
Long contact point 8 mm Ø x 75 mm long	558005 0005	55,90
5183		

## Universal 3D probe, digital



- **Digital display**, otherwise design as order no. 558001....,
- Clamping shank: 20 mm Ø x 50 mm, similar to DIN 1835B or DIN 69871A, SK 40  
Reading: 0.001 mm, mm/inch selection  
Probe ball diameter: 4 mm  
Measurement accuracy: 0.005 mm
- Supplied in moulded packaging, with CR2032 battery (no. 548079 6032) and operating manual

Designation	art.no.		Factory calibration	
	art.no.	€	art.no.	€
Universal 3D probe, digital, shank Ø 20 mm	558001 0005	719,-	073103 W161	48,-
5160				

### Accessories

Designation	art.no.	€
Spare contact point 4 mm Ø x 33 mm long	558005 0001	39,95
Long contact point 8 mm Ø x 75 mm long	558005 0005	55,90
5183		

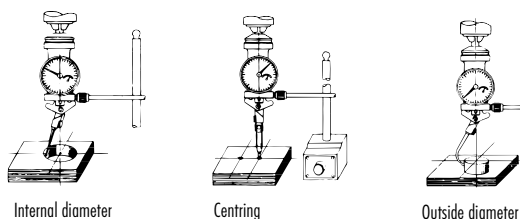


558005 0001 558005 0005

## Precision centring device CO-AX



- For aligning workpieces on machine tools with vertically or horizontally rotating spindles
- Non-rotating, easily readable dial indicator
- Robust metal casing
- Wide display range
- Straight clamping shank  $\varnothing$  10 mm
- With stanchion to hold the dial indicator in the desired position
- Replacement of the probe tips facilitates large working range inside and outside
- Dial indicator diameter  $\varnothing$  40 mm with tolerance marks
- Functional range  $\varnothing$  4-300 mm, inside and outside
- Optimum speed 150<sup>rpm</sup>
- Supplied with stanchion 160 mm, 3 inner probes (50/100/150 mm), 3 outer probes (50/100/150 mm), Centre probe, Wooden storage boxes



Display area mm	Reading mm	art.no.		Factory calibration	
		art.no.	€	art.no.	€
5	0.01	530010 0070	305,-	073103 W162	58,-

5161

## HAIMER® Precision centring device Centro

- For aligning workpieces on machine tools with vertically or horizontally rotating spindles
- Non-rotating, easily readable dial indicator
- Robust metal casing
- Large display range
- Straight clamping shank,  $\varnothing$  16 mm
- With stanchion to hold the dial indicator in the desired position
- Centring accuracy: 0.003 mm
- Casing  $\varnothing$ : 80 mm
- Clamping shank:  $\varnothing$  16 mm x 48 mm
- Dial indicator  $\varnothing$ : 60 mm
- Length (without clamping shank): 92 mm
- Max. Speed: 150 rpm
- Bore measurement range:  $\varnothing$  6 - 125 mm
- Shaft measurement range:  $\varnothing$  0 - 125 mm with bent probe tip
- Base unit supplied with  $\varnothing$  5 mm straight probe insert and telescopic rod featuring an articulated base, in moulded packaging

Designation	art.no.		Factory calibration	
	art.no.	€	art.no.	€
Centring device, shank $\varnothing$ 16 mm	558012 0001	380,-	073103 W162	58,-

5185

### Accessories

Designation	art.no.		€	
	art.no.	€	art.no.	€
Probe insert, straight with ball, $\varnothing$ 5 mm	558014 0001	26,50		
Probe insert, straight with ball, $\varnothing$ 2 mm	558014 0002	29,-		
Probe insert, curved with ball, $\varnothing$ 5 mm	558014 0003	34,10		

5185



Curved probe insert (optional)

## Zero adjuster, height 50 mm

- For setting machine reference points
- The adjustment device is placed on the workpiece and the tool (e.g. milling cutter) moved towards the spring-mounted contact surface until both pointers on the dial indicator are at zero. The lower edge of the tool is now positioned at exactly 50 mm  $\pm$  0.01 mm. The reference dimension of 50 mm is entered into the machine control system.

**Caution:** Process may only be performed while the tool is stationary.

- Base body and probe insert are case-hardened (60 HRC) and finely ground
- Two guide diameters for optimum handling of the contact surface
- 558020 0005: six magnets in the base, plane-ground
- Supplied in a wooden case with dial indicator, operating manual and measurement log

Enclosure $\varnothing$ mm	Sensor surface $\varnothing$ mm	Spring deflection mm	Reading mm	Magnetic foot	art.no.	€
64.5	47	50.5 - 49.5	0.01	No	558020 0001	214,-
64.5	47	50.5 - 49.5	0.01	Yes	558020 0005	264,-

5163



## Zero adjuster, height 100 mm

- Height adjustment dial for determining the position of the workpiece surface on the Z axis
- Can also be used horizontally
- Height tolerance  $\pm$  0.01 mm
- Especially suitable for micro-drills



Height mm	Dimensions mm	Sensor surface $\varnothing$ mm	art.no.	€
100	90 x 48 x 25	10	558021 0001	156,50

5163

## Height adjustment device for lathes

NEW

- For quick and easy determination of the reference point in the lathes
- Suitable for horizontal and vertical use
- Can be used only on electrically conductive materials
- **With illuminated display,** LED indicators with good all-round visibility
- Height tolerance  $\pm$  0.01 mm
- Travel reserve 2 mm
- Hardened probe tip, functional surfaces ground and lapped
- **Base equipped with three magnets for better grip when used horizontally**
- Supplied in wooden box with works certificate incl. 2x SR 44 batteries no. 500534 0001



Height mm	Support surface $\varnothing$ mm	Sensor surface $\varnothing$ mm	art.no.	€
60	32	19	558030 1060	203,-

5162

## Height adjustment device

- For quickly and easily determining the axial reference point for the machine spindle without damaging the workpiece.
- Can only be used on electrically conductive materials.
- **With illuminated display,** LED indicators with good all-round visibility
- Height tolerance  $\pm$  0.01 mm
- Over-travel margin 3 mm
- Hardened probe insert, functional faces ground and lapped
- **With three magnets for better grip**
- Supplied with 2x SR44 batteries, no. 500534 0001



Red lighting all the way around upon contact



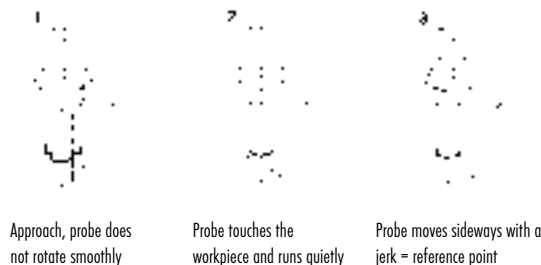
558030 0001

Height mm	Support surface $\varnothing$ mm	Sensor surface $\varnothing$ mm	art.no.	€
50	55	14.0	558030 0001	274,-

5162

## Edge probe for rotary applications

- For determining tool reference faces and edges
- **Recommended speed: approx. 600 rpm**
- All parts hardened and burnished
- Ground clamping and contact diameters
- Surfaces between holding fixture and probe head lapped
- Probe head is connected to the clamping shank via an extension spring
- Alignment accuracy 0.01 mm
- Supplied in a case

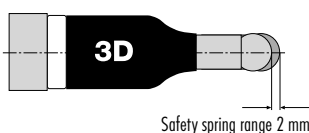
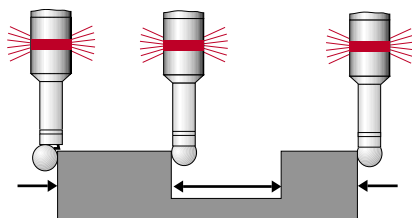
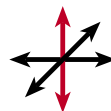


Clamping Ø mm	Contact Ø mm	Total length mm	art.no.	€
10	10 and 4	90	558040 0001	48,80
10	10	84	558040 0002	48,80
6	6	50	558040 0003	48,80

5162

## Edge finder with illuminated display

- For positioning reference points on metallic workpieces
- Two-axis and three-axis measurements available
- Can also be used to determine the centre or diameter of a bore
- The distance from the spindle centre to the contact surface is 5.00 mm
- Can only be used on electrically conductive materials
- True-running accuracy ± 0.01 mm
- Hardened steel body with ground functional surfaces
- LED indicator lamps with good all-round visibility
- Supplied with batteries



### Straight shank, 2D and 3D

- Incl. 1x 23A battery, no. 548079 4223

Clamping shank mm	Total length mm	Sensor ball Ø mm	2D version		3D version	
			art.no.	€	art.no.	€
16	99	10	558062 1016	133,-		
20	94	10	558062 1020	133,-		
20	118	10			558063 3020	171,-

5162

5162

### Morse taper shank, 2D

- Incl. 2x 10GA batteries, no. 548079 4706

Clamping shank	Total length mm	Sensor ball Ø mm	2D version art.no.	€
MT 2	133	10	558060 2002	174,-

5162

### Straight shank, 2D and 3D, with signal tone

- Incl. 1x 23A battery, no. 548079 4223

Clamping shank mm	Total length mm	Sensor ball Ø mm	2D version		3D version	
			art.no.	€	art.no.	€
20	119	10	558064 1020	202,-		
20	131	10			558065 1020	270,-

5162

5162



558062 1016

558063 3020



558060 2002



558064 1020

## SCHWEIZER Hand-held magnifier Tech-Line

- Aplanatic lens system made from scratch-resistant silicate glass
- Large depth of field and high-contrast view
- Low-reflection black lens frame
- Metal or plastic handle with two-component paint, resistant to virtually all chemicals and solvents

Magnification	Lens Ø mm	Handle	art.no.	€
2x/4x	90/20	Plastic	560220 0204	72,70
4x	65	Plastic	560220 0004	56,80
8x	28	Metal	560220 0008	39,10
10x	28	Metal	560220 0010	44,10



5164

## SCHWEIZER Hand-held reading glass

- Chrome-plated brass magnifier head
- High-quality black plastic handle
- Size 0035 high-quality reading glass with bi-convex silicate glass lenses
- Size 0255 high-quality bifocus reading lens with 2 different magnifications

Magnification	Lens Ø mm	art.no.	€
3.5x	65	560124 0035	38,-
2.5x / 5x	75 / 20	560124 0255	48,10



560124 0255

5164

## SCHWEIZER Stand magnifiers and pocket microscope Tech-Line

### Stand magnifiers

- Ideal for all planar tests, as a single stand magnifier or as a measuring magnifier with duo scale
- Fixed focus or vario-focus versions
- Aplanatic silicate glass lens, scratch-proof
- Large depth of field and high-contrast view
- Casing made from shock-proof, transparent plastic
- Insertion guide for effortlessly retrofitting with duo scales

Designation	Magnification	Lens Ø mm	art.no.	€
Fix-Focus	8x	30	560106 0008	31,30
Fix-Focus	10x	30	560106 0010	38,90
Vario-Focus	8x	22.8	560106 1008	43,10
Vario-Focus	10x	22.8	560106 1010	49,30



560106 1008

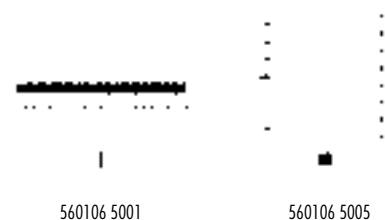
560106 0008

5164

### Duo scales

- Can be used with fixed-focus and vario-focus stand magnifiers, and the pocket microscope in conjunction with a stand adapter
- Two scales (Duo-Scale) on one plate: Ø 25 mm for stand magnifiers 8x and 10x, Ø 2.5 for pocket microscope 40x, 50x and 60x
- Scratch-resistant glass
- Hard chrome scale on the underside to prevent parallax errors

Designation	Display	art.no.	€
Scale 1	Measurement scale 20 mm	560106 5001	43,10
Scale 2	Polar grid, angle, radius	560106 5002	48,30
Scale 3	Angle	560106 5003	48,30
Scale 4	Polar grid	560106 5004	48,30
Scale 5	Thickness	560106 5005	48,30



560106 5001

560106 5005

5164

### Set

- 8x vario-focus stand magnifier plus scales, supplied in an aluminium box

Contents	art.no.	€
Vario-Focus 8x plus scale	560106 5101	89,50
Vario-Focus 8x plus scales 1 to 5	560106 5102	262,-



560106 5102

5164

### LED light unit

- For Fix and Vario-Focus stand magnifiers
- Scratch-resistant casing, resistant to virtually all chemicals and solvents
- Light colour 4500K - neutral white
- Supplied with three LR6 batteries, no. 548079 4006 Magnifying glasses not included in scope of delivery

Designation	art.no.	€
Light unit for Fix and Vario-Focus stand magnifiers	560106 0006	40,50



5164

## SCHWEIZER Precision thread counter Tech-Line

- With aplanatic precision silicate lens
- Glass measurement scale: 10 mm, division 0.1 mm
- Brass frame, matt chrome-plated

Magnification	Lens Ø mm	art.no.	€
8x	16.3	<b>560123 0018</b>	<b>75,50</b>

5164



## SCHWEIZER Precision folding magnifier Tech-Line

- Innovative single-handed operation
- Aplanatic lens consisting of two plano-convex silicate lenses
- Black plastic frame
- Plastic casing with solvent-resistant painted finish

Magnification	Lens Ø mm	art.no.	€
6x	22.8	<b>560125 0006</b>	<b>24,80</b>
8x	22.8	560125 0008	28,-
10x	22.8	560125 0010	31,50
15x	22.8	560125 0015	33,60
20x	16.8	560125 0020	37,80

5164



560125 0010

## SCHWEIZER Bi-convex folding magnifier Tech-Line

- Bi-convex silicate lenses
- High-gloss polished stainless steel casing

Magnification	Lens Ø mm	art.no.	€
3x + 3x + 3x = 9x	30	<b>560128 0309</b>	<b>40,40</b>
3x + 5x = 8x	38	560128 0305	38,60

5164



560128 0309

560128 0305

## SCHWEIZER Watchmaker's loupes

### Standard version

- Lens ground from silicate glass
- Biconvex, 10x with plano-convex ancillary lens
- Shock-resistant plastic frame with air vent

### Version Tech-Line

- Aplanatic optics
- Plastic housing, with solvent-resistant painted finish

Magnification	Lens Ø mm	Design	art.no.	€
3x	25	Standard	<b>560115 0003</b>	<b>9,05</b>
5x	25	Standard	560115 0005	9,05
7x	25	Standard	560115 0007	10,80
10x	22.8	Tech-Line	560116 0010	15,75
15x	16.3	Tech-Line	560116 0015	19,85

5164



560116 0010

## SCHWEIZER LED hand-held illuminated magnifier Tech-Line CLASSIC

- Mobile hand-held illuminated magnifier with state-of-the-art light technology and ergonomic shape
- 2-level boost switch to optimise the lighting, with acoustic feedback and haptic guidance
- High-contrast and homogeneous light thanks to optimal adjustment and light intensity
- Light colour 4500K - neutral white
- Low energy consumption thanks to modern SMD LEDs
- Ergonomic design, non-slip soft-touch handle zone and pleasant haptics
- Supplied with 3x LR-3 battery

Magnification	Lens type	Lens Ø mm	art.no.	€
10x	Aplanatic	22.8	<b>560127 0010</b>	<b>69,20</b>
15x	Aplanatic	16.3	560127 0015	69,20
2x/4x	Bifocal/biconvex	70/20	560127 0002	73,80
4x	Aspherical	55	560127 0004	77,90
8x	Aplanatic	30	560127 0008	71,20

5164



560127 0010



## SCHWEIZER Headband magnifier Tech-Line BINO LED

- Very robust metal construction, painted in low-sheen black
- Swivel-mounted LED unit for adjusting the lighting
- Light colour 6000 K
- The headband magnifier can be worn under glasses

- Supplied without interchangeable lenses

Designation	art.no.	€
Headband magnifier with LED lighting	<b>560130 0001</b>	<b>84,-</b>

5164



### Interchangeable lenses

- Fold-up interchangeable lens case for various enlargements: 2x to 3.5x
- Interchangeable lenses are scratch-resistant and resistant to virtually all chemicals and solvents
- Metal-enclosed silicate glass interchangeable lenses
- Outstanding depth of field

Designation	art.no.	€
Interchangeable lens 2.5x	<b>560135 1025</b>	<b>21,30</b>
Interchangeable lens 2x	560135 1020	<b>20,90</b>
Interchangeable lens 3.5x	560135 1035	<b>26,80</b>
Interchangeable lens 3x	560135 1030	<b>23,-</b>

5164

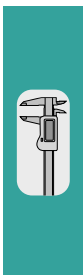


## ATORN® LED magnifier lamp

- Even, largely anti-glare lighting provided by 90 LEDs (colour temperature 6,500 K)
- Extremely long-life LEDs, no risk of breakage
- High-quality glass lenses with 1.75x or 2.25x magnification
- Metal arm with plastic covering, no risk of pinching
- Particularly slim magnifier casing with replaceable magnifier cover
- Extremely low power consumption (only around 9 W!)
- Table clamp

Magnification	Lens Ø mm	Projection mm	art.no.	€
1.75-times	125	1060	<b>560160 0175</b>	<b>198,50</b>
2.25-times	125	1060	560160 0225	<b>203,-</b>

5164



## SCHWEIZER Cleaning set

- High-end cleaning solution for all glass and plastic lenses and magnifiers
- Anti-static effect
- High-quality microfibre cleaning cloth included

Designation	art.no.	€
Cleaning set	<b>560131 0001</b>	<b>10,90</b>

5164



## Stereoscopic zoom microscope, trinocular

- Version with 3rd lens barrel to adapt e.g. a camera
- sturdy, robust microscope
- cordless battery-powered operation (optional)
- Magnification 7x to 45x
- Eyepiece pair 10x, with dioptic adjustment
- Working distance 100mm
- Integrated handle for easy transportation
- Equipped with long-life LED direct/backlight, colour temperature 6300 K
- Supplied with eyepiece pair 10x and power supply



Designation	art.no.	€
Stereo microscope	<b>561052 0001</b>	<b>509,-</b>
	5169	

## USB ocular camera for microscope

- Low-cost introduction to image/video transmission and visual measurement
- USB camera with EDGE technology for enhanced image reproduction
- Compatible with virtually all stereo and measuring microscopes using an adapter
- Adapter for Ø 23 mm, 30 mm/30.5 mm eyepieces and C-mount supplied
- USB 2.0 interface
- Images can be saved in all standard formats
- Optional reticle
- Simple measuring options for circles, angles, spacing
- Calibration function through supplied calibration standard
- Supplied with USB eyepiece camera with DinoCapture software and calibration standard



Designation	Resolution mm	art.no.	€
USB retrofit camera	1.3 MP	<b>561058 0005</b>	<b>399,-</b>
		5169	

## USB digital hand-held microscope

- For industrial inspection, quality control, assembly, repair, material defect analysis
- Low-cost introduction to image/video transmission and visual measurement
- CMOS Color Sensor
- Cameras available with EDGE technology for improved image reproduction
- Micro touch snapshot function for saving live images/videos directly
- Transfer of images to smartphone or tablet through optional WiFi adapter
- USB 2.0 interface
- Casing: Ø 32 x 105 mm
- DinoCapture software: 2D image measurement (lines, radius, diameter, circumference, polygon, angle) input of texts, output of measuring data in Excel at the click of a mouse
- Supplied with: USB hand microscope with USB cable L=1.8 m, DinoCapture software on CD

- 5610570.... Plastic casing, sensor resolution 1.3 MP, image resolution 1280x,1024 pixels
- 5610571.... Metal casing, sensor resolution 5 MP, image resolution 2592 x 1944 pixels

Model	Resolution mm	Magnification	Working distance mm	Design	art.no.	€
AM4113ZT	1.3 MP	10x-50x / 200x	0.5 - 60	-	<b>561057 0001</b>	<b>355,-</b>
AM4115ZT	1.3 MP	20x-200x	0.5 - 60	EDGE	561057 0004	<b>579,-</b>
AM7515MZT	5 MP	20x-200x	0.5 - 60	EDGE	561057 1002	<b>909,-</b>
					5169	



561057 0001

### Stands

- Column stands
- With focussing option

Height adjustable mm	Projection of lateral arm mm	art.no.	€
145	-	<b>561057 3005</b>	<b>52,40</b>
200	150	561057 3006	<b>213,-</b>
		5169	



561057 3005

561057 3006

**ATORN® Digital microscope Inspector**

- digital microscope system for visual inspection and for simple baseline measurements
- quick display of live image in full HD resolution (1080p)
- simple operation and control through integrated software
- outstanding representation of the workpiece thanks to image-enhancing functions
- no time-consuming recalibration for zoom alterations
- programmable buttons for quick and easy operation
- network-compatible for documenting and archiving images
- available with LED incident light or with LED direct/backlight
- 2.2x to 122x magnification, even with standard lenses
- Supplied with 5x lens, keypad, mouse, power supply, HDMI cable, Mini-USB cable, USB memory stick
- HD-Ready or FULL-HD monitor available as optional accessories



Description	art.no.	€
Digital microscope with LED reflected/transmitted light	<b>561070 0002</b>	<b>5.759,-</b>
Digital microscope with LED reflected light	561070 0001	5.419,-

5169

**Accessories**

Designation	Lens Ø mm	Magnification	art.no.	€
10x lens, planar	58	optical 122x / digital 266x	<b>561071 0004</b>	<b>629,-</b>
25x lens	58	optical 258x / digital 660x	561071 0002	1.029,-
360° gyration viewer	-	-	561071 0007	1.549,-
50x lens	58	optical 662x / digital 1324x	561071 0003	1.029,-
5x lens (standard accessory)	58	optical 66x / digital 122x	561071 0001	206,-
diffused LED dome light	-	-	561071 0006	1.029,-
Case for Inspector digital microscope	-	-	561071 0009	415,-
PC module for live image capture	-	-	561071 0008	519,-
polarised ring lamp with analyser	-	-	561071 0005	629,-

5169



561071 0004



561071 0005



561071 0009



561071 0006



## Mitutoyo Workshop measuring microscope

- Compact and robust base body made from special cast iron
- Coordinate measuring table
- Dovetail guide with rack and pinion drive for adjusting the microscope head to alter focus
- Standard magnification 30x (lens 2x, eyepiece 15x)
- Test item displayed without inversion
- Backlighting, incident lighting and ring lamp
- Replaceable crosshair graticule built into the eyepiece
- Additional graticules (e.g. for determining radii or for thread measurement) are available on request
- Angle measuring device, can be rotated through 360°, Vernier scale 6 minutes
- Supplied with 2x lens, 15x eyepiece, graticule with crosshair, measuring table **with digital built-in micrometer no. 505404 0001**, LED backlighting and LED incident lighting, LED ring lamp with holding fixture adapter, 2 spare bulbs (24 V), spare fuse (0.5 A), covering hood, power supply for connection to 230 V / 50 Hz, Operating manual, shipped in disposable packaging



QM-DATA can be connected

### Set

- Contains 7 pcs.: TM 505/510 microscope, lens with 2x magnification, eyepiece with 15x magnification, crosshair graticule, 2 digital built-in micrometers, ring lamp with holding fixture adapter

Model	Travel mm	art.no.	€
TM 505B	50 x 50	561501 1012	6.459,-
TM 1005B	100 x 50	561501 1013	7.839,-

5105



Supplied with ring light

### Eyepieces and lenses

- Sizes 0115 and 0202 are already included in the all-in-one device

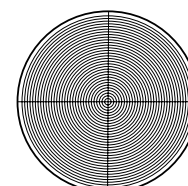
Designation	art.no.	€
10x eyepiece	561510 0110	197,-
15x eyepiece	561510 0115	197,-
20x eyepiece	561510 0120	217,-
2x lens	561510 0202	236,-
5x lens	561510 0205	313,-
10x lens	561510 0210	313,-

5105

### Total enlargements with ocular lens combinations:

Lens	Ocular 10x	15x	20x
2x	<b>20x</b> (6.5 mm)	<b>30x</b> (6.5 mm)	<b>40x</b> (5 mm)
5x	<b>50x</b> (2.6 mm)	<b>75x</b> (2.6 mm)	<b>100x</b> (2 mm)
10x	<b>100x</b> (1.3 mm)	<b>150x</b> (1.3 mm)	<b>200x</b> (1 mm)

The data provided in brackets specifies the image diameter.



561510 0042

### Replaceable eyepiece graticules

Designation	art.no.	€
Graticule, circle, Ø 0.05-4.0 mm	561510 0042	106,-

5105

### Holding fixture for test items

Designation	art.no.	€
Rotatable table for No. 5615010001	562501 0003	796,-
Rotatable table for No. 5615010002	562501 0004	976,-

5105



562501 0004

## Mitutoyo Measuring projector PJ-PLUS

NEW

- Profile projector for accurate transmitted and incident light testing of small to medium-sized workpieces
- Clear image across the entire screen  $\varnothing$  of 315 mm
- Screen can be rotated 360° with cross hairs
- 10x lens with separate semi-opaque incident mirror included
- LED transmitted and incident lighting with infinitely variable luminous intensity control for long service life at low power consumption
- Telecentric lighting system for uniform lighting
- Fanless design prevents contaminants from entering the unit
- Built-in digital displays for reading the angle of the rotatable screen  
Switch between 1 arc minute or 0.01 degree, with 0.001 mm resolution for the X and Y axis
- RS-232C interface for X and Y axis
- **562001 1010** with 100 x 100 mm coordinate measuring table, fine and quick adjustment across the entire movement range, integrated glass scales, max. workpiece weight: 10 kg
- **562001 2010** with 200 x 100 mm coordinate measuring table, fine and quick adjustment across the entire movement range, integrated glass scales, max. workpiece weight: 8 kg
- Supplied with power cable for 230 V / 50 Hz, covering hood, 10x lens, anti-glare protection, operating manual in disposable shipping packaging
- **Calibration on request**



5107

Model	Travel mm	art.no.	€
PJ-PLUS P1010A	100x100	<b>562001 1010</b>	<b>10.100,-</b>
PJ-PLUS P2010A	200x100	562001 2010	12.500,-

	PJ-A3005F-150				PJ-A3010F-200			
	10x	20x	50x	100x	10x	20x	50x	100x
<b>Field of view <math>\varnothing</math> mm</b>	31,5	15,7	6,3	3,1	31,5	15,7	6,3	3,1
<b>W mm</b>	66 (20)	32,5 (2)	12,6 (12,6)	5 (5)	66 (20)	32,5 (2)	12,6 (12,6)	5 (5)
<b>H mm</b>	103,5	103,5	103,5	103,5	92,5	92,5	92,5	92,5
<b>D mm</b>	207	87	27	10	185	87	27	10

()= with incident lighting

### Accessories

Designation	art.no.	€
10x lens with semi-opaque incident mirror (standard accessory)	<b>562030 0001</b>	<b>775,-</b>
20x lens with semi-opaque incident mirror	562030 0002	775,-
50x lens with integrated incident mirror	562030 0003	1.014,-
100x lens with integrated incident mirror	562030 0004	1.014,-
Semi-opaque incident mirror (standard with lens)	562030 0008	79,-
Special incident mirror with 10x lens	562030 0010	101,-
Special incident mirror with 20x lens	562030 0011	80,-

5105

THE **BENCHMARK**  
STANDARD

Mitutoyo



MITUTOYO  
Measuring equipment  
catalogue  
approx. 620 pages  
Art.no. 019900 0069

Overview of all free manufacturers' catalogues  
on page 16/17

## Mitutoyo Measuring projector PV-5110

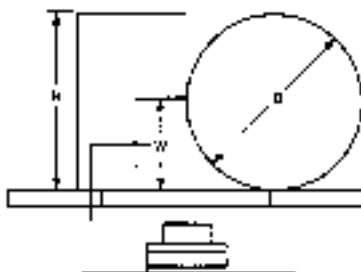
- Robust, easy-to-operate stand projector
- Clear image across the entire screen area, Ø 508 mm
- 360° rotatable screen, with crosshairs, locking, fine adjustment
- Built-in digital angle reading, can be switched from 1 arc minute to 0.01 degree
- Halogen backlighting and incident lighting
- 10x lens included
- 200 x 100 mm coordinate measuring table, fine adjustment across the entire movement range and quick adjustment along both axes, built-in glass scales, supporting surface of the table can be swivelled  $\pm 5^\circ$  for better workpiece alignment, max. workpiece weight: 5 kg
- Magnification uncertainty: 0.1 % backlighting, 0.15 % incident light
- Hand wheel on the side of the casing for adjusting the measuring table height to alter focus
- Supplied complete with two individually adjustable halogen incident lights; holding fixture for optional digital display unit; 230 V / 50 Hz power cable; 10x lens set; operating manual; shipped in disposable packaging
- **Calibration on request**

Designation	art.no.	€
Model PV-5110 without display	<b>562050 0005</b>	<b>15.450,-</b>

5107

	PV-5110				
	5x	10x	20x	50x	100x
<b>Field of view Ø mm</b>	100	50	25	10	5
<b>W mm</b>	60 (27)	60 (60)	60 (60)	32,4	22,5
<b>H mm</b>	125	181	206	87	87
<b>D mm</b>	120	120	120	64,8	45

( )= with incident lighting



PV-5110 with optional M2 data processing system

### Accessories

Designation	art.no.	€
Lens attachment 5x	<b>562070 0001</b>	<b>6.589,-</b>
Lens attachment 10x (standard accessory)	562070 0002	2.153,-
Lens attachment 20x lens	562070 0003	1.730,-
Lens attachment 50x	562070 0004	1.780,-
Lens attachment 100x	562070 0005	1.982,-
Tiltable centring support	562501 0002	824,-
Tool holder	562501 0005	266,-
V-block with clamp for Ø 5-25 mm	562501 0006	313,-
Colour filter, green	562501 0020	85,-
Halogen bulb, 24 V/150 W	562501 0021	13,-

5103



562501 0006



562501 0002



## Mitutoyo M2 data processing system

NEW

- Intuitive 2D data processing system
- Measurement points recorded by way of crosshairs (562705 0001) or optical edge sensor (562705 0002)
- Easy to measure points, degrees, circles, angles, etc.
- Constructs measurement points and links various elements
- Parts program development in Teach-in process
- Tolerance inspection in accordance with DIN/ISO
- Comprehensive measurement reports
- A Windows 10-compatible PC is required to use the software.
- M2 measurement software supplied with interface box, connection cable, device holder for optional tablet PC on the projector housing, power supply and USB cable



Tablet PC not included in scope of delivery

Designation	art.no.	€
M2 data processing system without edge detection	562705 0001	1.750,-
M2 data processing system with edge detection for PJ and PH projectors	562705 0002	3.000,-
M2 data processing system with edge detection for PV projectors	562705 0003	3.000,-

5104

## Mitutoyo Digital display unit LINEAR SCALE model KA200

- Compact design
- Easily readable 15 mm high LED digits
- For connecting model AT 103, AT 116, AT 112F and AT 715 scales on two or three axes  
For connection to turning and milling machines (adjustable mode)
- Adjustable resolution: 0.001 mm and 0.005 mm resolution (for AT 1xx scales)
- Display: 8 digits, (-) sign, zero point
- Connection: 230 V / 50 Hz
- Power consumption: 30 VA
- Supplied with mains power cable and operating manual, shipped in disposable packaging

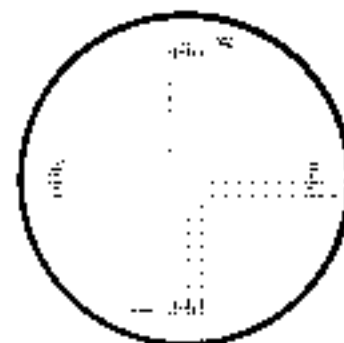


Connectable axes	Dimensions L x W x H mm	Weight kg	art.no.	€
2	300 x 70 x 167	1.25	574021 2004	586,-

5105

## Mitutoyo Standard target

- For comparing screen displays on measuring projectors
- Standard targets are reference drawings on which specific geometric shapes, e.g. circles, are drawn as fixed dimensions for the different magnifications.
- **With radii**
- Made from low-warp, transparent plastic, coated with a protective layer
- Geometric shapes printed on the underside
- Line widths: 0.05, 0.08, 0.10 and 0.12 mm, different for even millimetre and intermediate dimensions.  
Linear division line accuracy: 0.05 mm over 300 mm. Thermal expansion: 0.08 mm per 10° C
- Standard targets in other versions (e.g. for threads) available on request



Designation	Measuring plate Ø mm	art.no.	€
Standard target, type RA (radii)	300	562520 3003	549,-
Standard target, type RA (radii)	500	562520 5003	1.129,-

5105

## Mitutoyo SurfTest SJ-210 surface roughness tester

Digi-  
matic

USB

- Handy mobile test device, designed for use in production environments
- Compact design
- Easy to handle
- Suitable for measuring surface roughness directly on the clamped workpiece during production or stationary inspections
- Large, easy-to-read 6 cm (2.4") colour LCD display, can be rotated electronically
- Profiles displayed in real time
- Integrated memory for 10 measurement conditions
- Memory can be expanded with a micro SD card up to max. 2 GB: e.g. 500 measurement conditions + 10,000 measurement values or 500 measurement conditions + 500 profiles, analysis software on request
- With RS232C, Digimatic and USB interfaces
- Foot switch connector
- Colour-based tolerance evaluation
- Allocation of access rights
- Choice of 16 languages
- Switchable mains or battery operation
- Feed unit can either be integrated in the device or used separately with a connection cable
- Motorised feed with up to 3 user-selectable measuring speeds
- Probe system skid radius 40 mm, skid pressure force < 400 mN
- Probe tip geometry in accordance with DIN EN ISO 3274, radius 2 µm, point angle 60°
- Double skid system for measuring sheet metal in accordance with DIN EN ISO 10049 available on request, comprehensive optional accessories on the following pages
- **Technical data**
- **Profiles:** Roughness profile (R), DF profile, R motif
- **Standards:** DIN EN ISO, VDA, ANSI, JIS, user-defined conditions
- **Measurement range:** 360 µm
- **Evaluation parameters:** Ra, Rq, Rz, Ry, Rp, Rv, Rt, R3z, Rsk, Rku, Rc, Rpc, RSm, Rmax, Rz1max, S, HSC, Rz1S, Rppi, RΔa, RΔq, Rlr, Rmr, Rmr(c), Rδc, Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Vo, Rpm, tp, Htp, R, Rx, AR
- **Cut-off lengths:** λc: 0.08, 0.25, 0.8 and 2.5 mm
- **Digital filters:** Gaussian, 2CR75, PC75
- **Number of individual measurement sections:** 1 to 10
- **Limit wavelength λs:** Set to specification
- **Measuring force:** 0.75 mN
- **Power supply:** Mains adapter 230 V, 50 Hz and fitted battery
- Supplied with roughness standard, mains adapter, protective film for the display, carry bag and operating manual



Use with height meter 5305020300 via adapter 5705310016



Transverse measurement, S version

Designation	art.no.	€	Factory calibration device		Factory calibration standard roughness	
			art.no.	€	art.no.	€
SURFTEST SJ-210 surface roughness tester	570521 0210	2.215,-	079942 W901	115,-	073103 W158	140,-
SURFTEST SJ-210 R surface roughness tester with automatic probe head lifting and lowering	570521 0230	2.575,-	079942 W901	115,-	073103 W158	140,-
SURFTEST SJ-210 S surface roughness tester with transverse measurement feed	570521 0031	4.100,-	079942 W901	115,-	073103 W158	140,-

5105

## Mitutoyo Roughness standard

- For adjusting surface roughness meters (standard accessory with SJ-210 / SJ-310 / SJ-410)
- Approx. Ra 3.0 µm / Rmax (Ry) 9.4 µm
- Standard size 32 x 22 mm
- In shock-proof, anti-slip plastic casing, approx. 55 x 46 mm



Description	art.no.	€	Factory calibration standard roughness	
			art.no.	€
Roughness standard Ra approx. 3.0 µm / Rmax (Ry) 9.4 µm	570530 0101	303,-	073103 W158	140,-

5105

## Mitutoyo Surftest SJ-210 surface roughness tester

NEW

Digi-  
matic

USB

- Portable mains-independent skid system for determining surface roughness
- Separate feed allows measurements in hard-to-reach places, as well as overhead measurements
- Dust-protected, touch-sensitive control panel and integrated printer
- Extremely easy-to-use and intuitive menu navigation
- Measurement results / profiles shown clearly on a 14.5 cm (5.7") colour display
- 16 languages
- Storage of up to 10 measurement conditions
- Statistics function and colour-coded tolerance analysis
- Customisable password protection
- Storage of measurement data on an optional SD card
- Automated calibration function / can be calibrated based on the average of up to 12 measurements
- Choice of mains or battery operation
- Profile method with single skid system
- Measurement range: X-axis feed = 16 mm, S feed = 5.6 mm
- 60° contact point with 2 µm radius / measuring force 0.75 mN
- Measuring speed: 0.25 mm/s, 0.5 mm/s, 0.75 mm/s
- Analysis parameters: Ra, Rq, Rz, Ry, Rp, Rv, Rt, R3z, Rsk, Rku, Rc, R<sub>Pc</sub>, R<sub>Sm</sub>, R<sub>max</sub>, Rz1<sub>max</sub>, S, HSC, RzJIS, R<sub>ppi</sub>, RΔa, RΔq, R<sub>lr</sub>, R<sub>mr</sub>, R<sub>mr</sub>(c), R<sub>dc</sub>, Rk, R<sub>pk</sub>, R<sub>vk</sub>, Mr1, Mr2, A1, A2, Vo, λa, λq, Lo, R<sub>pm</sub>, t<sub>p</sub>, H<sub>tp</sub>, R, RX, AR, W, AW, Wx, Wte
- Cut-off length: 0.08 mm / 0.25 mm / 0.8 mm / 2.5 mm / 8 mm
- Number of individual measurement sections: 1x, 2x, 3x, 4x, 5x, 6x, 7x, 8x, 9x, 10x, unset length
- Digital filter: 2CR75 / PC75 / Gaussian
- Parameters in accordance with DIN EN ISO, VDA, JIS, ANSI and MOTIF
- Data communication: Digimatic, RS-232, SD memory card
- Supplied with roughness standard, mains adapter and 5 rolls of spare paper



Use with height meter 5305020300  
via adapter 5705310016



Transverse measurement,  
S version

Designation	art.no.	€	Factory calibration standard roughness		Factory calibration device	
			art.no.	€	art.no.	€
SURFTEST SJ-310 surface roughness meter	570526 0310	4.450,-	073103 W158	140,-	079942 W901	115,-
Surface roughness meter SURFTEST SJ-310 R with automatic probe head lifting and lowering	570526 0330	4.800,-	073103 W158	140,-	079942 W901	115,-
SURFTEST SJ-310 S surface roughness meter with transverse measurement feed	570526 0350	6.300,-	073103 W158	140,-	079942 W901	115,-

5105

## Mitutoyo Measuring stand

- For surface roughness testers SJ-210, SJ-310, SJ-411 and SJ-412
- Granite measuring table, 400 x 250 mm, with a clamping T-slot
- Total height: approx. 555 mm  
Height adjustment: 250 mm
- 570531 0116 requires adapter no. 570531 0017 for holding roughness meters



SURFTEST SJ-210 not included

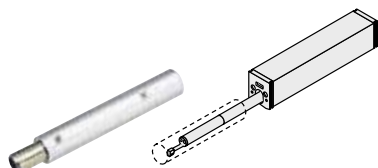
Surface roughness testing equipment  
not included in scope of delivery

Designation	art.no.	€
Measuring stand for surface roughness testers SJ-411 and SJ-412	570531 0107	732,-
Measuring stand for surface roughness testers SJ-210 and SJ-310	570531 0116	738,-

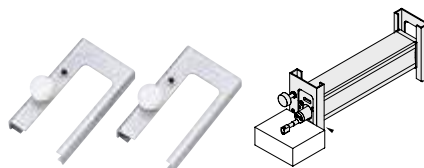
5103

## Mitutoyo Accessories

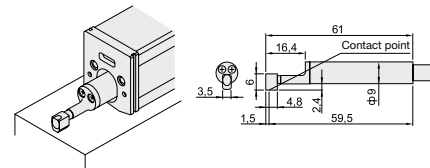
- For Surfrest SJ-210 / SJ-310 surface roughness testers



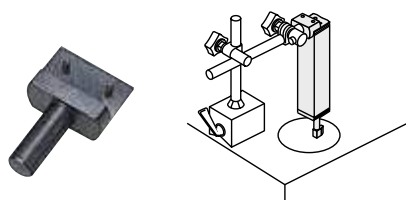
Extension 570531 0010



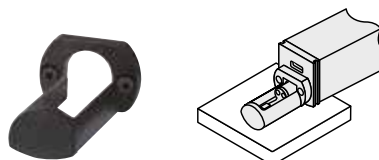
Supporting feet 570531 0015



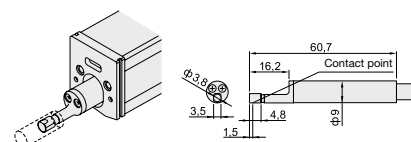
Standard probe head 570531 0050



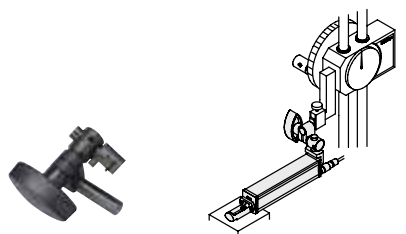
Adapter for magnetic stands 570531 0017



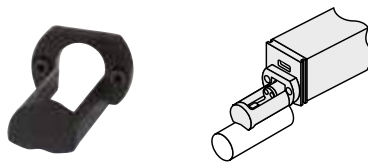
Skid for flat parts 570531 0020



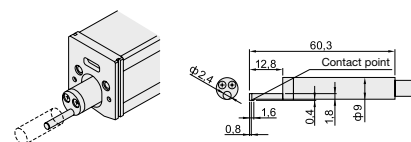
Probe head for bores from Ø 4 mm 570531 0051



Adapter for height meters and marking-out instruments 570531 0016



Skid for straight parts 570531 0021



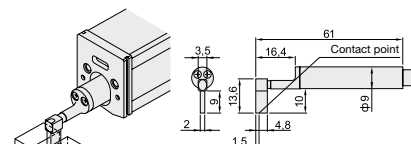
Probe head for bores from Ø 2.8 mm 570531 0052

### Probe heads, adapters, skids

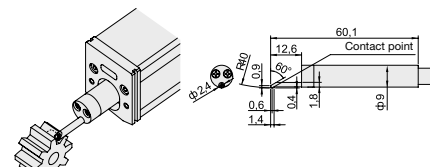
- Probe heads with 2 µm tip radius, 60° point angle and 0.75 mN measuring force
- Size 0001 with 5 µm tip radius, 90° point angle and 4 mN measuring force
- Size 0050 comes as standard with SJ-210 / SJ-310
- Sizes 0015 / 0020 / 0021 come as standard with SJ-310

Designation	art.no.	€
Standard probe head, bores from Ø 7 mm	570531 0050	594,-
Probe head, bores from Ø 4 mm	570531 0051	721,-
Probe head, bores from Ø 2.8 mm	570531 0052	721,-
Probe head for narrow grooves	570531 0053	721,-
Probe head for tooth flank measurements	570531 0054	1.230,-
Probe head for transverse feed (standard with S-version)	570531 0055	637,-
Probe head for bores from Ø 7 mm (5 µm 90° / 4 mN)	570531 0001	478,-
Probe head extension, 50 mm	570531 0010	220,-
1 pair of feet to adjust the height of the feed unit (standard accessory SJ-310)	570531 0015	133,-
Adapter for height meters and marking-out instruments	570531 0016	90,-
Adapter for surface roughness testers SJ-210 / SJ-310	570531 0017	45,-
Skid for flat workpieces (standard accessory SJ-310)	570531 0020	90,-
Skid for straight workpieces, 160° V-block (standard accessory SJ-310)	570531 0021	90,-
Spare connection cable, display feed unit SJ-210	570531 0022	75,-
Battery pack for Surfrest SJ-301	570531 0700	130,-

5105



Probe head for narrow grooves 570531 0053



Probe head for tooth flank measurement 570531 0054

### Consumables for Surfrest SJ-310 and SJ-410

Designation	art.no.	€
Packet with 5 rolls of graph paper	563030 0101	29,-

5103





## ATORN® Surface roughness tester easyRoughness



- Highly accurate roughness meter for workshop and laboratory use
- Compatible with skids and free probes
- Wide range of special measuring probes
- Measuring probes can be extended up to 500 mm
- Automatic calibration
- Measurement lengths configurable from 0.5 to 1.5 mm
- Configurable measuring speeds
- Calibration of up to 8 measuring probes
- Storage of measurement conditions with images
- Configurable languages: German, English, French, Italian, Spanish, Polish, Chinese

### • Technical data

Measured values:

DIN/ISO: Ra, Rz (DIN), Rmax, R3z, Rt, Rq (RMS), Rk, Rq, Rv, Rpk, Rvk, MR1, MR2, Rpc, C1, C2, contact ratio Rmr, CO, Cz, VO Rdg, RLO

JIS: Ra (Jis), Rz (JIS)

ISO 12085: R, AR, Rx

Measurement ranges: Ra, Rq 0 - 20.00 µm Rest 0 - 350 µm

Measurement range in Z: approx. 450 µm

Contact point: Diamond tip 5 µm 90° (standard) or 2 µm 60° (optional)

Measuring force diamond: < 0.5 mN

Probe system: analogue hall effect technology with high-linear output

- Supplied with standard probe SKT/5, standard roughness 3.0 µm, boxed



Designation	art.no.	€	Factory calibration standard roughness		Factory calibration device	
			art.no.	€	art.no.	€
Surface roughness tester easyRoughness	570532 0001	7.119,-	073103 W158	140,-	079942 W901	115,-
5169						

### Measuring probe

- Other versions available on request

Designation	art.no.	€
Standard probe SKT/5 (standard probe)	570533 0001	949,-
Standard probe SKT/2	570533 0002	1.149,-
Non-grooved probe NFH-15/5	570533 0033	1.429,-
5169		



### Standard roughness

- Other roughness standards available on request

Designation	art.no.	€	Factory calibration standard roughness	
			art.no.	€
Standard roughness, metal Ra 1.0 µm	570533 0201	321,-	073103 W158	140,-
Standard roughness, metal Ra 3.0 µm	570533 0202	321,-	073103 W158	140,-
5169				



### Measuring stand

- Column height 500 mm

Designation	art.no.	€
Granite measuring table 400x250x50 mm	570533 0102	1.179,-
5169		





## Mitutoyo Linear scales

INFO

### Digital length measurement system

The DRO system (**D**igital **R**ead **O**ut) newly developed by Mitutoyo includes the linear scales of the AT 100 series and the display units (counters) of the K series. Linear scales and counters offer maximum precision in reading axial adjustments of machine tools and measuring instruments.

The DRO system can be assembled to optimally fulfil specific tasks such as use on turning, milling or grinding machines.

The linear scales are supplied in an attachable state and are easy to install. The performance of machines and facilities is increased, read errors are eliminated. Backlash in guides or adjustment backlash is apparent because the dimension of every movement of the slide or a guide piece is read. Linear errors in an axis of travel can be compensated for on the display unit. Fitting must take place parallel to the axis (within 0.2 mm on scale length), or else deviations may arise.

The linear scale systems are offered with three cross sections:

**AT 116** Standard profile (cross section 22 x 35 mm) up to 1500 mm with permanently attached connection cable

**AT 715** Standard profile with ABSOLUTE scale (cross-section 22 x 36.5 mm) up to 1800 mm with permanently attached connection cable



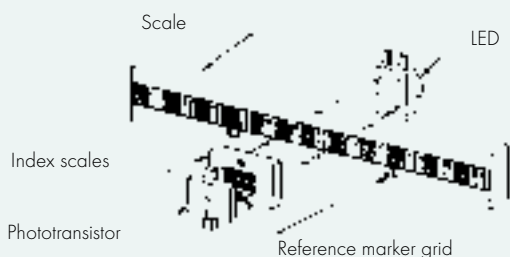
AT 116



AT 715

The aluminium housing of the linear scale is fitted with an oil-resistant plastic lip on the encoder side. The connection cable is housed in steel and shielded. If the standard length of the connection cable is not sufficient, extension cables (special accessories) are available.

The easy-to-use display units of the K series are available in different models for a wide variety of tasks.



Functional principle AT 112F / AT 116

### Caution!

When selecting suitable scales, please always take into account the effective travel of your machine that can be adjusted by hand. Please also bear in mind that a mini-profile AT 112F is available for use in confined installation surroundings.

	KA counter
Zero position	•
ABS origin only AT 715	•
Adjustment of resolution	•
Switchable counting direction	•
mm/inch switching	•
Preselection/zero position	•
Halving of displayed value	•
ABS/INC coordinate switching	•
Zero approximation (INC coordinate)	•
Signal sensor	optional
Hole circle machining	•
Hole row machining	•
Scale reference points* only AT 112 / 115	•
Tool specifications	10
Addition of the values of two axes*	•
RS-232C output	optional
Linear error compensation	•
Stabilisation of last position on display	•
• = Standard accessories	
* = This function is not available in the two-axes version	

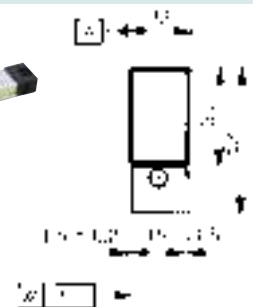


## Mitutoyo LINEAR SCALE AT 116 digital length measurement system



- **Standard profile**
- Installation-ready glass scale with aluminium profile casing
- Fasteners included
- Profile cross-section 22 x 35 mm (without encoder unit)
- **Accuracy:** (5 + 5L/1000) µm at 20 °C
- Supplied with operating manual and factory certificate, shipped in disposable packaging
- **Caution:** When selecting suitable scales, please always take into account the effective manually adjusted travel for your machine. Please also bear in mind that a mini profile AT 112F is available for use in tight installation spaces.

**With factory certificate!**



Cross section dimensions

Measurement range mm	max. encoder route mm	Total length mm	Cable length m	art.no.	€
100	120	276	3.5	573012 0100	457,-
150	170	326	3.5	573012 0150	464,-
200	220	376	3.5	573012 0200	469,-
250	270	426	3.5	573012 0250	477,-
300	330	486	3.5	573012 0300	482,-
350	380	536	3.5	573012 0350	487,-
400	430	586	3.5	573012 0400	530,-
450	480	636	3.5	573012 0450	540,-
500	540	696	3.5	573012 0500	552,-
600	640	796	3.5	573012 0600	563,-

5105

Measurement range mm	max. encoder route mm	Total length mm	Cable length m	art.no.	€
700	740	896	3.5	573012 0700	575,-
750	780	936	3.5	573012 0750	587,-
800	840	996	3.5	573012 0800	599,-
900	940	1096	3.5	573012 0900	611,-
1000	1040	1196	5.0	573012 1000	640,-
1100	1140	1296	5.0	573012 1100	669,-
1200	1240	1396	5.0	573012 1200	705,-
1300	1340	1496	5.0	573012 1300	752,-
1400	1440	1596	5.0	573012 1400	797,-
1500	1540	1696	5.0	573012 1500	845,-

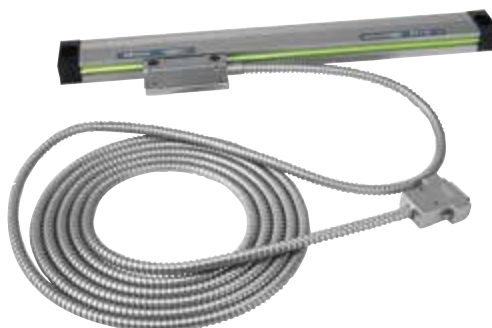
5105

## Mitutoyo Digital length measurement system LINEAR SCALE AT 715



- **ABSOLUTE scale**
- Linear scale ready for direct mounting with aluminium profile casing
- Includes fasteners
- Profile cross-section 22 x 35 mm (without encoder unit)
- **Connection only to KA-COUNTER (574021...)**
- Error margin:
  - 100-500 mm = 5 µm
  - 600-1800 mm = 7 µm
  - 2000-3000 mm = 10 µm
- Supplied with operating manual, shipped in disposable packaging
- **Attention:** When selecting suitable scales, please always take into account the effective manually adjusted travel for your machine. Please also bear in mind that a mini-profile AT 112F is available for use in confined installation surroundings.

**With factory certificate!**



**ABSOLUTE**



Sicherheit Staub- und wassergeschützt

www.tuv.com ID 0000007295



Measurement range mm	max. encoder route mm	Total length mm	Cable length m	art.no.	€
100	120	278	3.5	573030 0100	327,-
150	170	328	3.5	573030 0150	327,-
200	220	378	3.5	573030 0200	327,-
250	270	428	3.5	573030 0250	327,-
300	330	488	3.5	573030 0300	330,-
350	380	538	3.5	573030 0350	333,-
400	430	588	3.5	573030 0400	336,-
450	480	638	3.5	573030 0450	339,-
500	540	698	3.5	573030 0500	348,-
600	640	798	3.5	573030 0600	351,-
700	740	898	3.5	573030 0700	357,-
750	780	938	3.5	573030 0750	360,-
800	840	998	3.5	573030 0800	369,-
900	940	1098	3.5	573030 0900	393,-
1000	1040	1198	5.0	573030 1000	414,-

5105

Measurement range mm	max. encoder route mm	Total length mm	Cable length m	art.no.	€
1100	1140	1298	5.0	573030 1100	429,-
1200	1240	1398	5.0	573030 1200	444,-
1300	1340	1498	5.0	573030 1300	474,-
1400	1440	1598	5.0	573030 1400	495,-
1500	1540	1698	5.0	573030 1500	528,-
1600	1640	1798	5.0	573030 1600	564,-
1700	1740	1898	5.0	573030 1700	591,-
1800	1840	1998	5.0	573030 1800	624,-
2000	2040	2198	5.0	573030 2000	942,-
2200	2240	2398	5.0	573030 2200	1.014,-
2400	2440	2598	7.0	573030 2400	1.203,-
2500	2540	2698	7.0	573030 2500	1.239,-
2600	2640	2798	7.0	573030 2600	1.278,-
2800	2840	2998	7.0	573030 2800	1.362,-
3000	3040	3198	7.0	573030 3000	1.512,-

5105

## Mitutoyo Digital display unit LINEAR SCALE model KA200

- Compact design
- Easily readable 15 mm high LED digits
- For connecting model AT 103, AT 116, AT 112F and AT 715 scales on two or three axes  
For connection to turning and milling machines (adjustable mode)
- Adjustable resolution: 0.001 mm and 0.005 mm resolution (for AT1xx scales)
- Display: 8 digits, (-) sign, zero point  
Connection: 230 V / 50 Hz  
Power consumption: 30 VA
- Supplied with mains power cable and operating manual, shipped in disposable packaging



Connectable axes	Dimensions L x W x H mm	Weight kg	art.no.	€
2	300 x 70 x 167	1.25	574021 2004	586,-
3	300 x 70 x 167	1.30	574021 2005	705,-
				5105

### Accessories

- Interface plug-in card with a variety of possible uses
- Page 1 with RS-232C interface
- Page 2 with USB output, DIGIMATIC input and foot switch connection socket

Designation	art.no.	€
Interface plug-in card	574021 1200	240,-
		5105

## Mitutoyo Extension cable

- For **LINEAR SCALE** Length measurement systems
- Ready-made, steel-covered and shielded extension cable including connector
- **Caution:** Only one extension cable may be connected at any time, otherwise electronic data transfer may be impaired.  
If you require longer cables, please contact us.



suitable for AT 116



suitable for AT 715

Cable length m	AT 116		AT 715	
	art.no.	€	art.no.	€
2	573045 0002	177,-	573046 0002	189,-
5	573045 0005	257,-	573046 0005	267,-
7	573045 0007	307,-	573046 0007	324,-
		5105	5105	

**THE BENCHMARK STANDARD**

Mitutoyo



MITUTOYO  
Measuring equipment  
catalogue  
approx. 620 pages  
Art.no. 019900 0069

Overview of all free manufacturers' catalogues  
on page 16/17



## TC layer thickness measuring instrument

- For quick and non-destructive layer thickness measurement of coatings on ferro-magnetic base materials and non-ferrous metals
- With external (TE) probe
- Small, handy device
- Easily readable LCD display
- RS 232 C interface
- Measurement principle
  - Model TE-F** for measuring non-magnetic layers on a ferro-magnetic base material (steel/iron)
  - Model TE-N** for measuring non-conductive layers (anodic oxide layer, painted surface protection etc.) on non-ferrous metals
  - Model TE-FN** combination of both aforementioned measurement principles
- Measurement range 0 to 1250  $\mu\text{m}$   
Resolution < 100  $\mu\text{m}$  = 0.1  $\mu\text{m}$  / > 100  $\mu\text{m}$  = 1  $\mu\text{m}$   
Minimum strength of base material 0.3 mm  
Smallest measuring area  $\varnothing$  6 mm  
Smallest curve radius: F = 1.5 mm convex, F = 25 mm concave, N = 3 mm convex, N = 50 mm concave  
Accuracy  $\pm$  4% of measured value (standard)  
 $\pm$  1% of measured value (two-point calibr.)  
Power supply 4 x LR3 Micro, AAA  
Weight 81 g  
Dimensions L x W x H, 131 x 65 x 28 mm
- Supplied in transport box with zero point plate, spacer foils, 4 batteries LR3 No. 5480794003 and operating manual



### With external probe

Designation	ferromagnetic base material	Non-ferrous metal	art.no.		Factory calibration	
			art.no.	€	art.no.	€
TE-F	Yes	No	577004 0001	370,-	073103 W159	115,-
TE-N	No	Yes	577004 0002	410,-	073103 W159	115,-
TE-FN	Yes	Yes	577004 0003	470,-	073103 W159	115,-

5171



## Ultrasound wall thickness measuring instrument

- Non-destructive material thickness measurements (e.g. wall thickness) on homogeneous, sound-conducting materials, e.g. metals, ceramics, plastics, glass
- Large, easily readable display
- Test head  $\varnothing$  10 mm, test frequency 5 MHz, sonic speed 1,000 - 9,999 m/s
- 1.2 - 230 mm measurement range, 0.1 mm increments
- Individual measurements or scan mode (10 measurements per second)
- Memory for 20 files (100 measurements per file)
- Battery life approx. 150 hours
- Weight 245 g
- Supplied in a plastic case with a 5 MHz test head, 2x LR6 batteries (no. 5480794006), connection agent (70 ml), operating manual



Designation	Measurement range mm	art.no.	€
TN 230-0,1 US	1.2 - 230	577005 0001	569,-

5171

### Accessories

Designation	Measurement range mm	art.no.	€
Small measuring head, $\varnothing$ 6 mm, 7 MHz, height 25 mm	0.75 - 80	577005 1000	112,-

5171





## HMM rebound hardness tester

- For testing the hardness of large, solid workpieces
- Minimum wall thickness 8 mm, minimum workpiece weight 3 kg
- Workpiece surface Ra < 10 µm
- Integrated data storage for up to 9 measurement groups
- Basis of LEEB hardness test and calculation
- Switchable backlighting, battery operation
- Dimensions L x W x H: 150 x 80 x 30 mm
- Direct display of HRC, HRB, HV, HB, HS, HL and tensile strength parameters

### Technical data:

#### Hardness scale ranges

HRC 19.8 - 68.5  
 HRB 13.5 - 101.7  
 HV 80 - 976  
 HB 30 - 655



Wireless infra-red printer included



Designation	Measurement range HL	Error limit %	Factory calibration	
			art.no.	€
HMM	170 - 960	1.5	576103 0001	1.099,-
HMM without printer	170-960	1.5	576103 0010	889,-

5171

## Surface comparison standard

### • For visual and tactile comparison

- Wear-resistant and stainless
  - Cannot be calibrated
  - Supplied in a synthetic leather case
- 30 reference samples for the entire spectrum of machining processes, approx. 120 x 90 mm: Horizontal milling, reaming, face milling, lapping, longitudinal turning, flat grinding

Comparison range Ra µm	ISO roughness classes	art.no.	€
0.05 - 12.5	N2 - N10	570601 0010	315,-

5169

- Separate plate for every machining process
- Enclosed table with Rp, Rt and Rz values

Processing method	Number of samples	Comparison range Ra µm	ISO roughness classes	art.no.	€
Metal blasting	8	3.2 - 25	-	570602 0002	305,-
Hand polishing	5	0.0125 - 0.2	N0 - N4	570602 0004	395,-
Turning	8	0.4 - 50	N5 - N12	570602 0006	183,50
Face milling	8	0.4 - 50	N5 - N12	570602 0007	183,50
Surface grinding	8	0.025 - 3.2	N1 - N8	570602 0008	183,50
Cylindrical grinding	8	0.025 - 3.2	N1 - N8	570602 0009	183,50
Electrical discharge machining	8	0.4 - 50	N5 - N12	570602 0010	183,50

5169



## ATORN® Laser distance measuring instrument

NEW



- Easy-to-use, handy laser distance measuring instrument for measurements in single or continuous measurement mode
- Measurement range 0.05 to 30 m
- Backlit display
- Automatic switch-off
- Laser class 2
- Dimensions 80 x 30 x 22 mm
- Supplied with pouch and 2x LR3 batteries no. 548079 4003

Measurement range mm	Error limit mm	Weight kg	art.no.	€
0.05 bis 30	2	0.1	557530 1000	80,40

5179



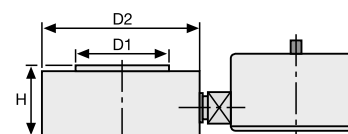


## Load cell

- For measuring pressure forces; low height and versatile; for occasional inspection measurements e.g. during adjustment and service work,
- **Hydraulic design**
- Drag indicator
- Supplied in a carry case with calibration certificate

Measurement range	Reading	Load cell Ø D2 mm	Measuring area Ø D1 mm	Pressure gauge Ø mm	H mm	art.no.	€
0-250 N	5 N	75	34	63	30	<b>576610 0001</b>	509,-
0-400 N	10 N	75	34	63	30	576610 0002	509,-
0-630 N	10 N	75	34	63	30	576610 0003	509,-
0-1 kN	10 N	75	34	63	30	576610 0004	509,-
0-1.6 kN	50 N	75	34	63	30	576610 0005	509,-
0-2.5 kN	50 N	75	34	63	30	576610 0006	509,-
0-4 kN	100 N	75	34	63	30	576610 0007	509,-
0-6.3 kN	100 N	75	34	63	30	576610 0008	509,-
0-10 kN	200 N	75	34	63	30	576610 0009	509,-
0-16 kN	500 N	75	34	63	30	576610 0010	509,-
0-25 kN	500 N	75	34	63	30	576610 0011	509,-
0-40 kN	1 kN	75	34	63	30	576610 0012	509,-
0-63 kN	1 kN	90	55	63	32	576610 0013	569,-
0-100 kN	1 kN	90	55	63	32	576610 0014	569,-
0-160 kN	5 kN	145	112	63	38	576610 0015	759,-
0-250 kN	5 kN	145	112	63	38	576610 0016	759,-
0-400 kN	10 kN	145	112	63	38	576610 0017	759,-
0-630 kN	10 kN	145	112	63	38	576610 0018	759,-

5171



## Digital force measuring devices

### Model FK

- Robust device for measuring tensile and compressive force
- Reliable operation thanks to ergonomic casing
- Attachment for all SAUTER test stands on the back
- Display switches automatically depending on direction of use
- Peak-hold function for recording peak values
- Track function for continuous measurement
- Measuring frequency 1,000 Hz
- Measurement uncertainty 0.5% (of max. value)
- Overload protection 200 %
- Automatic switch-off
- Battery operation
- Selectable units: N, kg, lb, oz
- Dimensions: Length 195 x width 84 x height 35 mm, weight: 600 g
- Supplied with batteries, mains adapter, one of each attachment: Hooked, pointed, V-shaped, blade and flat, and one 90 mm extension bar
- Measurement ranges of 10, 25 and 50 N available on request







Measurement range N	Resolution N	art.no.	€
100	0.05	<b>576631 0100</b>	255,-
250	0.10	576631 0250	255,-
500	0.20	576631 0500	255,-
1000	0.50	576631 1000	255,-

5171



## Scales quick finder

INFO

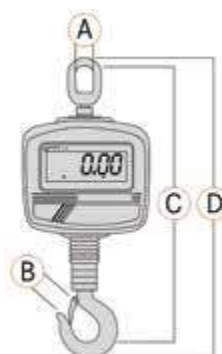
Reading g	Weighing range max. kg	Design	Article no.	Page				RS232C	
0,001	0,1	Precision scales	578031 0100	1494	•			•	
0,001	0,25	Precision scales	578031 0250	1494	•			•	
0,01	0,2	Precision scales	578031 0200	1494	•			•	
0,01	0,2	Compact scales	578026 0001	1493					
0,01	2,5	Precision scales	578031 2500	1484	•			•	
0,1	1	Precision scales	578031 1000	1494	•			•	
0,1	1,2	Compact scales	578026 1200	1493					
0,1	2	Precision scales	578031 2000	1494	•			•	
0,1	6	Precision scales	578031 6001	1494	•			•	
0,1	6	Compact scales	578026 6000	1493					
0,1	6	Counting scales	578057 0002	1493	•	optional		•	•
0,1	30	Counting system	578058 0030	1493	•			•	•
0,1	60	Counting system	578058 0060	1493	•			•	•
0,1	60	Counting system	578058 0061	1493	•			•	•
0,1	150	Counting system	578058 0150	1493	•			•	•
0,1	150	Counting system	578058 0151	1493	•			•	•
0,1	300	Counting system	578058 0300	1493	•			•	•
0,2	15	Counting scales	578057 0003	1493	•	optional		•	•
0,5	30	Counting scales	578057 0004	1493	•	optional		•	•
1	2,2	Compact scales	578026 0003	1493					
1	6	Precision scales	578031 6000	1494	•			•	•
1/2	3/6	Platform scales	578052 0060	1495	•			•	IP 65
2/5	6/15	Platform scales	578052 0150	1495	•			•	IP 65
5	5,2	Compact scales	578026 0004	1493					
5	15	Platform scales	578042 0012	1494				•	
5/10	15/35	Platform scales	578052 0350	1495	•			•	IP 65
10	35	Platform scales	578042 0001	1494				•	
10/20	30/60	Platform scales	578052 0600	1495	•			•	IP 65
20	60	Platform scales	578042 0002	1494				•	
20/50	60/150	Platform scales	578052 1500	1495	•			•	IP 65
20	60	Hanging scales	578034 2060	1492		•			
50	150	Platform scales	578042 0003	1494				•	
50/100	150/300	Platform scales	578052 3000	1495	•			•	IP 65
100	300	Platform scales	578042 0004	1494				•	
50	150	Hanging scales	578034 2150	1492		•			
100	300	Hanging scales	578034 2300	1492		•			
50	600	Crane scales	578036 0006	1492		•		•	
100	1.500	Crane scales	578036 0015	1492		•		•	
200	3.000	Crane scales	578036 0030	1492		•		•	
500	6.000	Crane scales	578036 0060	1492		•		•	
1.000	12.000	Crane scales	578036 0120	1492		•		•	



## KERN Crane scales HCD



- High-resolution crane scale
- Rotating hook with safety lock
- Functions conveniently accessed via radio remote control, range approx. 20 m
- Data hold function: if the scales are left idle, the weight displayed will automatically freeze until the hold button is pressed
- Tare: resets the display to "0" while a load is on the scales so that any loads removed or added are displayed directly
- **Technical data:**
  - Backlit LCD display with 28 mm high digits
  - Battery operation, 4 x 1.5 V LR6 AA approx. 100 hours
  - Casing dimensions 65 x 24 x 100 mm
  - Operating temperature 5-35 °C
- Calibration according to DAkkS
- Supplied with remote control and batteries



Model	Reading g	Weighing range max. kg	A mm	B mm	C mm	D mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
HCD	20	60	26	23.5	246.5	276.5	0.85	576034 2060	198,50	079401 0012	116,-
HCD	50	150	26	23.5	246.5	276.5	0.85	576034 2150	198,50	079401 0012	116,-
HCD	100	300	26	23.5	246.5	276.5	0.85	576034 2300	198,50	079401 0012	116,-

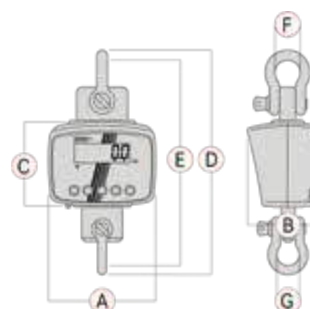
5174

## KERN Crane scale HFD

NEW



- high-resolution crane scales up to 12 tons
- robust design
- supports SOLAS-compliant weighing of freight
- Data Hold function: if the scales are left idle, the displayed weight will automatically freeze until the hold button is pressed
- Functions conveniently accessed via radio remote control, range approx. 20m
- Reading switches automatically as loads get heavier
- Internal battery, 70-hour operating time (without backlight)
- Housing dimensions 194 x 129 x 145mm
- Operating temperature -10 to 40°C
- Supplied with remote control without safety hooks



Weighing range max. kg	Reading mm	D mm	E mm	F mm	G mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
600	50/100/200	421	383	50.8	50.8	9	578036 0006	380,-	079401 0013	165,-
1500	100/200/500	421	383	50.8	50.8	9	578036 0015	390,-	079401 0013	165,-
3000	200/500/1000	421	383	50.8	50.8	10	578036 0030	609,-	079401 0015	440,-
6000	500/1000/2000	477	426	68.3	68.3	15	578036 0060	659,-	079401 0015	440,-
12000	1000/2000/5000	573	510	82.5	82.5	20	578036 0120	779,-	079401 0017	500,-

5174

### Hook with safety lock for crane scale HFD

Designation	suitable for	art.no.	€
Hook with safety lock	Crane scale HDF 600/1500 kg	578036 5001	45,80
Hook with safety lock	Crane scale HDF 3000 kg	578036 5002	61,10
Hook with safety lock	Crane scale HDF 6000/12000 kg	578036 5003	102,-

5174

### Bluetooth data interface

- allows wireless data transfer to PC or tablet
- **WARNING! Cannot be retrofitted!**

Designation	art.no.	€
Bluetooth data interface	567515 0001	214,-

5174

## KERN Compact electronic scales EMB

0.00

TARE

- 2-key operation
- Large LCD display, digit height 15 mm
- **Tare:** Additive or subtractive weighing
- Dimensions 240 x 170 x 39 mm
- Universal power supply available on request
- DAkkS calibration
- Supplied with 2x LR6 batteries, no. 548079 4006

Reading g	Weighing range max. kg	Weighing plate Ø mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
0.01	0.2	105	0.5	578026 0001	127,50	079401 0010	78,-
0.1	1.2	150	0.5	578026 1200	79,40	079401 0010	78,-
1	2.2	150	0.5	578026 0003	58,-	079401 0010	78,-
5	5.2	150	0.5	578026 0004	56,-	079401 0011	94,-
0.1	6.0	150	0.5	578026 6000	163,-	079401 0011	94,-

5174



578026 6000

## KERN Counting scales CPB

0.00

TARE

PCS

230 V

RS232C

- Professional counting and weighing
- 3 displays: Unit weight, total weight and total unit quantity
- Large LCD display, digit height 20 mm
- Battery and mains operation
- Battery charge status indicator
- 225 x 294 mm stainless steel weighing platform
- Dimensions, width x depth x height = 320 x 350 x 125 mm
- Weight 3.9 kg
- DAkkS calibration
- Supplied with mains adapter, no battery

Reading g	Weighing range max. kg	Unit weight (counted) min. g	art.no.	€	DAkkS calibration art.no.	€
0.1	6	0.10	578057 0002	229,-	079401 0011	94,-
0.2	15	0.25	578057 0003	229,-	079401 0011	94,-
0.5	30	0.50	578057 0004	229,-	079401 0011	94,-

5174



578057 0002

## KERN Counting system CCS

0.00

TARE

PCS

230 V

RS232C

- Comprising quantity scales (platform scales) and reference scales
- Stainless steel weighing plates
- Quantity scales with IP65 weighing cells
- Reference scales can also be used separately as counting scales
- Large, backlit LCD display with 20 mm high digits
- Precise counting by means of automated reference optimisation, which gradually improves the average value of the part weight
- DAkkS calibration
- Supplied with mains adapter



Model	Weighing range max. kg	Reading g	Unit weight (counted) min. g	Weighing plate mm	art.no.	€	DAkkS calibration art.no.	€
CCS 30K0,1	30	10	0.1	400 x 300 x 128	578058 0030	499,-	079401 0020	188,-
CCS 60K0,1	60	20	0.1	400 x 300 x 128	578058 0060	509,-	079401 0021	210,-
CCS 60K0,1L	60	20	0.1	500 x 400 x 137	578058 0061	579,-	079401 0021	210,-
CCS 150K0,1	150	50	0.1	500 x 400 x 137	578058 0150	549,-	079401 0021	210,-
CCS 150K0,1L	150	50	0.1	650 x 500 x 142	578058 0151	839,-	079401 0021	210,-
CCS 300K0,1	300	100	0.1	650 x 500 x 142	578058 0300	809,-	079401 0021	210,-

5174

## KERN Precision scales PCB



- Simple, self-explanatory 5-key operation
- Option to switch between mains/battery operation
- Backlit LCD display with 15 mm high digits
- Settling time 3 sec.
- **Calibration program (CAL):** for accuracy adjustment, optional external calibration weight required
- **Unit counting:** 5, 10, 25 and 50 unit reference counts available
- Display can be switched between units and weight
- **Formulation:** separate memory for the weight of the tare container and formulation components (net total)
- Battery operation (optional): 6LR61, with automatic switch-off
- Dimensions: 163 x 245 x 79 mm
- DAkkS calibration
- Supplied with power supply, no battery



578031 6001

Weighing range max. g	Reading g	Unit weight (counted) min. g	Weighing plate mm	art.no.	€	DAkkS calibration art.no.	€
100	0.001	0.002	Ø 81	578031 0100	270,-	079401 0010	78,-
200	0.01	0.02	Ø 105	578031 0200	234,-	079401 0010	78,-
250	0.001	0.002	Ø 81	578031 0250	295,-	079401 0010	78,-
1000	0.1	0.2	130 x 130	578031 1000	188,50	079401 0010	78,-
2000	0.1	0.2	130 x 130	578031 2000	219,-	079401 0010	78,-
2500	0.01	0.02	130 x 130	578031 2500	295,-	079401 0010	78,-
6000	0.1	0.2	170 x 150	578031 6001	245,-	079401 0011	94,-
6000	1	2	170 x 150	578031 6000	163,-	079401 0011	94,-

5174

## KERN Platform scales EOB



- Package scales for shipping
- Easy to operate, with four buttons
- Large LCD display, 25 mm high digits
- Display unit can be freely positioned, flexible 1.8 m cable
- Mains power and optional battery operation (6x LR6/AA) available
- Battery operation: with automatic switch-off (after 3 min.)
- DAkkS calibration
- Supplied with power supply, no battery
- Versions with larger weighing platforms available on request



578042 0004

Reading g	Weighing range max. kg	Weighing plate WxDxH mm	Display unit W x D x H mm	art.no.	€	DAkkS calibration art.no.	€
5	15	315 x 305 x 65	210 x 110 x 45	578042 0012	155,-	079401 0011	94,-
10	35	315 x 305 x 65	210 x 110 x 45	578042 0001	155,-	079401 0011	94,-
20	60	315 x 305 x 65	210 x 110 x 45	578042 0002	155,-	079401 0012	116,-
50	150	315 x 305 x 65	210 x 110 x 45	578042 0003	155,-	079401 0012	116,-
100	300	315 x 305 x 65	210 x 110 x 45	578042 0004	155,-	079401 0012	116,-

5174

## KERN Platform scales DE-D



- Package, industrial and counting scales in one instrument
- Dual-range scales, resolution automatically adapted to the weighing range
- Large LCD display, digit height 25 mm
- Display unit (225 x 110 x 45 mm) with approx. 1.4 m connection cable
- Wall bracket for display unit optional
- Optional stand also available for raising the display unit
- Option to switch between mains/battery operation
- Settling time 2 - 3 sec.
- **Unit counting:** 5, 10, 25 and 50 unit reference counts available
- Display can be switched between units and weight
- **Formulation:** Separate memory for the weight of the tare container and formulation components (net total)
- DAkkS calibration
- Supplied with power supply, no battery



578052 3000

Reading g	Weighing range max. kg	Unit weight (counted) min. g	Weighing plate mm	H x W x D mm	Weight kg	art.no.	€	DAkkS calibration art.no.	€
1 / 2	3 / 6	4	318 x 308 x75	45 x 225 x 110	4	578052 0060	188,50	079401 0012	116,-
2 / 5	6 / 15	10	318 x 308 x75	45 x 225 x 110	4	578052 0150	188,50	079401 0011	94,-
5 / 10	15 / 35	10	318 x 308 x75	45 x 225 x 110	4	578052 0350	188,50	079401 0011	94,-
10 / 20	30 / 60	20	318 x 308 x75	45 x 225 x 110	4	578052 0600	188,50	079401 0011	94,-
20 / 50	60 / 150	40	318 x 308 x75	45 x 225 x 110	4	578052 1500	198,50	079401 0012	116,-
50 / 100	150 / 300	10	522 x 403 x 90	45 x 225 x 110	16	578052 3000	321,-	079401 0012	116,-

5174

### Accessories

Description	art.no.	€
Device holder	578053 0001	35,60
Column, height approx. 450 mm	578053 0003	102,-
Wall bracket	578053 0002	30,60

5174



Shown with column




# Workshop supplies

## Screw tools

	Single open-end spanner		1498
	Double open-ended spanner, ring spanner	<b>NEW</b>	1498
	Face spanner Tyre lever		1502
	Hexagonal Offset screwdriver		1503
	Offset screwdriver colour-coded	<b>NEW</b>	1504
	Offset screwdriver 100°	<b>NEW</b>	1504
	TORX- Offset screwdriver		1505
	Screwdriver with flag handle		1506
	Screwdriver with T-handle		1507
	Screwdrivers		1508
	Screwdriver in hand-held fold-out holder		1509
	Bit holders and inserts		1510
	Sockets and inserts		1514


## Torque tools

	Torque screwdrivers		1519
	Torque limiter	<b>NEW</b>	1520
	Torque wrench		1522

## Cutting and striking tools

	Pliers and VDE pliers		1523
	Snap-ring and Electronics pliers		1527
	Knives and cutters		1528
	Centre punches, pin punches and Wad punches		1529
	Hammers		1531



## Saws

	Metal saws, hand-saw and jig-saw blades		1532
--	--	--	------


## Labelling devices

	Screw clamps		1532
	Steel types and hand punches		1533

## Chemical products and cleaning

	Hand-lever pressure grease gun		1535
	PIG repair putty		1535
	Paper tissue rolls and cleaning cloths		1536

## Deburring tools

	Deburring tools and scrapers		1537
	Deburring tool sets		1543







## Batteries and rechargeable batteries / lamps

	Batteries	1545
	Lights	1545
	LED workplace light <b>NEW</b>	1546
	LED light strips <b>NEW</b>	1546

## Chip removal

	Chip hooks Magnetic chip collector	1547
	Magnetic chip broom <b>NEW</b>	1547

## Machine damping

	Machine shoes	1548
	Damping mats	1550

## Pneumatic tools

	Compressed air equipment	1551
	Pneumatic die grinder <b>NEW</b>	1551
	Pneumatic blow guns	1554
	Pneumatic accessories	1555

## Gloves

	Assembly gloves <b>NEW</b>	1559
	Cut-resistant gloves <b>NEW</b>	1560

# EVERYTHING FOR SCREWDRIVERS



WIHA  
Hand tools  
361 pages  
Art.no. 019900 5548

Overview of all free manufacturers' catalogues  
on page 16/17



## Single open-end spanner

**DIN  
894**

- Jaw position 15°, robust handle, die-forged
- Up to size 75 mm = black  
Size 80 mm upwards = steel grey

Wr. width	L mm	art.no.	€
6 mm	75	700160 0006	1,38
7 mm	80	700160 0007	1,42
8 mm	95	700160 0008	1,42
9 mm	100	700160 0009	1,51
10 mm	105	700160 0010	1,46
12 mm	125	700160 0012	1,76
13 mm	135	700160 0013	1,76
14 mm	140	700160 0014	1,76
15 mm	147	700160 0015	1,99
17 mm	151	700160 0017	1,68
19 mm	170	700160 0019	2,08
22 mm	195	700160 0022	2,61

7101

Wr. width	L mm	art.no.	€
24 mm	215	700160 0024	3,35
25 mm	230	700160 0025	4,90
27 mm	240	700160 0027	3,84
30 mm	260	700160 0030	4,73
32 mm	275	700160 0032	5,15
36 mm	305	700160 0036	6,70
41 mm	340	700160 0041	8,40
46 mm	380	700160 0046	9,85
50 mm	410	700160 0050	12,95
55 mm	440	700160 0055	14,80
60 mm	477	700160 0060	26,50
65 mm	510	700160 0065	31,80

7101



## ATORN® Double open-end spanner

**NEW**
**DIN  
3110**

- **new surface**
- Ultra-resistant to contact corrosion
- **15-times greater corrosion protection against temperature, de-icing salt and climate loads compared with conventional coated keys**
- up to 720 hours in the salt spray test in compliance with DIN EN ISO 9227
- environmentally-friendly chromium-free coating process
- Chrome vanadium steel, die-forged and hardened

### Single

Wr. width	L mm	art.no.	€
5.5 x 7 mm	124	700140 5507	3,38
6 x 7 mm	125	700140 0607	2,80
8 x 9 mm	140	700140 0809	3,02
8 x 10 mm	144	700140 0810	3,48
10 x 11 mm	159	700140 1011	3,17
10 x 13 mm	173	700140 1013	4,21
11 x 13 mm	173	700140 1113	4,47
12 x 13 mm	173	700140 1213	3,74
12 x 14 mm	178	700140 1214	4,47
13 x 14 mm	186	700140 1314	4,57
13 x 15 mm	188	700140 1315	4,62
13 x 17 mm	191	700140 1317	4,94

7102

Wr. width	L mm	art.no.	€
14 x 15 mm	191	700140 1415	4,10
14 x 17 mm	192	700140 1417	5,05
16 x 17 mm	201	700140 1617	4,36
16 x 18 mm	201	700140 1618	5,60
17 x 19 mm	204	700140 1719	5,40
18 x 19 mm	220	700140 1819	5,20
19 x 22 mm	236	700140 1922	6,45
19 x 24 mm	236	700140 1924	7,30
20 x 22 mm	237	700140 2022	6,05
21 x 23 mm	239	700140 2123	6,90
22 x 24 mm	248	700140 2224	7,30
24 x 26 mm	247	700140 2426	8,50

7102



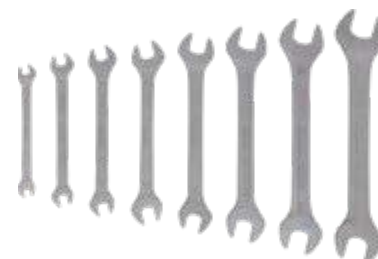
Wr. width	L mm	art.no.	€
24 x 27 mm	263	700140 2427	8,10
25 x 28 mm	280	700140 2528	10,80
27 x 30 mm	280	700140 2730	11,85
27 x 32 mm	292	700140 2732	11,85
30 x 32 mm	295	700140 3032	11,20
32 x 36 mm	310	700140 3236	19,75
34 x 36 mm	332	700140 3436	25,60
36 x 41 mm	352	700140 3641	26,-
41 x 46 mm	421	700140 4146	35,10

7102

### Sets, boxed

Contents	Wr. width	art.no.	€
8-pcs.	6 x 7 mm   8 x 9 mm   10 x 11 mm   12 x 13 mm   14 x 15 mm   16 x 17 mm   18 x 19 mm   20 x 22 mm	700145 1008	32,-
10-pcs.	6 x 7 mm   8 x 9 mm   10 x 11 mm   12 x 13 mm   14 x 15 mm   16 x 17 mm   18 x 19 mm   20 x 22 mm   24 x 27 mm   30 x 32 mm	700145 1010	47,50
12-pcs.	6 x 7 mm   8 x 9 mm   10 x 11 mm   12 x 13 mm   14 x 15 mm   16 x 17 mm   18 x 19 mm   20 x 22 mm   21 x 23 mm   24 x 27 mm   25 x 28 mm   30 x 32 mm	700145 1012	67,70

7102



## ATORN® Combination spanner (15° angled ring end)

NEW

DIN  
3113AISO  
3318

- 12-point **energy profile** ring head
- 15° angled ring end
- **new surface**
- Ultra-resistant to contact corrosion
- **15-times greater corrosion protection against temperature, de-icing salt and climate loads compared with conventional coated keys**
- up to 720 hours in the salt spray test in compliance with DIN EN ISO 9227
- environmentally-friendly chromium-free coating process
- Chrome vanadium steel, die-forged and hardened



### Single

Wr. width	L mm	art.no.	€
5 mm	90	700510 0005	4,72
5.5 mm	92	700510 0055	4,72
6 mm	100	700510 0006	4,42
7 mm	110	700510 0007	4,36
8 mm	120	700510 0008	4,31
9 mm	130	700510 0009	4,88
10 mm	140	700510 0010	4,88
11 mm	150	700510 0011	5,40
12 mm	160	700510 0012	5,60
13 mm	170	700510 0013	6,05
14 mm	180	700510 0014	6,05

7102

Wr. width	L mm	art.no.	€
15 mm	190	700510 0015	7,30
16 mm	190	700510 0016	7,90
17 mm	210	700510 0017	7,90
18 mm	210	700510 0018	8,90
19 mm	230	700510 0019	8,90
20 mm	230	700510 0020	11,-
21 mm	260	700510 0021	11,40
22 mm	260	700510 0022	11,40
23 mm	270	700510 0023	13,30
24 mm	280	700510 0024	12,90
25 mm	280	700510 0025	15,60

7102

Wr. width	L mm	art.no.	€
26 mm	290	700510 0026	15,80
27 mm	310	700510 0027	16,-
28 mm	310	700510 0028	18,35
30 mm	340	700510 0030	18,95
32 mm	360	700510 0032	21,-
34 mm	420	700510 0034	25,40
36 mm	460	700510 0036	36,40
41 mm	480	700510 0041	81,90
46 mm	500	700510 0046	110,-

7102

### Sets, boxed

Contents	Wr. width	art.no.	€
9-pcs.	8 mm   10 mm   13 mm   14 mm   15 mm   16 mm   17 mm   18 mm   19 mm	700511 0009	54,-
12-pcs.	6 mm   7 mm   8 mm   9 mm   10 mm   11 mm   12 mm   13 mm   14 mm   15 mm   16 mm   17 mm	700511 0012	86,-
12-pcs.	10 mm   11 mm   12 mm   13 mm   14 mm   17 mm   19 mm   22 mm   24 mm   27 mm   30 mm   32 mm	700511 1012	128,50
18-pcs.	6 mm   7 mm   8 mm   9 mm   10 mm   11 mm   12 mm   13 mm   14 mm   15 mm   16 mm   17 mm   18 mm   19 mm   20 mm   21 mm   22 mm   24 mm	700511 0018	128,50

7102



WHATEVER  
**THE**  
SCREWING TASK:  
**PROFESSIONAL**  
TOOL SOLUTIONS



STAHlwille  
Hand tools  
401 pages  
Art.no. 019900 5633

Overview of all free manufacturers' catalogues  
on page 16/17



## ATORN® Combination spanner (offset ring end)

NEW

DIN  
3113B

ISO  
3318

- 12-point **energy profile** ring head
- offset ring end
- **new surface**
- Ultra-resistant to contact corrosion
- **15-times greater corrosion protection against temperature, de-icing salt and climate loads compared with conventional coated keys**
- up to 720 hours in the salt spray test in compliance with DIN EN ISO 9227
- environmentally-friendly chromium-free coating process
- Chrome vanadium steel, die-forged and hardened

### Single

Wr. width	L mm	art.no.	€
5 mm	95	700517 0005	6,25
5.5 mm	100	700517 0055	6,25
6 mm	100	700517 0006	5,80
7 mm	115	700517 0007	5,80
8 mm	125	700517 0008	5,80
9 mm	140	700517 0009	6,45
10 mm	145	700517 0010	6,45
11 mm	160	700517 0011	7,10

7102

Wr. width	L mm	art.no.	€
12 mm	165	700517 0012	7,30
13 mm	180	700517 0013	7,90
14 mm	190	700517 0014	7,90
15 mm	190	700517 0015	9,40
16 mm	220	700517 0016	10,20
17 mm	230	700517 0017	10,40
18 mm	245	700517 0018	11,60
19 mm	260	700517 0019	12,30

7102



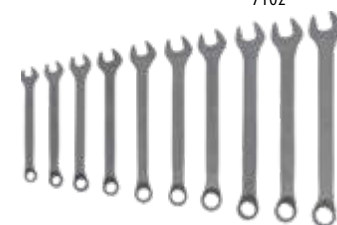
Wr. width	L mm	art.no.	€
20 mm	270	700517 0020	14,35
21 mm	280	700517 0021	14,95
22 mm	290	700517 0022	14,95
24 mm	320	700517 0024	16,60
27 mm	350	700517 0027	20,80
30 mm	390	700517 0030	24,80
32 mm	410	700517 0032	27,20
36 mm	430	700517 0036	45,30

7102

### Sets, boxed

Contents	Wr. width	art.no.	€
10-pcs.	8 mm   9 mm   10 mm   11 mm   12 mm   13 mm   14 mm   15 mm   16 mm   17 mm	700518 0010	77,90
12-pcs.	10 mm   11 mm   12 mm   13 mm   14 mm   17 mm   19 mm   22 mm   24 mm   27 mm   30 mm   32 mm	700518 0012	168,-
18-pcs.	6 mm   7 mm   8 mm   9 mm   10 mm   11 mm   12 mm   13 mm   14 mm   15 mm   16 mm   17 mm   18 mm   19 mm   20 mm   21 mm   22 mm   24 mm	700518 0018	166,-

7102



## ATORN® Double-end ring spanner

NEW

DIN  
838

- **new surface**
- Ultra-resistant to contact corrosion
- **15-times greater corrosion protection against temperature, de-icing salt and climate loads compared with conventional coated keys**
- up to 720 hours in the salt spray test in compliance with DIN EN ISO 9227
- environmentally-friendly chromium-free coating process
- Chrome vanadium steel, die-forged and hardened
- **ENERGY profile**

### Single

Wr. width	L mm	art.no.	€
6 x 7 mm	178	700155 0607	5,80
8 x 9 mm	195	700155 0809	5,80
8 x 10 mm	195	700155 0810	7,50
10 x 11 mm	200	700155 1011	6,45
10 x 13 mm	220	700155 1013	7,90
12 x 13 mm	220	700155 1213	6,90
12 x 14 mm	220	700155 1214	7,90
13 x 14 mm	220	700155 1314	7,90
13 x 15 mm	225	700155 1315	8,30
13 x 17 mm	250	700155 1317	9,20

7102

Wr. width	L mm	art.no.	€
14 x 15 mm	235	700155 1415	7,30
14 x 17 mm	250	700155 1417	8,70
16 x 17 mm	250	700155 1617	8,10
16 x 18 mm	250	700155 1618	9,80
17 x 19 mm	285	700155 1719	9,60
18 x 19 mm	285	700155 1819	9,40
19 x 22 mm	300	700155 1922	11,85
19 x 24 mm	300	700155 1924	16,-
20 x 22 mm	300	700155 2022	10,80
21 x 23 mm	300	700155 2123	13,50

7102



Wr. width	L mm	art.no.	€
22 x 24 mm	320	700155 2224	14,75
24 x 26 mm	330	700155 2426	16,20
24 x 27 mm	330	700155 2427	14,10
25 x 28 mm	345	700155 2528	18,75
27 x 32 mm	360	700155 2732	19,15
30 x 32 mm	360	700155 3032	18,55
32 x 36 mm	400	700155 3236	22,20
36 x 41 mm	440	700155 3641	45,70

7102

### Sets, boxed

Contents	Wr. width	art.no.	€
8-pcs.	6 x 7   8 x 9   10 x 11   12 x 13   14 x 15 mm   16 x 17 mm   18 x 19 mm   20 x 22 mm	700150 0008	60,10
12-pcs.	6 x 7 mm   8 x 9 mm   10 x 11 mm   10 x 13 mm   12 x 13 mm   14 x 15 mm   16 x 17 mm   18 x 19 mm   20 x 22 mm   21 x 23 mm   24 x 27 mm   25 x 28 mm   30 x 32 mm	700150 0012	120,50

7102



## ATORN® Ratcheting combination spanner

- Ratchet with 72 teeth, 5° start angle
- Material: Chrome vanadium, chrome-plated
- **Caution: Do not use ring end for tightening**

### Straight version, individual

Wr. width	art.no.	€	Wr. width	art.no.	€	Wr. width	art.no.	€
6 mm	700110 0006	10,20	14 mm	700110 0014	13,65	24 mm	700110 0024	27,90
7 mm	700110 0007	10,20	15 mm	700110 0015	14,25	27 mm	700110 0027	32,20
8 mm	700110 0008	10,80	16 mm	700110 0016	14,85	30 mm	700110 0030	37,90
9 mm	700110 0009	11,-	17 mm	700110 0017	15,90	32 mm	700110 0032	42,40
10 mm	700110 0010	11,20	18 mm	700110 0018	16,50	34 mm	700110 0034	71,20
11 mm	700110 0011	11,40	19 mm	700110 0019	17,10	36 mm	700110 0036	85,50
12 mm	700110 0012	12,05	21 mm	700110 0021	22,-	38 mm	700110 0038	99,70
13 mm	700110 0013	12,45	22 mm	700110 0022	22,80	41 mm	700110 0041	161,-
7102			7102			7102		

### Straight, set

Description	Contents	Wr. width	art.no.	€
In a roll-up case	5-pcs.	8 mm   10 mm   13 mm   17 mm   19 mm	700110 1005	67,20
7102				

### Reversible, 15° angled ring end, individual

Wr. width	art.no.	€	Wr. width	art.no.	€	Wr. width	art.no.	€
6 mm	700111 0006	14,85	13 mm	700111 0013	18,75	21 mm	700111 0021	37,10
7 mm	700111 0007	14,85	14 mm	700111 0014	21,-	22 mm	700111 0022	37,10
8 mm	700111 0008	16,10	15 mm	700111 0015	21,60	24 mm	700111 0024	42,80
9 mm	700111 0009	16,30	16 mm	700111 0016	22,60	27 mm	700111 0027	61,10
10 mm	700111 0010	16,90	17 mm	700111 0017	24,10	30 mm	700111 0030	75,30
11 mm	700111 0011	17,50	18 mm	700111 0018	26,10	32 mm	700111 0032	76,30
12 mm	700111 0012	18,55	19 mm	700111 0019	26,50	36 mm	700111 0036	122,50
7102			7102			7102		

### Reversible, 15° angled ring end, set

Description	Contents	Wr. width	art.no.	€
In a roll-up case	5-pcs.	8 mm   10 mm   13 mm   17 mm   19 mm	700111 1005	98,70
7102				

### With articulated head, individual

Wr. width	art.no.	€	Wr. width	art.no.	€	Wr. width	art.no.	€
8 mm	700112 0008	17,90	12 mm	700112 0012	19,75	16 mm	700112 0016	24,70
9 mm	700112 0009	18,15	13 mm	700112 0013	20,20	17 mm	700112 0017	25,10
10 mm	700112 0010	18,55	14 mm	700112 0014	21,20	18 mm	700112 0018	26,10
11 mm	700112 0011	19,15	15 mm	700112 0015	22,-	19 mm	700112 0019	27,50
7102			7102			7102		

### With articulated head, set

Description	Contents	Wr. width	art.no.	€
In a roll-up case	5-pcs.	8 mm   10 mm   13 mm   17 mm   19 mm	700112 1005	118,-
7102				

### Dual-sided ratchet function, individual

Wr. width	art.no.	€	Wr. width	art.no.	€
8 mm	700115 0108	14,85	17 mm	700115 0117	21,60
10 mm	700115 0110	15,30	19 mm	700115 0119	23,-
13 mm	700115 0113	17,30			
7102			7102		

### Dual-sided ratchet function, set

Description	Contents	Wr. width	art.no.	€
In a pouch	5-pcs.	8 mm   10 mm   13 mm   17 mm   19 mm	700115 0205	98,70
7102				



## ATORN® Adapter for ratcheting combination spanners

- Suitable for straight versions and articulated head versions

Adapter	suitable for wr. width mm	art.no.	€
1/4 inch hexagonal bits	10	<b>700113 0001</b>	<b>9,60</b>
1/4 inch square nuts	10	700113 0002	<b>2,80</b>
3/8 inch square nuts	13	700113 0003	<b>11,60</b>
1/2 inch square nuts	19	700113 0004	<b>13,05</b>
7102			



## AMF® Face spanner

- **Adjustable face wrench with electrically welded pins**
- Special steel, tempered to a burnished shade

### Individual

Pin Ø mm	Adjusting range pin removal mm	Pin length mm	Total length mm	art.no.	€
3	11 - 60	4	160	<b>701570 0003</b>	<b>10,05</b>
4	11 - 60	5	160	701570 0004	<b>10,10</b>
5	14 - 100	6	215	701570 0005	<b>14,50</b>
6	14 - 100	7	215	701570 0006	<b>14,55</b>
8	14 - 100	8	215	701570 0008	<b>15,20</b>
4159					

### Set with replaceable pins (two sets per size)

- Special steel, hardened and galvanised
- Replaces five individual spanner sizes (Ø 1.5 / 2 / 2.5 / 3 / 4 mm)
- Supplied in a robust two-component box

Wr. width mm	Weight kg	art.no.	€
8 - 100	335	<b>701571 0001</b>	<b>41,50</b>
4159			



## Tyre lever

- Profiled, die-forged
- Chrome vanadium steel, chrome-plated

### Straight

L mm	art.no.	€
300	<b>701535 0300</b>	<b>8,15</b>
400	701535 0400	<b>12,35</b>
500	701535 0500	<b>16,-</b>
600	701535 0600	<b>24,40</b>
7101		



### Offset version

L mm	art.no.	€
400	<b>701536 0400</b>	<b>31,20</b>
500	701536 0500	<b>32,50</b>
600	701536 0600	<b>42,10</b>
7101		

Over 200,000 tools available online!  
Register online now!

[www.saratools.com](http://www.saratools.com)





## ATORN® Hexagonal offset screwdriver

- For hexagonal socket head screws
- Hardness and torque in accordance with ISO 2936 or ISO 2936L
- Chamfered key ends
- **Material:** high-quality chrome vanadium steel (59CrMoV4), black oiled or nickel-plated



### Short version, ISO 2936

Wr. width	Limb length	Black, oiled art.no.	€	Nickel-plated art.no.	€
0.7 mm	33 x 7 mm	703001 0007	0,52		
0.9 mm	33 x 11 mm	703001 0009	0,52		
1.3 mm	41 x 13 mm			703005 0013	0,39
1.5 mm	46.5 x 15.5 mm	703001 0015	0,26	703005 0015	0,39
2.0 mm	52 x 18 mm	703001 0020	0,26	703005 0020	0,39
2.5 mm	58.5 x 20.5 mm	703001 0025	0,29	703005 0025	0,39
3.0 mm	66 x 23 mm	703001 0030	0,35	703005 0030	0,39
3.5 mm	69.5 x 25.5 mm	703001 0035	0,39	703005 0035	0,52
4.0 mm	74 x 29 mm	703001 0040	0,42	703005 0040	0,52
4.5 mm	80 x 30.5 mm	703001 0045	0,59	703005 0045	0,69
5.0 mm	85 x 33 mm	703001 0050	0,59	703005 0050	0,63
5.5 mm	90.5 x 35.5 mm	703001 0055	0,77	703005 0055	0,94
6.0 mm	96 x 38 mm	703001 0060	0,74	703005 0060	0,73
7.0 mm	102 x 41 mm	703001 0070	0,99	703005 0070	0,92
		7111		7111	

Wr. width	Limb length	Black, oiled art.no.	€	Nickel-plated art.no.	€
8.0 mm	108 x 44 mm	703001 0080	1,19	703005 0080	1,15
9.0 mm	114 x 47 mm	703001 0090	1,85	703005 0090	1,78
10.0 mm	122 x 50 mm	703001 0100	1,88	703005 0100	1,78
11.0 mm	129 x 53 mm	703001 0110	2,06	703005 0110	1,99
12.0 mm	137 x 57 mm	703001 0120	2,30	703005 0120	2,19
14.0 mm	154 x 70 mm	703001 0140	3,85	703005 0140	3,67
17.0 mm	177 x 80 mm	703001 0170	6,90	703005 0170	6,45
19.0 mm	199 x 89 mm	703001 0190	9,40	703005 0190	8,75
22.0 mm	222 x 102 mm	703001 0220	13,20	703005 0220	12,15
24.0 mm	248 x 114 mm	703001 0240	19,65	703005 0240	18,45
27.0 mm	277 x 127 mm	703001 0270	31,30	703005 0270	28,40
30.0 mm	315 x 142 mm			703005 0300	39,30
32.0 mm	347 x 157 mm			703005 0320	57,-
36.0 mm	391 x 176 mm			703005 0360	76,30
		7111		7111	

### Extra-long, ISO 2936 L

Wr. width mm	Limb length	Black, oiled art.no.	€	Nickel-plated art.no.	€
2.0 mm	102 x 18 mm	703010 0020	0,50	703015 0020	0,52
2.5 mm	114.5 x 20.5 mm	703010 0025	0,56	703015 0025	0,63
3.0 mm	129 x 23 mm	703010 0030	0,62	703015 0030	0,73
4.0 mm	144 x 29 mm	703010 0040	0,85	703015 0040	0,91
5.0 mm	165 x 33 mm	703010 0050	1,02	703015 0050	1,01
6.0 mm	186 x 38 mm	703010 0060	1,34	703015 0060	1,43
		7111		7111	

Wr. width mm	Limb length	Black, oiled art.no.	€	Nickel-plated art.no.	€
8.0 mm	208 x 44 mm	703010 0080	1,92	703015 0080	1,89
10.0 mm	234 x 50 mm	703010 0100	3,06	703015 0100	2,70
12.0 mm	262 x 57 mm	703010 0120	4,28	703015 0120	3,36
14.0 mm	294 x 70 mm	703010 0140	7,10	703015 0140	5,05
17.0 mm	337 x 80 mm	703010 0170	11,40	703015 0170	9,50
19.0 mm	379 x 89 mm	703010 0190	16,70	703015 0190	12,15
		7111		7111	



### Sets

ISO design	Wr. width mm	Design	Black, oiled art.no.	€	Nickel-plated art.no.	€
2936	2 mm / 2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm / 8 mm / 10 mm	Ring-mounted	703020 0008	8,85	703025 0008	6,85
2936	2 mm / 2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm / 8 mm / 10 mm	Plastic box	703020 1008	9,70	703025 1008	8,45
2936 - long	2 mm / 2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm / 8 mm / 10 mm	Plastic box	703020 2008	18,05	703025 2008	14,15
2936	2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm / 8 mm / 10 mm / 12 mm / 14 mm	Workshop stands	703020 0009	29,30	703025 0009	25,30
2936 - long	2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm / 8 mm / 10 mm / 12 mm / 14 mm	Workshop stands	703020 1009	39,20	703025 1009	29,30
2936	1.5 mm / 2 mm / 2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm	Hand-held fold-out holder, metal	703020 2007	7,05		
2936	2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm / 8 mm	Hand-held fold-out holder, metal	703020 2009	11,05	703025 2009	12,45
2936	2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm / 8 mm / 10 mm	Hand-held fold-out holder, metal	703020 2017	11,40		
2936	1.5 mm / 2 mm / 2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm	Hand-held fold-out holder, plastic	703020 3007	11,55		
2936	2.5 mm / 3 mm / 4 mm / 5 mm / 6 mm / 8 mm / 10 mm	Hand-held fold-out holder, plastic	703020 3017	16,20		
			7111		7111	

## ATORN® Hexagonal offset ball-head screwdriver

- with ball head
- for hexagonal socket head screws
- Chamfered key ends, can be used for screwing at angles up to 30°
- **Material:** high-quality chrome vanadium steel (59CrMoV4), steel grey or nickel-plated
- **Version: colour-coded:** The colour coding system assigns a colour to each wrench width so the right tool can be grabbed quickly.



### Short

Wr. width	Limb length	Steel grey		Nickel-plated	
		art.no.	€	art.no.	€
2.0 mm	52 x 18 mm	<b>703030</b> 0020	1,11	<b>703031</b> 0020	1,13
2.5 mm	58.5 x 20.5 mm	703030 0025	1,19	703031 0025	1,25
3.0 mm	66 x 23 mm	703030 0030	1,26	703031 0030	1,30
4.0 mm	74 x 29 mm	703030 0040	1,69	703031 0040	1,73
5.0 mm	85 x 33 mm	703030 0050	1,87	703031 0050	1,92
6.0 mm	96 x 38 mm	703030 0060	2,42	703031 0060	2,53
7.0 mm	102 x 41 mm	703030 0070	3,73	703031 0070	3,85
8.0 mm	108 x 44 mm	703030 0080	4,12	703031 0080	4,34
10.0 mm	122 x 50 mm	703030 0100	5,60	703031 0100	6,10
		7111		7111	



### Extra-long

Wr. width	Limb length	Steel grey		Nickel-plated		colour-coded	
		art.no.	€	art.no.	€	art.no.	€
1.5 mm	91.5 x 15.5 mm	<b>703033</b> 0015	0,81	<b>703034</b> 0015	0,91	<b>703012</b> 0015	2,45
2.0 mm	102 x 18 mm	703033 0020	0,81	703034 0020	0,91	703012 0020	2,24
2.5 mm	114.5 x 20.5 mm	703033 0025	0,81	703034 0025	1,01	703012 0025	2,24
3.0 mm	129 x 23 mm	703033 0030	0,89	703034 0030	1,14	703012 0030	2,14
4.0 mm	144 x 29 mm	703033 0040	1,09	703034 0040	1,48	703012 0040	2,45
5.0 mm	165 x 33 mm	703033 0050	1,36	703034 0050	1,68	703012 0050	2,90
6.0 mm	186 x 38 mm	703033 0060	1,71	703034 0060	2,09	703012 0060	3,82
7.0 mm	197 x 41 mm	703033 0070	5,30	703034 0070	4,67		
8.0 mm	208 x 44 mm	703033 0080	3,22	703034 0080	3,16	703012 0080	4,94
10.0 mm	234 x 50 mm	703033 0100	5,15	703034 0100	4,53	703012 0100	6,55
12.0 mm	262 x 57 mm	703033 0120	8,95	703034 0120	6,25		
		7111		7111		7111	



### Angled 100°, extra long

- CV steel, chrome-plated

Wr. width	Limb length	Chrome-plated	
		art.no.	€
1.5 mm	90 x 7.5 mm	<b>703011</b> 0015	2,39
2.0 mm	100 x 8 mm	703011 0020	2,19
2.5 mm	112 x 10.5 mm	703011 0025	2,14
3.0 mm	127 x 13 mm	703011 0030	2,09
4.0 mm	144 x 15 mm	703011 0040	2,39
5.0 mm	165 x 18 mm	703011 0050	2,80
6.0 mm	185 x 22 mm	703011 0060	3,67
8.0 mm	208 x 27 mm	703011 0080	4,63
10.0 mm	232 x 32 mm	703011 0100	6,25
		7111	



### Sets

Design	Number of pieces	Wr. width	Packaging	Steel grey		Nickel-plated		colour-coded		100°, chrome-plated	
				art.no.	€	art.no.	€	art.no.	€	art.no.	€
Normal wrench size	8-pcs.	2 mm   2.5 mm   3 mm   4 mm   5 mm   6 mm   8 mm   10 mm	Plastic box	<b>703035</b> 0008	18,35	<b>703036</b> 0008	20,20				
Long	8-pcs.	2 mm   2.5 mm   3 mm   4 mm   5 mm   6 mm   8 mm   10 mm	Plastic box	703035 1008	23,20	703036 1008	25,80				
Long	9-pcs.	1.5 mm   2 mm   2.5 mm   3 mm   4 mm   5 mm   6 mm   8 mm   10 mm	Plastic clip	703035 3009	16,60	703036 3009	18,45	<b>703044</b> 0009	24,60		
Long, angled 100 degrees	9-pcs.	1.5 mm   2 mm   2.5 mm   3 mm   4 mm   5 mm   6 mm   8 mm   10 mm	Plastic clip							<b>703011</b> 0009	23,70
				7111		7111		7111		7111	

## ATORN® Hexagonal offset pilot-tip screwdriver (pin wrench)

**DIN  
6911**

- **With pilot tip**
- For hexagonal socket head screws, DIN 6912
- Chamfered key ends
- **Material:** high-quality chrome vanadium steel (59CrMoV4), nickel-plated

### Individual

Wr. width mm	Limb length	Nickel-plated art.no.	€
3 mm	66 x 23 mm	<b>703037</b> 0003	<b>0,49</b>
4 mm	74 x 29 mm	703037 0004	<b>0,57</b>
5 mm	85 x 33 mm	703037 0005	<b>0,74</b>
6 mm	96 x 38 mm	703037 0006	<b>1,-</b>
8 mm	108 x 44 mm	703037 0008	<b>1,47</b>

7111

Wr. width mm	Limb length	Nickel-plated art.no.	€
10 mm	122 x 50 mm	703037 0010	<b>2,42</b>
12 mm	137 x 57 mm	703037 0012	<b>3,66</b>
14 mm	154 x 70 mm	703037 0014	<b>5,45</b>
17 mm	177 x 80 mm	703037 0017	<b>8,75</b>

7111



### Set

Design	Wr. width mm	Nickel-plated art.no.	€
5-pcs. in a plastic pouch	3 mm / 4 mm / 5 mm / 6 mm / 8 mm	<b>703039</b> 1005	<b>7,65</b>

7111



## ATORN® TORX® offset screwdrivers

- Strength as stipulated by the license issuer: RUIA global fasteners
- **Material:** high-quality chrome vanadium steel (59CrMoV4), steel grey

### Individual

TORX	Limb length	Steel grey art.no.	€
T6	44 x 18 mm	<b>703038</b> 0060	<b>2,09</b>
T7	50 x 18 mm	703038 0070	<b>2,09</b>
T8	51 x 19 mm	703038 0080	<b>2,09</b>
T9	51 x 19 mm	703038 0090	<b>2,09</b>
T10	54 x 20 mm	703038 0100	<b>2,24</b>
T15	57 x 22 mm	703038 0150	<b>2,29</b>
T20	61 x 23 mm	703038 0200	<b>2,29</b>
T25	65 x 25 mm	703038 0250	<b>2,29</b>

7111

TORX	Limb length	Steel grey art.no.	€
T27	70 x 27 mm	703038 0270	<b>2,29</b>
T30	76 x 30 mm	703038 0300	<b>2,55</b>
T40	83 x 33 mm	703038 0400	<b>2,75</b>
T45	91 x 37 mm	703038 0450	<b>3,01</b>
T50	104 x 41 mm	703038 0500	<b>3,36</b>
T55	120 x 47 mm	703038 0550	<b>4,58</b>
T60	134 x 52 mm	703038 0600	<b>6,70</b>

7111



### Extra-long

NEW

TORX	Limb length	Steel grey art.no.	€
T5	72 x 13 mm	<b>703013</b> 0005	<b>2,60</b>
T6	80 x 15 mm	703013 0006	<b>2,85</b>
T7	88 x 18 mm	703013 0007	<b>2,85</b>
T8	101 x 20 mm	703013 0008	<b>2,85</b>
T9	111 x 21 mm	703013 0009	<b>2,85</b>
T10	121 x 23 mm	703013 0010	<b>3,11</b>
T15	136 x 27 mm	703013 0015	<b>3,21</b>

7111

TORX	Limb length	Steel grey art.no.	€
T20	148 x 29 mm	703013 0020	<b>3,31</b>
T25	163 x 33 mm	703013 0025	<b>3,51</b>
T27	170 x 36 mm	703013 0027	<b>3,92</b>
T30	178 x 38 mm	703013 0030	<b>4,23</b>
T40	188 x 43 mm	703013 0040	<b>5,60</b>
T50	200 x 50 mm	703013 0050	<b>7,75</b>

7111

### Sets

Design	TORX	Steel grey art.no.	€
8-pcs. on ring in hang-up bag	T9 / T10 / T15 / T20 / T25 / T27 / T30 / T40	<b>703045</b> 0008	<b>31,50</b>
8-pcs. plastic box	T9 / T10 / T15 / T20 / T25 / T27 / T30 / T40	703045 1008	<b>18,15</b>
8-pcs. hand-held fold-out holder	T9 / T10 / T15 / T20 / T25 / T27 / T30 / T40	703045 2008	<b>19,55</b>

7111



703045 0008



703045 2008



703045 1008

## ATORN® TORX® offset ball-head screwdrivers

- With ball head
- Strength as stipulated by the license issuer: RUIA global fasteners
- **Material:** high-quality chrome vanadium steel (59CrMoV4), steel grey

**Set**

Design	TORX	Steel grey	art.no.	€
8-pcs. plastic clip	T9 / T10 / T15 / T20 / T25 / T27 / T30 / T40	<b>703047</b>	1008	<b>25,20</b>

7111



## ATORN® TORX® offset screwdriver, colour-coded

- TORX® ball head on the long end, with wear-resistant powder coating
- Chrome vanadium steel, hardened
- The colour coding system assigns a colour to each wrench width so the right tool can be grabbed quickly.

**Extra-long**

TORX	Limb length	colour-coded	art.no.	€
T9	59 x 9 mm	<b>703056</b>	0009	<b>3,87</b>
T10	65 x 20 mm	703056	0010	<b>3,92</b>
T15	75.5 x 20 mm	703056	0015	<b>4,02</b>
T20	84 x 21 mm	703056	0020	<b>4,07</b>
T25	100.5 x 22.5 mm	703056	0025	<b>4,38</b>
T27	111.5 x 25.5 mm	703056	0027	<b>4,58</b>
T30	125 x 30 mm	703056	0030	<b>4,68</b>
T40	139 x 33 mm	703056	0040	<b>5,10</b>

7111

**Set**

- In practical plastic holder, key easy to remove

Design	TORX	colour-coded	art.no.	€
8-pcs. plastic clip	T9 / T10 / T15 / T20 / T25 / T27 / T30 / T40	<b>703056</b>	0008	<b>29,10</b>

7111



## ATORN® TORX® and TORX PLUS® flag-handle screwdrivers

- **Material:** high-quality molybdenum vanadium steel

**TORX®**

Wr. width mm	Total length mm	Blade length mm	TORX art.no.	€
T5	67	19	<b>703053</b> 0050	<b>1,93</b>
T6	67	19	703053 0060	<b>1,93</b>
T7	67	19	703053 0070	<b>1,93</b>
T8	67	19	703053 0080	<b>1,93</b>

7114

Wr. width mm	Total length mm	Blade length mm	TORX art.no.	€
T9	74	24	703053 0090	<b>1,93</b>
T10	74	24	703053 0100	<b>1,93</b>
T15	80	28	703053 0150	<b>1,93</b>
T20	80	28	703053 0200	<b>1,93</b>

7114



**TORX® Set, 7 pcs. in a small workbench stand**

Contents	art.no.	€
T6 / T7 / T8 / T9 / T10 / T15 / T20	<b>703053</b> 0001	<b>13,85</b>

7114



**TORX PLUS®**

Wr. width mm	Total length mm	Blade length mm	TORX PLUS art.no.	€
5IP	67	19	<b>703054</b> 0050	<b>2,24</b>
6IP	67	19	703054 0060	<b>2,24</b>
7IP	67	19	703054 0070	<b>2,24</b>
8IP	67	19	703054 0080	<b>2,24</b>

7114

Wr. width mm	Total length mm	Blade length mm	TORX PLUS art.no.	€
9IP	74	24	703054 0090	<b>2,24</b>
10IP	74	24	703054 0100	<b>2,24</b>
15IP	80	28	703054 0150	<b>2,24</b>
20IP	80	28	703054 0200	<b>2,24</b>

7114



**TORX PLUS® Set, 7 pcs. in a small workbench stand**

Contents	art.no.	€
6IP / 7IP / 8IP / 9IP / 10IP / 15IP / 20IP	<b>703054</b> 0001	<b>15,90</b>

7114



## ATORN® T-handle screwdrivers

### T-handle hexagonal screwdriver

- Straight, with ergonomic T-handle
- Through-hardened blade
- Front edges rounded, gloss nickel-plated
- **Material:** high-quality chrome vanadium steel

Wr. width	Blade length mm	art.no.	€
2 mm	100	<b>703060 0020</b>	<b>2,70</b>
2.5 mm	100	703060 0025	2,70
3 mm	100	703060 0030	2,50
3 mm	150	703060 0130	2,70
3 mm	200	703060 0230	3,01
4 mm	100	703060 0040	2,60
4 mm	150	703060 0140	2,80
4 mm	200	703060 0240	3,06
5 mm	100	703060 0050	2,90
5 mm	150	703060 0150	3,06

7111

Wr. width	Blade length mm	art.no.	€
5 mm	200	703060 0250	3,67
6 mm	100	703060 0060	3,41
6 mm	150	703060 0160	3,51
6 mm	200	703060 0260	3,82
8 mm	100	703060 0080	3,92
8 mm	150	703060 0180	4,23
8 mm	200	703060 0280	4,43
10 mm	100	703060 0100	6,65
10 mm	200	703060 2100	8,35

7111



### TORX® T-handle screwdrivers

- Handle made from shock-proof ABS terpolymer
- Chrome-plated blade with black tip
- Strength as stipulated by the license issuer: RUIA global fasteners
- **Material:** high-quality chrome vanadium steel (59CrMoV4)

TORX	Total length mm	Blade length mm	TORX art.no.	€
T8	125	100	<b>703040 0080</b>	<b>4,63</b>
T9	125	100	703040 0090	4,84
T10	125	100	703040 0100	4,84
T15	125	100	703040 0150	4,84
T15	225	200	703040 1150	6,80
T20	132	100	703040 0200	6,10
T20	232	200	703040 1200	7,50
T25	132	100	703040 0250	6,10
T25	232	200	703040 1250	7,95
T27	132	100	703040 0270	6,10

7111

TORX	Total length mm	Blade length mm	TORX art.no.	€
T27	232	200	703040 1270	8,75
T30	132	100	703040 0300	6,30
T30	232	200	703040 1300	9,25
T40	132	100	703040 0400	6,30
T40	232	200	703040 1400	10,05
T45	189	150	703040 0450	9,40
T45	289	250	703040 1450	13,-
T50	189	150	703040 0500	11,10
T50	289	250	703040 1500	15,20

7111



### 7 pcs. set

Contents		art.no.	€
2 x 100 mm - 2.5 x 100 mm - 3 x 100 mm - 4 x 150 mm - 5 x 150 mm - 6 x 200 mm - 8 x 200 mm		<b>703061 0007</b>	<b>21,70</b>

7111



# EVERYTHING FOR SCREWDRIVERS

**wiha**  
Tools that work for you



**WIHA**  
Hand tools  
361 pages  
Art.no. 019900 5548

Overview of all free manufacturers' catalogues  
on page 16/17

## ATORN® Screwdrivers

**DIN 5265 D**

**DIN 5262 D**

- With 2-component heavy-duty handle, steel blue and black, with extra-large soft zone
- Blade made from through-hardened chrome vanadium molybdenum steel, matt chrome-plated finish
- With black tip

### Slot

- DIN 5265 D
- Hexagonal bolster for models over 5.5 mm

Cutting edge width mm	Blade length mm	art.no.	€
3.5	75	<b>705138 0035</b>	<b>4,03</b>
4.5	90	705138 0045	4,51
5.5	100	705138 0055	5,20
6.5	125	705138 0065	6,20
8.0	150	705138 0080	9,60
10.0	175	705138 0100	11,60
12.0	200	705138 0120	12,85

7114

### PH Phillips recess

- DIN 5262 D

PH	Blade length mm	art.no.	€
PH1	80	<b>705139 0001</b>	<b>5,05</b>
PH2	100	705139 0002	7,05
PH3	150	705139 0003	9,10

7114

### PZ Pozidriv-Supadriv

- DIN 5262 D

PZ	Blade length mm	art.no.	€
PZ1	80	<b>705140 0001</b>	<b>5,40</b>
PZ2	100	705140 0002	7,05
PZ3	150	705140 0003	9,50

7114

### Security TORX®

- Security version from T10

TORX	Blade length mm	Wrench art.no.	€
T6	60	<b>705141 0006</b>	<b>4,82</b>
T7	60	705141 0007	5,05
T8	60	705141 0008	5,40
T9	60	705141 0009	5,65
TR10	80	705141 0010	5,75
TR15	80	705141 0015	6,35
TR20	100	705141 0020	7,05
TR25	100	705141 0025	7,65
TR27	115	705141 0027	8,10
TR30	115	705141 0030	12,20
TR40	130	705141 0040	14,75

7114

### Sets

Contents	Slot mm	PH	PZ	TORX	Six-edged mm	art.no.	€
6-pcs.	3.5 / 4.5 / 5.5 / 6.5 / 8.0 / 10.0	-	-	-	-	<b>705143 0001</b>	<b>38,60</b>
3-pcs.	-	PH1 / PH2 / PH3	-	-	-	705143 0002	20,90
3-pcs.	-	-	PZ1 / PZ2 / PZ3	-	-	705143 0003	21,30
6-pcs.	4.5 / 5.5 / 6.5 / 8.0	PH1 / PH2	-	-	-	705143 0004	36,60
8-pcs.	5.5 / 6.5 / 8.0	PH1 / PH2 / PH3	PZ1 / PZ2	-	-	705143 0005	49,40
3-pcs.	-	-	-	TR10 / TR15 / TR20	-	705143 0006	18,85
5-pcs.	-	-	-	T6 / T7 / T8 / T9 / TR10	-	705143 0007	27,40
5-pcs.	-	-	-	TR10 / TR15 / TR20 / TR25 / TR30	-	705143 0008	34,60
7-pcs.	-	-	-	T8 / T9 / TR10 / TR15 / TR20 / TR25 / TR30	-	705143 0009	45,30

7114



705143 0005



## ATORN® VDE screwdriver

DIN  
7437DIN  
7438

- With 2-component heavy-duty handle, red and yellow
- Blade made from hardened and burnished chrome vanadium molybdenum steel
- Protective insulation sprayed directly onto the blade

### Slot

- DIN 7437

Cutting edge width mm	Blade length mm	art.no.	€
2.5	75	<b>705170 0025</b>	<b>3,56</b>
3	100	705170 0030	<b>3,67</b>
3.5	100	705170 0035	<b>3,82</b>
4	100	705170 0040	<b>5,05</b>
5.5	125	705170 0055	<b>6,65</b>
6.5	150	705170 0065	<b>6,85</b>
8	175	705170 0080	<b>8,85</b>
10	200	705170 0100	<b>10,80</b>

7114



### PH Phillips

- DIN 7438

PH	Blade length mm	art.no.	€
0	60	<b>705171 0000</b>	<b>4,53</b>
1	80	705171 0001	<b>5,80</b>
2	100	705171 0002	<b>6,65</b>
3	150	705171 0003	<b>8,85</b>

7114



### PZ Pozidriv-Supadriv

- DIN 7438

PZ	Blade length mm	art.no.	€
0	60	<b>705172 0000</b>	<b>5,05</b>
1	80	705172 0001	<b>6,25</b>
2	100	705172 0002	<b>7,25</b>
3	150	705172 0003	<b>9,70</b>

7114



### Set

Contents	Slot mm	PH	PZ	art.no.	€
3-pcs.	-	PH1 - PH2 - PH3	-	<b>705173 0001</b>	<b>16,60</b>
3-pcs.	-	-	PZ1 - PZ2 - PZ3	705173 0002	<b>21,90</b>
5-pcs.	2.5 - 4.0 - 5.5 - 6.5 - 8.0	-	-	705173 0003	<b>26,30</b>
6-pcs.	2.5 - 3.5 - 4.0 - 5.5	PH1 - PH2	-	705173 0004	<b>27,40</b>
7-pcs. incl. voltage tester	2.5 - 4.0 - 5.5 - 6.5	PH1 - PH2	-	705173 0005	<b>32,70</b>

7114

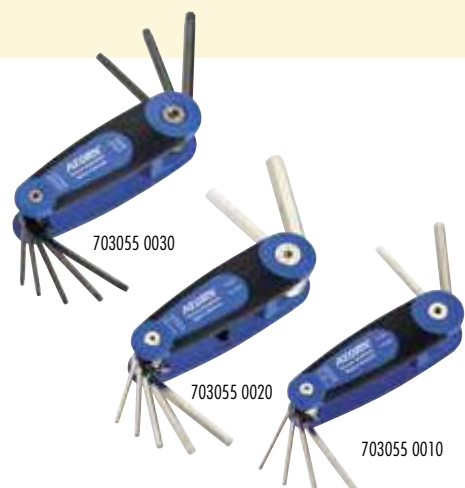


## ATORN® Screwdrivers in a hand-held fold-out holder

- 2-component hand-held fold-out holder with lifting device
- Keys made from hardened chrome vanadium steel

Contents	Six-edged mm	TORX	art.no.	€
7-pcs., nickel-plated	1.5 - 2 - 2.5 - 3 - 4 - 5 - 6	-	<b>703055 0010</b>	<b>14,15</b>
7-pcs., nickel-plated	2.5 - 3 - 4 - 5 - 6 - 8 - 10	-	703055 0020	<b>14,65</b>
8-pcs., steel grey	-	T9 - T10 - T15 - T20 - T25 - T27 - T30 - T40	703055 0030	<b>21,10</b>

7111



## ATORN® Screwdriver inserts / bits C 6.3

- Form C 6.3 hexagonal connector, 6.35 mm (1/4")
- Tough design
- Unit prices when purchased in PU

### Slot

Slot mm	Total length mm	☒	art.no.	€
0.6 x 4.5	25	10	<b>702401</b> 0006	0,65
0.8 x 5.5	25	10	702401 0008	0,65
1.0 x 5.5	25	10	702401 0010	0,65
1.2 x 6.5	25	10	702401 0012	0,65
1.6 x 8.0	25	10	702401 0016	0,65

7105



### Cross head (PHILLIPS), short

PH	Total length mm	☒	Standard bit		☒	Torsion bit	
			art.no.	€		art.no.	€
PH 0	25	10	<b>702402</b> 0000	0,41	10	<b>702415</b> 0001	0,86
PH 1	25	10	702402 0001	0,41	10	702415 0002	0,86
PH 2	25	10	702402 0002	0,41	10	702415 0003	0,86
PH 3	25	10	702402 0003	0,41	10		

7105

7105



### POZIDRIV, short

PZ	Total length mm	☒	Standard bit		☒	Torsion bit	
			art.no.	€		art.no.	€
PZ 0	25	10	<b>702403</b> 0000	0,41			
PZ 1	25	10	702403 0001	0,41	10	<b>702416</b> 0001	0,86
PZ 2	25	10	702403 0002	0,41	10	702416 0002	0,86
PZ 3	25	10	702403 0003	0,41	10	702416 0003	0,86

7105

7105



### TORX®

TORX	Total length mm	☒	Standard bit		☒	Torsion bit	
			art.no.	€		art.no.	€
TX 3	25	10	<b>702404</b> 0003	1,65			
TX 4	25	10	702404 0004	1,65			
TX 5	25	10	702404 0005	0,90			
TX 6	25	10	702404 0006	0,90			
TX 7	25	10	702404 0007	0,90			
TX 8	25	10	702404 0008	0,90			
TX 9	25	10	702404 0009	0,90			
TX 10	25	10	702404 0010	0,86	10	<b>702417</b> 0010	1,07
TX 15	25	10	702404 0015	0,86	10	702417 0015	1,07
TX 20	25	10	702404 0020	0,86	10	702417 0020	1,07
TX 25	25	10	702404 0025	0,86	10	702417 0025	1,07
TX 27	25	10	702404 0027	0,86	10	702417 0027	1,07
TX 30	25	10	702404 0030	0,86	10	702417 0030	1,07
TX 40	25	10	702404 0040	0,86	10	702417 0040	1,07

7105

7105



### TORX® with bore

TORX	Total length mm	☒	art.no.	€
TX 10	25	10	<b>702405</b> 0010	2,29
TX 15	25	10	702405 0015	2,29
TX 20	25	10	702405 0020	2,29
TX 25	25	10	702405 0025	2,29
TX 27	25	10	702405 0027	2,29
TX 30	25	10	702405 0030	2,29
TX 40	25	10	702405 0040	2,29

7105



**TORX PLUS®**



TORX plus	Total length mm	art.no.	€
6 IP	25	10 702406 0006	2,55
7 IP	25	10 702406 0007	2,55
8 IP	25	10 702406 0008	2,55
9 IP	25	10 702406 0009	2,55
10 IP	25	10 702406 0010	2,55
15 IP	25	10 702406 0015	2,55
20 IP	25	10 702406 0020	2,55
25 IP	25	10 702406 0025	2,55
27 IP	25	10 702406 0027	2,55
30 IP	25	10 702406 0030	2,55
40 IP	25	10 702406 0040	2,55

7105



**Hex**



Interior hexagon mm	Total length mm	art.no.	€
1.5	25	10 702407 0015	1,50
2.0	25	10 702407 0020	1,50
2.5	25	10 702407 0025	1,50
3.0	25	10 702407 0030	1,50
4.0	25	10 702407 0040	1,50
5.0	25	10 702407 0050	1,50
6.0	25	10 702407 0060	1,50
7.0	25	10 702407 0070	1,50
8.0	25	10 702407 0080	1,50
10.0	25	10 702407 0100	1,50

7105



Non-rebound ...

... it's the tool.

**ATORN®**  
Performance demands quality

**POWER TOOLS FOR PROFESSIONALS**



**MILWAUKEE**  
Power tools  
127 pages  
Art.no. 019900 5477

Overview of all free manufacturers' catalogues on page 16/17





## ATORN® Bit boxes

### Bit box with premium bit holder and handle

Contents	Interior hexagon mm	Slot mm	PH	PZ	TORX	art.no.	€
32-pcs. 1 x handle with holding fixture 1/4 inch 1 x premium bit holder CentroFix	1x4.0 1x5.0 1x6.0	1x4.5 1x5.5 1x6.5	1x PH1 5x PH3	2x PZ1 5x PZ2 2x PZ3	1xT10 1xT15 1xT20 1xT25 1xT30 1xT40	702565 0032	44,30
32-pcs. 1 x handle with holding fixture 1/4 inch 1 x premium bit holder CentroFix	-	-	2xPH1 5xPH2 2xPH3	2xPZ1 5xPZ2 2xPZ3	2xT10 2xT15 2xT20 2xT25 2xT30 2xT40	702565 1032	44,70

7114



### Bit box with premium bit holder

Contents	Interior hexagon mm	Slot mm	PH	PZ	TORX	art.no.	€
61-pcs. 1 x premium bit holder CentroFix	2x3.0 2x4.0 2x5.0 2x6.0	1x4.5 1x5.5 1x6.5 1x8.0	4xPH1 10xPH2 4xPH3	4xPZ1 10xPZ2 4xPZ3	2xT10 2xT15 2xT20 2xT25 2xT30 2xT40	702566 0061	63,10

7114



### Bit box with bit holder

Contents	Interior hexagon mm	Slot mm	PH	PZ	TORX	art.no.	€
17-pcs. 1 x bit holder	1x3.0 1x4.0 1x5.0	1x4.5 1x6.5	1xPH1 1xPH2 1xPH3	1xPZ1 1xPZ2 1xPZ3	1xT10 1xT15 1xT20 1xT25 1xT30	702567 0017	18,85
17-pcs. 1 x bit holder			1xPH1 2xPH2 1xPH3	1xPZ1 2xPZ2 1xPZ3	1xT10 1xT15 2xT20 2xT25 1xT30 1xT40	702567 1017	17,60

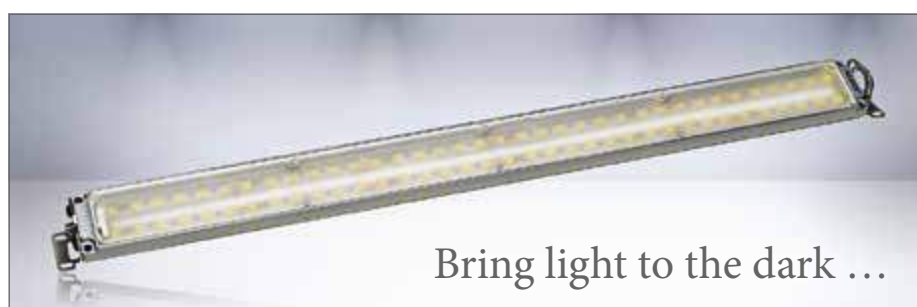
7114



### Bit holder

Description	art.no.	€
Bit holder CentroFix 1/4 inch x 60 mm for drive C and E 6.3	702568 0001	17,50
Quick release holder 1/4 inch x 60 mm for drive C 6.3	702568 0002	4,94
Bit holder screwdriver 1/4 inch x 125 mm, magnetic for drive C 6.3	702568 0003	13,20
Bit holder screwdriver 1/4 inch mount for interchangeable holder	702568 0004	9,70

7114



Bring light to the dark ...

... with LED.

**ATORN®**  
Performance demands quality

## ATORN® Sockets

### 1/4"

- Chrome vanadium steel, chrome-plated, with a pin hole
- Hexagonal version with special profile for higher torques
- Optimum force transmission and screw protection



Hexagonal socket, 1/4 inch, DIN 3124

Wr. width	L mm	art.no.	€
4 mm	25	<b>702108 0040</b>	<b>3,67</b>
4.5 mm	25	702108 0045	<b>3,67</b>
5 mm	25	702108 0050	<b>3,82</b>
5.5 mm	25	702108 0055	<b>3,82</b>
6 mm	25	702108 0060	<b>3,82</b>
7 mm	25	702108 0070	<b>3,82</b>
8 mm	25	702108 0080	<b>3,82</b>
9 mm	25	702108 0090	<b>3,97</b>
10 mm	25	702108 0100	<b>3,97</b>
11 mm	25	702108 0110	<b>3,97</b>
12 mm	25	702108 0120	<b>4,23</b>
13 mm	25	702108 0130	<b>4,23</b>
14 mm	25	702108 0140	<b>4,48</b>

7101



Hexagonal socket, 1/4 inch, long

Wr. width	L mm	art.no.	€
4 mm	50	<b>702109 0040</b>	<b>10,-</b>
4.5 mm	50	702109 0045	<b>10,20</b>
5 mm	50	702109 0050	<b>10,20</b>
5.5 mm	50	702109 0055	<b>10,20</b>
6 mm	50	702109 0060	<b>10,20</b>
7 mm	50	702109 0070	<b>10,20</b>
8 mm	50	702109 0080	<b>10,20</b>
9 mm	50	702109 0090	<b>10,60</b>
10 mm	50	702109 0100	<b>10,20</b>
11 mm	50	702109 0110	<b>10,60</b>
12 mm	50	702109 0120	<b>10,60</b>
13 mm	50	702109 0130	<b>11,20</b>
14 mm	50	702109 0140	<b>12,05</b>

7101



Hex bit, 1/4 inch

Wr. width	L mm	art.no.	€
3 mm	28	<b>702110 0030</b>	<b>6,35</b>
4 mm	28	702110 0040	<b>6,35</b>
5 mm	28	702110 0050	<b>6,35</b>
6 mm	28	702110 0060	<b>6,35</b>
8 mm	28	702110 0080	<b>7,15</b>

7101

TORX bit, 1/4 inch

TORX	L mm	art.no.	€
T8	37	<b>702111 0080</b>	<b>7,15</b>
T9	37	702111 0090	<b>7,15</b>
T10	37	702111 0100	<b>7,15</b>
T15	37	702111 0150	<b>7,15</b>
T20	37	702111 0200	<b>7,15</b>
T25	37	702111 0250	<b>7,15</b>
T27	37	702111 0270	<b>7,15</b>
T30	37	702111 0300	<b>7,15</b>
T40	37	702111 0400	<b>8,55</b>

7101

TORX socket, 1/4 inch

TORX	L mm	art.no.	€
E 4	25	<b>702112 0040</b>	<b>6,15</b>
E 5	25	702112 0050	<b>6,15</b>
E 6	25	702112 0060	<b>6,15</b>
E 7	25	702112 0070	<b>6,15</b>
E 8	25	702112 0080	<b>6,15</b>
E 10	25	702112 0100	<b>6,35</b>

7101

Flat head, 1/4 inch

Slot mm	L mm	art.no.	€
0.8 x 4.0	37	<b>702113 0040</b>	<b>6,15</b>
1.0 x 5.5	37	702113 0055	<b>6,15</b>
1.2 x 6.5	37	702113 0065	<b>6,15</b>

7101

Cross head (Phillips), 1/4 inch

PH	L mm	art.no.	€
PH 1	37	<b>702114 0010</b>	<b>6,15</b>
PH 2	37	702114 0020	<b>6,15</b>
PH 3	37	702114 0030	<b>6,15</b>

7101

Pozidriv, 1/4 inch

PZ	L mm	art.no.	€
PZ 1	37	<b>702115 0010</b>	<b>7,35</b>
PZ 2	37	702115 0020	<b>7,35</b>
PZ 3	37	702115 0030	<b>7,35</b>

7101

## ATORN® Drives and connectors

### 1/4"

Designation	L mm	art.no.	€
Lever-reversible ratchet	150	<b>702010 0014</b>	<b>42,80</b>
Handle with slide block	115	702010 0006	<b>8,95</b>
Adapter 1/4 inch internal x 3/8 inch external	26	702010 0007	<b>7,95</b>
Cardan joint	40	702010 0004	<b>19,15</b>
Extension	50	702010 0002	<b>6,35</b>
Extension	105	702010 0003	<b>6,35</b>
Extension	150	702010 0035	<b>7,15</b>

7101



702010 0014



702010 0007



702010 0002

702010 0006



702010 0004



## ATORN® Sockets

### 3/8"

- Chrome vanadium steel, chrome-plated, with a pin hole
- Hexagonal version with special profile for higher torques
- Optimum force transmission and screw protection



### Hexagonal socket, 3/8 inch

Wr. width	L mm	art.no.	€
6 mm	24	<b>702128 0006</b>	<b>5,90</b>
7 mm	24	702128 0007	5,90
8 mm	24	702128 0008	5,90
9 mm	24	702128 0009	5,90
10 mm	25	702128 0010	5,50
11 mm	26	702128 0011	5,90
12 mm	27	702128 0012	5,90
13 mm	28	702128 0013	5,50
14 mm	28	702128 0014	6,15
15 mm	30	702128 0015	6,15
16 mm	30	702128 0016	6,15
17 mm	30	702128 0017	6,15
18 mm	30	702128 0018	6,15
19 mm	30	702128 0019	6,15
20 mm	32	702128 0020	6,75
21 mm	32	702128 0021	6,75
22 mm	34	702128 0022	6,75

7101



### Hex bit, 3/8 inch

Wr. width	L mm	art.no.	€
3 mm	47	<b>702130 0030</b>	<b>6,55</b>
4 mm	47	702130 0040	6,55
5 mm	47	702130 0050	6,55
6 mm	47	702130 0060	6,55
7 mm	47	702130 0070	6,55
8 mm	49	702130 0080	6,55
9 mm	50	702130 0090	6,55
10 mm	50	702130 0100	6,55
12 mm	50	702130 0120	12,65

7101



### TORX bit, 3/8 inch

TORX	L mm	art.no.	€
T20	43.5	<b>702131 0200</b>	<b>8,95</b>
T25	43.5	702131 0250	8,95
T27	43.5	702131 0270	8,95
T30	43.5	702131 0300	8,95
T40	43.5	702131 0400	8,95
T45	43.5	702131 0450	8,95
T50	44.5	702131 0500	8,95

7101



### TORX socket, 3/8 inch

TORX	L mm	art.no.	€
EX 5	27	<b>702132 0050</b>	<b>8,75</b>
EX 6	27	702132 0060	8,75
EX 7	27	702132 0070	8,75
EX 8	27	702132 0080	8,75
EX10	27	702132 0100	8,75
EX11	27	702132 0110	8,75
EX12	27	702132 0120	8,75
EX14	27	702132 0140	8,75

7101



### Flat head, 3/8 inch

Slot mm	L mm	art.no.	€
1.0 x 5.5	49	<b>702133 0055</b>	<b>8,85</b>
1.2 x 8.0	49	702133 0080	8,85
1.6 x 10.0	49	702133 0100	10,50

7101



### Cross head (Phillips), 3/8 inch

PH	L mm	art.no.	€
PH 1	49	<b>702134 0010</b>	<b>8,85</b>
PH 2	49	702134 0020	8,85
PH 3	49	702134 0030	8,85

7101

## ATORN® Drives and connectors

### 3/8"

Designation	L mm	art.no.	€
Lever-reversible ratchet	190	<b>702030 0038</b>	<b>56,-</b>
Handle with slide block	163	702030 0010	11,60
Adapter 3/8 inch internal x 1/4 inch external	29	702030 0007	8,35
Adapter 3/8 inch internal x 1/2 inch external	36	702030 0008	8,35
Cardan joint	46	702030 0006	22,80
Extension	50	702030 0009	9,60
Extension	75	702030 0002	8,35
Extension	125	702030 0003	9,60
Extension	150	702030 0004	11,60
Extension	250	702030 0005	13,25

7101



702030 0038



702030 0010



702030 0002

702030 0007



702030 0006

## ATORN® Sockets

### 1/2"

- Chrome vanadium steel, chrome-plated, with a pin hole
- Hexagonal version with special profile for higher torques
- Optimum force transmission and screw protection



#### Hexagonal socket, 1/2 inch, DIN 3124

Wr. width	L mm	art.no.	€
8 mm	38	702148 0008	6,35
9 mm	38	702148 0009	6,35
10 mm	38	702148 0010	5,30
11 mm	38	702148 0011	5,70
12 mm	38	702148 0012	5,70
13 mm	38	702148 0013	5,30
14 mm	38	702148 0014	5,90
15 mm	38	702148 0015	5,90
16 mm	38	702148 0016	5,90
17 mm	38	702148 0017	6,35
18 mm	38	702148 0018	6,75
19 mm	38	702148 0019	6,35
20 mm	38	702148 0020	7,15
21 mm	38	702148 0021	8,35
22 mm	42	702148 0022	7,15
23 mm	42	702148 0023	8,35
24 mm	42	702148 0024	8,35
26 mm	42	702148 0026	8,75
27 mm	45	702148 0027	9,80
28 mm	45	702148 0028	10,80
30 mm	45	702148 0030	10,80
32 mm	47	702148 0032	10,80

7101



#### 12-point socket, 1/2 inch, long

Wr. width	L mm	art.no.	€
10 mm	77	702149 0010	13,85
11 mm	77	702149 0011	13,85
12 mm	77	702149 0012	13,85
13 mm	77	702149 0013	13,85
14 mm	77	702149 0014	14,45
15 mm	77	702149 0015	15,90
16 mm	77	702149 0016	15,90
17 mm	77	702149 0017	15,90
18 mm	82	702149 0018	16,30
19 mm	82	702149 0019	15,90
20 mm	82	702149 0020	16,30
21 mm	82	702149 0021	16,30
22 mm	82	702149 0022	17,10
23 mm	75	702149 0023	17,80
24 mm	82	702149 0024	17,10
26 mm	82	702149 0026	17,10
27 mm	82	702149 0027	19,15
30 mm	82	702149 0030	19,35
32 mm	82	702149 0032	20,60

7101



#### Hex bit, 1/2 inch

Wr. width	L mm	art.no.	€
4 mm	55	702150 0040	6,75
5 mm	55	702150 0050	6,75
6 mm	55	702150 0060	6,75
7 mm	55	702150 0070	6,75
8 mm	55	702150 0080	6,75
10 mm	55	702150 0100	7,75
12 mm	55	702150 0120	7,75
14 mm	55	702150 0140	9,80
17 mm	55	702150 0170	10,60
19 mm	55	702150 0190	11,40

7101



#### TORX bit, 1/2 inch

TORX	L mm	art.no.	€
T20	55	702151 0200	10,20
T25	55	702151 0250	10,20
T27	55	702151 0270	10,20
T30	55	702151 0300	10,20
T40	55	702151 0400	11,40
T45	55	702151 0450	11,40
T50	55	702151 0500	11,40
T55	55	702151 0550	14,65
T60	55	702151 0600	14,65

7101



#### TORX bit, 1/2 inch, long

TORX	L mm	art.no.	€
T20	110	702156 0200	11,80
T25	110	702156 0250	11,80
T27	110	702156 0270	11,80
T30	110	702156 0300	11,80
T40	110	702156 0400	13,65
T45	110	702156 0450	13,65
T50	110	702156 0500	13,65
T55	110	702156 0550	16,90
T60	110	702156 0600	16,90

7101



#### TORX socket, 1/2 inch

TORX	art.no.	€
EX 10	702152 0100	8,95
EX 11	702152 0110	8,95
EX 12	702152 0120	8,95
EX 14	702152 0140	9,80
EX 16	702152 0160	9,80
EX 18	702152 0180	10,60
EX 20	702152 0200	10,60
EX 22	702152 0220	11,-
EX 24	702152 0240	14,25

7101



#### Flat head, 1/2 inch

Slot mm	L mm	art.no.	€
1.2 x 8.0	60	702153 0080	11,60
1.6 x 10.0	60	702153 0100	11,60
2.0 x 12.0	60	702153 0120	11,60
2.5 x 14.0	60	702153 0140	12,85

7101



#### Cross head (PH Phillips), 1/2 inch

PH	L mm	art.no.	€
PH 2	60	702154 0020	10,80
PH 3	60	702154 0030	11,-
PH 4	60	702154 0040	11,60

7101



#### Cross head (PZ Pozidriv), 1/2 inch

PZ	L mm	art.no.	€
PZ 2	60	702155 0020	10,80
PZ 3	60	702155 0030	11,-
PZ 4	60	702155 0040	11,60

7101

**ATORN® Drives and connectors**

1/2"



702060 0013

Designation	L mm	art.no.	€
Lever-reversible ratchet	255	<b>702060 0013</b>	<b>60,10</b>
Handle with slide block	300	702060 0008	12,65
Adapter 1/2 inch internal x 3/8 inch external	38	702060 0009	8,35
Adapter 1/2 inch internal x 3/4 inch external	49	702060 0010	10,60
Cardan joint	75	702060 0005	22,60
Spark plug insert	16	702060 0011	9,10
Spark plug insert	21	702060 0012	10,80
Extension	75	702060 0002	8,95
Extension	125	702060 0025	9,40
Extension	250	702060 0035	12,45



702060 0008



702060 0005



702060 0009



702060 0002



702060 0011

7101

**ATORN® Socket sets**

1/4"



- Sheet steel box, powder-coated
- With two-colour foam inlay and removable trays
- Hexagonal with special profile for higher torques
- Optimum force transmission and screw protection



702205 1428



702205 1418



702205 1442

Contents	Six-edged mm	Interior hexagon mm	Slot mm	PH	PZ	TORX	Dimensions W x D x H mm	Weight g	art.no.	€
18-pcs. 1 reversible ratchet 150 mm 1 Cardan joint 40 mm 2 extensions 50/105 mm 1 handle with slide block	4 / 4.5 / 5 / 5.5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14	-	-	-	-	-	225x130x37	approx. 1030	<b>702205 1418</b>	<b>132,50</b>
28-pcs. 1 reversible ratchet 150 mm 1 Cardan joint 40 mm 1 extension 50 mm 1 handle with slide block	4 / 4.5 / 5 / 5.5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13	3 4 5 6 8	4 5.5 6.5	PH1 PH2	PZ1 PZ2	-	225x130x37	approx. 1140	702205 1428	152,-
42-pcs. 1 reversible ratchet 150 mm 1 Cardan joint 40 mm 2 extensions, 50/105 mm 1 handle with slide block	4 / 4.5 / 5 / 5.5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / long: 8 / 10 / 11 / 13	3 4 5 6 8	4 5.5 6.5	PH1 PH2 PH3	PZ1 PZ2 PZ3	T10 T15 T20 T25 T30 T40	320x130x47	approx. 1760	702205 1442	206,-

7101

## ATORN® Socket set

3/8"



- Sheet steel box, powder-coated
- With two-colour foam inlay and removable trays
- Hexagonal with special profile for higher torques
- Optimum force transmission and screw protection



Contents	Six-edged mm	Dimensions W x D x H mm	Weight kg	art.no.	€
22-pcs. 1 reversible ratchet 190 mm 1 Cardan joint 55 mm 3 extensions 50/75/150 mm... 1 adapter 1/2 inch x 3/8 inch	6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16 / 17 / 18 / 19 / 20 / 21 / 22	320x130x47	2,080	<b>702209</b> 3823	<b>199,50</b>

7101

## ATORN® Socket sets

1/2"



- Sheet steel box, powder-coated
- With two-colour foam inlay and removable trays
- Hexagonal with special profile for higher torques
- Optimum force transmission and screw protection



702214 1219



702214 1222



702214 1235

Contents	Weight g	Six-edged mm	Interior hexagon mm	PH	Dimensions W x D x H mm	TORX	art.no.	€
19-pcs. 1 reversible ratchet 255 mm 1 Cardan joint 75 mm 2 extensions 125/250 mm 1 handle with slide block	approx. 4420	10 / 11 / 12 / 13 / 14 / 15 / 16 / 17 / 19 / 22 / 24 / 27 / 30 / 32	-	-	455x180x51	-	<b>702214</b> 1219	<b>218,-</b>
22-pcs. spark plug inserts 16/21 mm 1 reversible ratchet 255 mm 1 Cardan joint 75 mm 2 extensions 125/250 mm 1 adapter 1/2 inch x 3/8 inch	approx. 4352	10 / 11 / 12 / 13 / 14 / 15 / 16 / 17 / 18 / 19 / 22 / 24 / 27 / 30 / 32	-	-	455x180x51	-	702214 1222	<b>228,-</b>
35-pcs. 1 reversible ratchet 255 mm 1 Cardan joint 75 mm 2 extensions 125/250 mm 1 adapter 1/2 inch x 3/8 inch	approx. 5234	10 / 11 / 12 / 13 / 14 / 15 / 16 / 17 / 18 / 19 / 20 / 21 / 22 / 23 / 24 / 27 / 30 / 32	7 8 10 12 14	PH3 PH4	455x180x51	T30 T40 T45 T55 T60	702214 1235	<b>304,-</b>

7101



## ATORN® Torque screwdriver with replaceable blades

- Simple and precise torque adjustment
- Precise release when the set torque is reached, clearly audible and tangible
- Blades made of chrome molybdenum vanadium alloy
- Ergonomic 2-component handle
- Replaceable blades for maximum flexibility in all application areas
- Other set configurations and individual blades available on request



### Torque handle

- Including adjustment key, user manual and calibration certificate

Torque N·m	art.no.	€
0.6 - 1.5	<b>703732 0615</b>	<b>57,-</b>
1.5 - 3.0	703732 1530	57,-
3.0 - 5.4	703732 3054	57,-

7109

### Replaceable blades

- Black tip for a precise fit

Description	L mm	Hexagonal support in	art.no.	€
Torx T6	170	1/4	<b>702733 0060</b>	<b>5,10</b>
Torx T7	170	1/4	702733 0070	5,10
Torx T8	170	1/4	702733 0080	5,10
Torx T9	170	1/4	702733 0090	5,10
Torx T10	170	1/4	702733 0100	5,10
Torx T15	170	1/4	702733 0150	5,10
Torx T20	170	1/4	702733 0200	5,10
Torx T25	170	1/4	702733 0250	5,10
Torxplus 6IP	170	1/4	702733 1060	5,10
Torxplus 7IP	170	1/4	702733 1070	5,10
Torxplus 8IP	170	1/4	702733 1080	5,10
Torxplus 9IP	170	1/4	702733 1090	5,10
Torxplus 10IP	170	1/4	702733 1100	5,10
Torxplus 15IP	170	1/4	702733 1150	5,10
Torxplus 20IP	170	1/4	702733 1200	5,10
Torxplus 25IP	170	1/4	702733 1250	5,10

7109

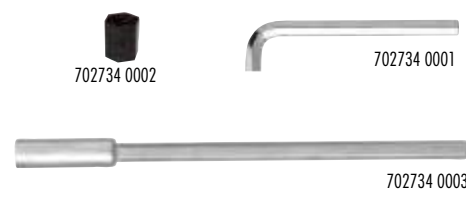
Description	L mm	Hexagonal support in	art.no.	€
Flat head 3.0 x 0.5 mm	170	1/4	702733 2030	5,10
Flat head 3.5 x 0.6 mm	170	1/4	702733 2035	5,10
Flat head 4.0 x 0.8 mm	170	1/4	702733 2040	5,10
Phillips PH 0	170	1/4	702733 3000	5,10
Phillips PH 1	170	1/4	702733 3010	5,10
Phillips PH 2	170	1/4	702733 3020	5,10
Pozidriv PZ 0	170	1/4	702733 4000	5,10
Pozidriv PZ 1	170	1/4	702733 4010	5,10
Pozidriv PZ 2	170	1/4	702733 4020	5,10
Hex wr. width 2.0	170	1/4	702733 5020	5,10
Hex wr. width 2.5	170	1/4	702733 5025	5,10
Hex wr. width 3.0	170	1/4	702733 5030	5,10
Hex wr. width 4.0	170	1/4	702733 5040	5,10

7109

### Accessories

Description	art.no.	€
Adjustment key	<b>702734 0001</b>	<b>3,87</b>
Locking seal	702734 0002	4,23
Bit holder blade, 1/4 inch bit mount	702734 0003	7,75

7109



**ATORN® Torque limiter****NEW****Controlled screw tightening  
from 0.6 to 5.5 Nm**

- **Precise deviation tolerance  $\pm 10\%$**
- Tangible release and clicking sound when torque is reached
- Integrated slip clutch prevents unintentional overtightening of the screw connection
- Coloured outer sleeve with printed torque value
- Colour-coded, matching industrial bit inserts made from hardened bit steel 58-60 HRC
- Body made from carbon steel with 43-48 HRC, electrically nickel-plated
- Ergonomically shaped 2-component screwdriver handle and 2-component T-handle with optimum force transmission properties
- Customised quick-change chuck with bit lock
- **Advantage:** optimum security against overtightening of sensitive screw connections, easy handling thanks to colour coding system



703801 0019

**Sets**

- Blade length: 50 mm
- Handle length: 100 mm

Tip size	Min./max. torque measuring range	art.no.	€
TX 6, 7, 8, 9, 10, 15, TX-IP 6, 7, 8, 9, 10, 15	0.6 - 3.0 Nm	<b>703801</b> 0019	<b>178,-</b>
TX 6, 7, 8, 9, 10, 15, 20, 25, TX-IP 6, 7, 8, 9, 10, 15, 20, 25, 6KT 2 mm, 2.5 mm, 3 mm, 4 mm	0.6 - 5.5 Nm	703801 0030	<b>250,-</b>

7109



703801 0030

**Torque limiter**

- Fixed pre-set torque values
- Handle length 53 mm

Min./max. torque measuring range	Colour	art.no.	€
0.6	red	<b>703901</b> 0006	<b>20,80</b>
0.9	brown	703901 0009	<b>20,80</b>
1.2	green	703901 0012	<b>20,80</b>
1.4	yellow	703901 0014	<b>20,80</b>
2.0	purple	703901 0020	<b>20,80</b>
3.0	blue	703901 0030	<b>20,80</b>
5.0	grey	703901 0050	<b>20,80</b>
5.5	black	703901 0055	<b>20,80</b>

7109

**Bit holder for torque limiter**

- Ergonomically shaped 2-component handle
- Optimum force transmission
- Customised quick-change chuck with bit lock

Designation	art.no.	€
T-handle bit quick-release 1/4 inch mount	<b>703905</b> 0001	<b>16,70</b>

7109





**TX bit holder 1/4 inch**

- Hardened bit steel with 58 - 60 HRC
- Colour ring coding
- Blade length 50 mm

Tip size	Colour	art.no.	€
TX6	red	<b>703902</b> 0006	<b>2,55</b>
TX7	brown	703902 0007	<b>2,55</b>
TX8	green	703902 0008	<b>2,55</b>
TX9	yellow	703902 0009	<b>2,55</b>
TX10	purple	703902 0010	<b>2,55</b>
TX15	blue	703902 0015	<b>2,55</b>
TX20	grey	703902 0020	<b>2,55</b>
TX25	black	703902 0025	<b>2,55</b>

7109

**TX-IP bit holder 1/4 inch**

- Hardened bit steel with 58 - 60 HRC
- Colour ring coding
- Blade length 50 mm

Tip size	Colour	art.no.	€
TX-IP6	red	<b>703903</b> 0006	<b>2,75</b>
TX-IP7	brown	703903 0007	<b>2,75</b>
TX-IP8	green	703903 0008	<b>2,75</b>
TX-IP9	yellow	703903 0009	<b>2,75</b>
TX-IP10	purple	703903 0010	<b>2,75</b>
TX-IP15	blue	703903 0015	<b>2,75</b>
TX-IP20	grey	703903 0020	<b>2,75</b>
TX-IP25	black	703903 0025	<b>2,75</b>

7109

**Hex bit holder 1/4 inch**

- Hardened bit steel with 58 - 60 HRC
- Colour ring coding
- Blade length 50 mm

Tip size	Colour	art.no.	€
6KT 2 mm	green	<b>703904</b> 0020	<b>2,95</b>
6KT 2.5 mm	purple	703904 0025	<b>2,95</b>
6KT 3 mm	blue	703904 0030	<b>2,95</b>
6KT 4 mm	grey	703904 0040	<b>2,95</b>

7109



Tangential is...

... highly economical.

**ATORN**<sup>®</sup>  
Performance demands quality



## ATORN® Torque wrenches

- Haptic and acoustic adjustment aid
- User-friendly thanks to an ergonomically shaped handle with a structured comfort-grip surface
- Clearly audible and tangible short-path release when the set torque is reached
- Quickly secured and released via locking ring
- Dual scale with N-m and lbf-ft.
- Viewing window protects the scale against damage
- High-quality permanent laser marking
- Shipped in protective tube packaging incl. a hanging fixture
- Made in Germany



### Lever-reversible ratchet

- Accuracy ± 3 % of scale value, ± 4 % with 1 - 6 Nm torque wrench
- 1/2 inch ratchet with 32 teeth, 3/8 inch ratchet with 30 teeth, 1/4 inch ratchet with 20 teeth
- DIN EN ISO 6789:2003 (D) square in accordance with DIN 3120, ISO 1174-1

Torque N-m	Tip size	Scale division N-m	L mm	art.no.	€
1-6	1/4 inch	0.1	234	<b>702602 0001</b>	<b>211,-</b>
2.5-25	1/4 inch	0.25	274	702602 0002	204,-
10-60	3/8 inch	0.5	355	702602 0003	211,-
20-120	1/2 inch	1.0	456	702602 0004	195,-
40-200	1/2 inch	1.0	551	702602 0005	211,-
60-320	1/2 inch	2.0	621	702602 0006	239,-

7109



### For snap-in tools

- Accuracy ± 3 % of scale value
- Including serial number and certificate
- DIN EN ISO 6789:2003 (D)

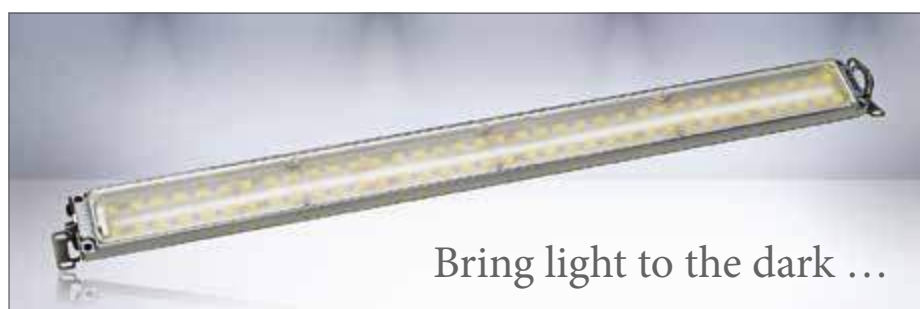


For snap-in tools, please visit the online shop



7109

Torque N-m	Quadratic mm	Scale division N-m	L mm	art.no.	€
2.5-25	9x12	0.25	258	<b>702603 0001</b>	<b>146,-</b>
10-60	9x12	0.5	312	702603 0002	148,50
20-120	14x18	1.0	393	702603 0003	155,50
40-200	14x18	1.0	488	702603 0004	175,-
60-320	14x18	2.0	558	702603 0005	202,-



Bring light to the dark ...

... with LED.

**ATORN®**  
Performance demands quality

## ATORN® Pliers

**DIN ISO 5745** **DIN ISO 5749** **DIN ISO 5746** **DIN ISO 5748** **DIN ISO 8976**

- Chrome vanadium steel
- Handle PVC-coated, joint polished or with 2-component (2K) covering, high-gloss polished, chrome-plated

### Flat-nose pliers with short jaws

- DIN ISO 5745

Total length mm	PVC dipped handle art.no.	€	2K handle art.no.	€
140	<b>710498</b> 0140	<b>10,60</b>		
160	710498 0160	11,-	<b>710499</b> 0160	<b>13,05</b>
	7130		7130	

### Flat-nose pliers with long jaws

- DIN ISO 5745

Total length mm	PVC dipped handle art.no.	€	2K handle art.no.	€
140	<b>710501</b> 0140	<b>12,25</b>		
160	710501 0160	12,85	<b>710505</b> 0160	<b>15,90</b>
	7130		7130	

### Radio or telephone pliers (needle-nose pliers) with cutting edge

- DIN ISO 5745

Total length mm	PVC dipped handle art.no.	€	2K handle art.no.	€
140	<b>710520</b> 0140	<b>12,05</b>		
160	710520 0170	12,25	<b>710525</b> 0170	<b>15,90</b>
200	710520 0200	15,70	710525 0200	18,95
	7130		7130	

### Radio or telephone pliers (needle-nose pliers) with long handles

- DIN ISO 5745

Total length mm	PVC dipped handle art.no.	€
280	<b>710526</b> 0280	<b>19,35</b>
	7130	

### Radio or telephone pliers (needle-nose pliers) with cutting edge

- DIN ISO 5749
- 45° angled tip

Total length mm	PVC dipped handle art.no.	€	2K handle art.no.	€
200	<b>710530</b> 0200	<b>18,35</b>	<b>710535</b> 0200	<b>21,60</b>
	7130		7130	

### Radio or telephone pliers (needle-nose pliers) with long handles

- DIN ISO 5745
- 45° angled tip

Total length mm	PVC dipped handle art.no.	€
280	<b>710536</b> 0280	<b>21,60</b>
	7130	

### Diagonal cutting pliers

- DIN ISO 5749

Total length mm	Design	PVC dipped handle art.no.	€	2K handle art.no.	€
145	Hardened cutting edges for hardened steel wire (piano wire)	<b>710145</b> 0145	<b>11,80</b>		
160	Special steel for hardened steel wire (piano wire)	710145 0161	11,80	<b>710150</b> 0161	<b>17,10</b>
		7130		7130	

### Heavy-duty diagonal cutting pliers

- DIN ISO 5749
- Special steel for hardened steel wire (piano wire)

Total length mm	PVC dipped handle art.no.	€	2K handle art.no.	€
160	<b>710155</b> 0160	<b>15,90</b>	<b>710160</b> 0160	<b>24,50</b>
180	710155 0180	16,90	710160 0180	26,70
200	710155 0200	18,95	710160 0200	27,90
	7130		7130	



Continued on next page >>>

**Combination pliers**

- DIN ISO 5746

Total length mm	Design	PVC dipped handle		2K handle	
		art.no.	€	art.no.	€
160	With bevels	<b>710135</b> 0165	<b>10,20</b>	<b>710140</b> 0165	<b>13,65</b>
180	With bevels	710135 0180	<b>10,60</b>	710140 0180	<b>14,65</b>
200	With bevels	710135 0200	<b>12,05</b>	710140 0200	<b>16,50</b>
		7130		7130	



**Heavy-duty end cutting pliers**

- DIN ISO 5748
- Made from special steel, for hardened steel wire (piano wire)

Total length mm	PVC dipped handle		2K handle	
	art.no.	€	art.no.	€
160	<b>710185</b> 0155	<b>21,60</b>	<b>710190</b> 0155	<b>24,80</b>
200	710185 0200	<b>24,20</b>		
	7130		7130	



**Three-way pliers**

- Flat-nose pliers
- Wire-stripping pliers
- Crimping pliers



Total length mm	2K handle	
	art.no.	€
160	<b>710134</b> 0160	<b>19,95</b>
	7130	



**Water pump pliers, chrome vanadium**

- DIN ISO 8976
- With integrated groove joint and pinch guard
- Chrome vanadium

Total length mm	2K handle	
	art.no.	€
250	<b>710130</b> 0245	<b>22,70</b>
	7130	



**Pliers set**

- 4 pcs. in a plastic case

Contents	art.no.	€
	7130	



Precision ...

... but digital.

**ATORN**<sup>®</sup>  
Performance demands quality

**ATORN® VDE pliers**DIN ISO  
5745DIN ISO  
5749DIN ISO  
5746

- Specially tailored to the strict safety guidelines of IEC 900, DIN EN 60900 and VDE 0680/Part 2

- Chrome vanadium steel
- High-gloss polished, chrome-plated
- Directly sprayed 1,000 V insulating handles

**VDE flat-nose pliers with long jaws**

- DIN ISO 5745

Total length mm	art.no.	€
160	<b>711036</b> 0160	<b>19,55</b>
7130		

**VDE round-nose pliers with long jaws**

- DIN ISO 5745

Total length mm	art.no.	€
160	<b>711038</b> 0160	<b>20,80</b>
7130		

**VDE radio or telephone pliers (needle-nose pliers)**

- DIN ISO 5745
- With cutting edge

Total length mm	art.no.	€
160	<b>711050</b> 0170	<b>17,70</b>
200	711050 0200	<b>22,-</b>
7130		

**VDE radio or telephone pliers (needle-nose pliers)**

- DIN ISO 5745
- With cutting edge
- 45° angled tip

Total length mm	art.no.	€
200	<b>711055</b> 0200	<b>24,90</b>
7130		

**VDE diagonal cutting pliers**

- DIN ISO 5749

Total length mm	art.no.	€
140	<b>711045</b> 0140	<b>18,95</b>
160	711045 0160	<b>20,20</b>
7130		

**VDE heavy-duty diagonal cutting pliers, made from special steel**

- DIN ISO 5749

Total length mm	art.no.	€
200	<b>711039</b> 0200	<b>31,20</b>
7130		

**VDE combination pliers**

- DIN ISO 5746

Total length mm	art.no.	€
160	<b>711040</b> 0160	<b>17,30</b>
180	711040 0180	<b>18,35</b>
200	711040 0200	<b>20,60</b>
7130		

**VDE wire-stripping pliers**

- With grub screw and opening spring, for cables and stranded wires up to Ø 5 mm

Total length mm	art.no.	€
160	<b>711060</b> 0160	<b>20,60</b>
7130		

**VDE pliers set in a plastic case**

- 4 pcs.

Contents	art.no.	€
VDE combination pliers 180 mm (711040 0180), VDE radio or telephone pliers 200 mm (711050 0200), VDE diagonal cutting pliers 160 mm (711045 0160), VDE wire-stripping pliers 160 mm (711060 0160)	<b>711061</b> 0004	<b>78,40</b>
7130		



**ATORN® Water pump pliers****DIN ISO  
8976**

- Chrome vanadium steel
- With slip box joint and safety pinch guard
- Self-clamping on the workpiece, saving effort and providing a non-slip grip

Total length mm	art.no.	€
175	<b>710110</b> 0180	<b>13,45</b>
240	710110 0240	14,45
300	710110 0300	21,40

7130

**ATORN® Corner pipe wrench****DIN  
5234**

- Chrome vanadium steel, forged and powder-coated
- Double T-profile wrench lever
- Induction-hardened jaws
- Teeth offset against the direction of rotation
- Reinforced clamp
- Adjusting nut locking mechanism

**45° angled jaw**

for pipe Ø in	Total length mm	Jaw aperture mm	art.no.	€
1"	320	0 - 42	<b>712001</b> 0010	<b>37,60</b>
1 1/2"	430	0 - 60	712001 0015	46,70
2"	570	0 - 70	712001 0020	67,40

7130

**90° angled jaw**

for pipe Ø in	Total length mm	Jaw aperture mm	art.no.	€
1"	310	0 - 42	<b>712002</b> 0010	<b>29,90</b>
1 1/2"	420	0 - 60	712002 0015	43,40
2"	560	0 - 70	712002 0020	64,30

7130

**S-jaw head**

for pipe Ø in	Total length mm	Jaw aperture mm	art.no.	€
1"	315	0 - 42	<b>712011</b> 0010	<b>30,50</b>
1 1/2"	420	0 - 60	712011 0015	41,10
2"	530	0 - 70	712011 0020	69,50

7130



PROTECTION FROM  
**HEAD  
TO  
TOE**

**uvex**

**UVEX**  
Occupational safety  
577 pages  
Art.no. 019900 5470

Overview of all free manufacturers' catalogues  
on page 16/17



**ATORN® Circlip pliers**

**DIN 5254 B**   **DIN 5256 C**   **DIN 5256 D**   **DIN 5254 A**

- Chrome vanadium steel, polished joint
- PVC-coated handle

**External pliers, tips angled 90°, type B**

- DIN 5254 B

Type	for external fixture Ø mm	Total length mm	art.no.	€
A 01	3 - 10	139	<b>711555</b> 1001	<b>11,80</b>
A 11	10 - 25	140	711555 1011	<b>11,80</b>
A 21	19 - 60	180	711555 1021	<b>12,25</b>
A 31	40 - 100	225	711555 1031	<b>14,05</b>
A 41	85 - 140	310	711555 1041	<b>24,10</b>

7130

**Internal pliers, straight tips, type C**

- DIN 5256 C

Type	for interior securing Ø mm	Total length mm	art.no.	€
J 0	8 - 13	139	<b>711560</b> 2000	<b>9,80</b>
J 1	12 - 25	140	711560 2001	<b>9,80</b>
J 2	19 - 60	180	711560 2002	<b>10,20</b>
J 3	40 - 100	225	711560 2003	<b>12,25</b>
J 4	85 - 140	310	711560 2004	<b>20,60</b>

7130

**Internal pliers, tips angled 90°, type D**

- DIN 5256 D

Type	for interior securing Ø mm	Total length mm	art.no.	€
J 01	8 - 13	139	<b>711565</b> 3010	<b>10,60</b>
J 11	12 - 25	140	711565 3011	<b>10,60</b>
J 21	19 - 60	180	711565 3021	<b>11,-</b>
J 31	40 - 100	225	711565 3031	<b>12,85</b>
J 41	85 - 140	310	711565 3041	<b>22,40</b>

7130

**External pliers, straight tips, type A**

- DIN 5254 A

Type	for external fixture Ø mm	Total length mm	art.no.	€
A 0	3 - 10	139	<b>711550</b> 0000	<b>11,40</b>
A 1	10 - 25	140	711550 0001	<b>11,40</b>
A 2	19 - 60	180	711550 0002	<b>11,60</b>
A 3	40 - 100	225	711550 0003	<b>13,65</b>
A 4	85 - 140	310	711550 0004	<b>23,40</b>

7130

**Circlip pliers sets**

- DIN 5254A/5256C
- For internal and external circlips

Description	Contents	art.no.	€
8-pcs. in box	J1, J2, J11, J21, A1, A2, A11, A21	<b>710490</b> 1008	<b>87,50</b>
8-pcs. in a roll-up case	J1, J2, J11, J21, A1, A2, A11, A21	710490 2008	<b>95,60</b>

7130



## ATORN® Electronic pliers

**DIN ISO 9655** **DIN ISO 9654**

- Chrome vanadium steel
- Joint surfaces polished and phosphate-treated
- 2-component shell (2K)

### Needle-nose electronics pliers, 30° angled tip

- DIN ISO 9655

Total length mm	art.no.	€
125	<b>711506</b> 0125	<b>21,20</b>
	7130	



### Needle-nose electronics pliers, straight

- DIN ISO 9655

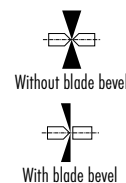
Total length mm	art.no.	€
125	<b>711510</b> 2130	<b>19,35</b>
	7130	



### Diagonal cutting electronics pliers, made from special steel

- DIN ISO 9654

Total length mm	Design	art.no.	€
112	For hardened steel wire (piano wire)	<b>711515</b> 3110	<b>19,35</b>
112	Without blade bevel, for copper wire, diameter 0.5-2.0 mm	711515 3111	<b>20,40</b>
112	With retaining spring, for hardened steel wire (piano wire)	711515 3112	<b>22,80</b>
112	With retaining spring, without blade bevel, for copper wire, diameter 0.5-2.0 mm	711515 3113	<b>24,10</b>
		7130	



## ATORN® Knife

Description	art.no.	€
Stainless steel blade with serrated edge, non-slip, blade locking button	<b>711001</b> 0115	<b>14,45</b>
Stainless steel blade with 2 notches, non-slip, locking blade	711001 0116	<b>15,70</b>
	7129	



711001 0115



711001 0116

## ATORN® Utility knife

- Extremely robust and smooth
- Ergonomically shaped full metal casing with stainless steel blade guide

Description	art.no.	€
Utility knife, auto-lock mechanism, 9 mm blade	<b>711032</b> 0009	<b>11,20</b>
Utility knife, locking cog, 18 mm blade	711032 0018	<b>16,50</b>
	7129	



711032 0009



711032 0018

## Tool sets

- 6-piece sets
- Shank with baked enamel finish
- **Material:** Chrome vanadium air-hardened steel

Packaging	Contents	art.no.	€
6-pcs. plastic stand	1x flat chisel 125 x 10 x 12 mm 1x flat chisel 150 x 12 x 16 mm 1x cross-cut chisel 125 x 10 mm 1x centre punch 120 x 10 mm 1x drift punch 120 x 10 x 3 mm 1x drift punch 120 x 10 x 4 mm	720135 0006	20,30
6-pcs. metal cartridge	1x flat chisel 125 x 10 x 12 mm 1x flat chisel 150 x 12 x 16 mm 1x cross-cut chisel 125 x 10 mm 1x centre punch 120 x 10 mm 1x drift punch 120 x 10 x 3 mm 1x drift punch 120 x 10 x 4 mm	720135 1006	26,-

7134



720135 0006



720135 1006

## Centre punch

**DIN  
7250**

- Octagonal
- Impact-resistant head, shank with baked enamel finish
- **Material:** Chrome vanadium air-hardened steel

L mm	Shank Ø mm	art.no.	€
100	8	720110 1008	1,57
120	10	720110 1209	1,72
120	12	720110 1210	1,91
150	12	720110 1211	2,12

7134



## ATORN® Wad punches

**DIN  
7200 A**

- Conical relief, head ground and polished, baked enamel finish
- **Material:** Die-forged special steel

### Individual

Ø mm	art.no.	€
2	720112 0002	4,07
3	720112 0003	4,07
4	720112 0004	4,07
5	720112 0005	4,05
6	720112 0006	4,05
7	720112 0007	4,05
8	720112 0008	4,33
9	720112 0009	4,45
10	720112 0010	4,75
11	720112 0011	5,85
12	720112 0012	6,40
13	720112 0013	6,90
14	720112 0014	7,40
15	720112 0015	7,90
16	720112 0016	8,55

7134

Ø mm	art.no.	€
17	720112 0017	9,15
18	720112 0018	9,65
19	720112 0019	10,-
20	720112 0020	11,15
21	720112 0021	11,90
22	720112 0022	12,50
23	720112 0023	12,85
24	720112 0024	13,35
25	720112 0025	15,50
26	720112 0026	15,90
27	720112 0027	16,70
28	720112 0028	19,05
29	720112 0029	19,65
30	720112 0030	19,85
31	720112 0031	21,10

7134



Ø mm	art.no.	€
32	720112 0032	21,70
33	720112 0033	23,40
34	720112 0034	23,50
35	720112 0035	24,40
40	720112 0040	31,80
42	720112 0042	42,20
44	720112 0044	43,10
46	720112 0046	44,20
48	720112 0048	46,30
50	720112 0050	48,50
55	720112 0055	78,90
60	720112 0060	105,-
65	720112 0065	116,-
70	720112 0070	158,-

7134

### Sets

Packaging	Contents	art.no.	€
9-pcs. roll-up case	3, 5, 7, 9, 11, 13, 15, 17, 19 mm (1 of each)	720113 0119	55,90
15-pcs. roll-up case	2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm (1 of each)	720113 0109	144,-
19-pcs. roll-up case	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 mm (1 of each)	720113 0115	119,50

7134



720113 0115

## Drift

**DIN  
6458**

- Octagonal
- Impact-resistant head, shank with baked enamel finish
- **Material:** Chrome vanadium air-hardened steel

### Single

L mm	Shank Ø mm	Point Ø mm	art.no.	€
120	10	1	<b>720125 0001</b>	<b>1,71</b>
120	10	2	720125 0002	1,71
120	10	3	720125 0003	1,71
120	10	4	720125 0004	1,71
120	10	5	720125 0005	1,71
120	10	6	720125 0006	1,71
120	12	7	720125 0007	1,71
120	12	8	720125 0008	1,72
120	12	10	720125 0010	2,12

7134

### Sets

- DIN 7255

Packaging	Contents	art.no.	€
6-pcs. plastic stand	Drift punches (1 of each): 120 x 10 x 1, 2, 3, 4, 5 mm 1 centre punch 120 x 10 x 4 mm	<b>720130 0006</b>	<b>11,45</b>
6-pcs. metal cartridge	Drift punches (1 of each): 120 x 10 x 1, 2, 3, 4, 5 mm 1 centre punch 120 x 10 x 4 mm	720130 1006	20,10

7134



720130 0006



720130 1006

## Pin punch

**DIN  
6450C**

- Octagonal
- Impact-resistant head, shank with baked enamel finish, driving surface blank ground
- **Material:** Chrome vanadium air-hardened steel

### Single

L mm	Shank Ø mm	Point Ø mm	art.no.	€
150	10	2	<b>720115 0002</b>	<b>2,43</b>
150	10	2.5	720115 0025	2,41
150	10	3	720115 0003	2,24
150	10	3.5	720115 0035	2,41
150	10	4	720115 0004	2,24
150	10	4.5	720115 0045	2,41
150	10	5	720115 0005	2,24
150	10	6	720115 0006	2,24
150	12	7	720115 0007	2,62
150	12	8	720115 0008	2,62
150	12	10	720115 0010	2,62
150	14	12	720115 0012	3,70

7134



720120 0006



720120 1006

### Sets

Shank Ø mm	Packaging	Contents	art.no.	€
10	6-pcs. plastic stand	3, 4, 5, 6, 8, 10 mm (1 of each)	<b>720120 0006</b>	<b>14,45</b>
10	6-pcs. metal cartridge	3, 4, 5, 6, 8, 10 mm (1 of each)	720120 1006	21,70

7134

**ATORN® Soft face hammer**

- Inserts: Cellulose acetate, blue, both sides
- Tough / oil and grease-resistant
- Base body made from high-quality die-cast zinc with impact-resistant handle
- Wooden handle made from seasoned ash
- Ergonomically shaped and painted

**Soft face hammer**

Head Ø mm	L1 mm	L mm	Weight kg	art.no.	€
25	86	270	0.24	<b>720567</b> 0025	<b>13,05</b>
30	95	280	0.37	720567 0030	<b>18,35</b>
40	107	325	0.63	720567 0040	<b>22,80</b>
50	115	340	0.95	720567 0050	<b>32,-</b>

7116

**Inserts**

Head Ø mm	art.no.	€
25	<b>720568</b> 0025	<b>3,16</b>
30	720568 0030	<b>3,72</b>
40	720568 0040	<b>7,15</b>
50	720568 0050	<b>11,-</b>

7116

**ATORN® Soft face hammer, non-rebound**

- Replaceable striking heads made from shatter-proof polyurethane
- Shaft made from precision steel tubing, powder-coated
- Ergonomically designed rubber handle
- Hammer body filled with cast iron balls for rebound-free work
- Full impact on metal while protecting joints and muscles by preventing rebound

**Soft face hammer**

Head Ø mm	L1 mm	L mm	Weight kg	art.no.	€
30	116	351	0.46	<b>720565</b> 0030	<b>29,-</b>
40	126	376	0.58	720565 0040	<b>33,10</b>
50	136	386	0.76	720565 0050	<b>43,80</b>

7116

**Inserts**

Head Ø mm	art.no.	€
30	<b>720566</b> 0030	<b>3,16</b>
40	720566 0040	<b>4,53</b>
50	720566 0050	<b>6,05</b>

7116

**ATORN® 3K engineering hammer**

- With unbreakable 3-component handle (aluminium core, polyamide and rubber components)
- Forged protective shaft collar and additional protective shaft sleeve
- Vibration-free and joint-friendly hammering
- Ergonomic and non-slip handling

Weight kg	art.no.	€
0.3	<b>720506</b> 0300	<b>19,35</b>
0.5	720506 0500	<b>22,20</b>
1.0	720506 1000	<b>31,40</b>
1.5	720506 1500	<b>34,80</b>
2.0	720506 2000	<b>43,80</b>

7116



## ATORN® Metal saw bow

- Solid cast aluminium
- Ergonomic form
- Comfortable use with soft rubber grip and front handle
- Quick-clamping in handle
- Blade held by non-detachable pin
- **Supplied** without saw blade

Sheet length mm	Weight kg	art.no.	€
300	0.65	<b>725126 0300</b>	<b>24,40</b>

7163



## ATORN® Handsaw blades

- **HSS:** single-sided, non-bending, flexibly part-hardened blade made from medium-high-alloy high-speed steel
- **HSS bi-metal:** single-sided, teeth made from hardened HSS; back made from spring steel, extremely flexible
- Unit prices when purchased in PU

ATORN No.  
51581324

725150 3024

### HSS

L mm	Height mm	Width mm	Tooth per inch	☒	art.no.	€
300	13	0.65	24	10	<b>725130 3024</b>	<b>1,38</b>

7163

### HSS bi-metal

L mm	Height mm	Width mm	Tooth per inch	☒	art.no.	€
300	13	0.63	18	10	<b>725150 3018</b>	<b>1,28</b>
300	13	0.63	24	10	<b>725150 3024</b>	<b>1,28</b>
300	13	0.63	32	10	<b>725150 3032</b>	<b>1,28</b>

7163

## ATORN® Screw clamps

### Torque screw clamp

- Bright-drawn profile rail with grooves on both sides
- Sliding and fixed brackets made from high-quality malleable cast iron
- Movable pressure plate with plastic protective cap



Clamping width mm	Projection mm	art.no.	€
120	65	<b>740101 0120</b>	<b>12,05</b>
160	80	740101 0160	14,10
200	100	740101 0200	19,55
250	120	740101 0250	23,80
300	140	740101 0300	29,40
400	175	740101 0400	35,80
500	120	740101 0500	36,20
600	120	740101 0600	38,-
800	120	740101 0800	42,80
1,000	120	740101 1000	48,-
1,500	120	740101 1500	58,10
2,000	120	740101 2000	71,10

7120



### All-steel clamp

- Fixed clamp made from hardened and tempered profile steel
- Sliding clamp made from hardened, tempered and galvanised die-forged steel
- Movable pressure plate



Clamping width mm	Projection mm	art.no.	€
120	60	<b>740110 0120</b>	<b>14,45</b>
160	80	740110 0160	17,40
200	100	740110 0200	23,20
250	120	740110 0250	28,10
300	140	740110 0300	35,20
400	120	740110 0400	40,60
500	120	740110 0500	44,10
600	120	740110 0600	46,60

7120





## PRYOR Interchangeable steel type

- Special steel with precision design
- Suitable for marking steel up to 1,300 N/mm<sup>2</sup> in strength
- Set consists of 1 hand-held holder and 100 individual steel type pieces
- Several pieces of steel type can be inserted side by side in the holder.
- The precise design of the holder and the steel type produces clean, clear lettering with uniform spacing.
- For labelling name or rating plates as well as tools, machine parts etc.
- **Normal type:** the punched marking is directly legible



A	A	B	B	C	C	D	D	E	E	F	F	G	G	H	H	I	I				
J	J	K	K	L	L	M	M	N	N	O	O	P	P	Q	Q	R	R				
S	S	T	T	U	U	V	V	W	W	X	X	Y	Y	Z	Z	&	/				
/	-	-	-	.	.	1	1	1	1	2	2	2	2	3	3	3	4	4			
4	4	5	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	0	0	0	0

Set composition (complete sets)

### Complete sets with hand-held holders

Typeface height mm	max. support capacity of holder	art.no.	€
1.5	12	731001 0015	420,-
2.5	12	731001 0025	420,-
3.0	9	731001 0030	420,-
5.0	8	731001 0050	470,-
6.0	6	731001 0060	849,-

### Hand-held holder, individual

Type	for font height mm	art.no.	€
H3,2-20	1.0 / 1.5	731010 1015	101,-
H6,35-29	2.5 / 3.0	731010 2530	112,-
H8,0-39	5.0	731010 0050	122,50
H9,6-40	6.0	731010 0060	290,-

### Steel type sets

- Prices per set

Typeface height mm	Numbers 0-9		Letters A-Z	
art.no.	€	art.no.	€	
1.5	731030 0200	64,60	731040 0200	168,-
2.5	731030 0300	64,60	731040 0300	168,-
3.0	731030 0400	64,60	731040 0400	168,-
5.0	731030 0500	74,80	731040 0500	192,50
6.0	731030 0600	111,-	731040 0600	290,-

### 10 identical steel type pieces

- Unit prices when purchased in PU

Engraving	1,5 mm		2,5 mm		3,0 mm		5,0 mm		6,0 mm	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
0	731050 0200	9,30	731050 0300	9,30	731050 0400	9,30	731050 0500	10,45	731050 0600	15,10
1	731050 0201	9,30	731050 0301	9,30	731050 0401	9,30	731050 0501	10,45	731050 0601	15,10
2	731050 0202	9,30	731050 0302	9,30	731050 0402	9,30	731050 0502	10,45	731050 0602	15,10
3	731050 0203	9,30	731050 0303	9,30	731050 0403	9,30	731050 0503	10,45	731050 0603	15,10
4	731050 0204	9,30	731050 0304	9,30	731050 0404	9,30	731050 0504	10,45	731050 0604	15,10
5	731050 0205	9,30	731050 0305	9,30	731050 0405	9,30	731050 0505	10,45	731050 0605	15,10
6	731050 0206	9,30	731050 0306	9,30	731050 0406	9,30	731050 0506	10,45	731050 0606	15,10
7	731050 0207	9,30	731050 0307	9,30	731050 0407	9,30	731050 0507	10,45	731050 0607	15,10
8	731050 0208	9,30	731050 0308	9,30	731050 0408	9,30	731050 0508	10,45	731050 0608	15,10
9	731050 0209	9,30	731050 0309	9,30	731050 0409	9,30	731050 0509	10,45	731050 0609	15,10
A	731050 0220	9,30	731050 0320	9,30	731050 0420	9,30	731050 0520	10,45	731050 0620	15,10
B	731050 0221	9,30	731050 0321	9,30	731050 0421	9,30	731050 0521	10,45	731050 0621	15,10
C	731050 0222	9,30	731050 0322	9,30	731050 0422	9,30	731050 0522	10,45	731050 0622	15,10
D	731050 0223	9,30	731050 0323	9,30	731050 0423	9,30	731050 0523	10,45	731050 0623	15,10
E	731050 0224	9,30	731050 0324	9,30	731050 0424	9,30	731050 0524	10,45	731050 0624	15,10
F	731050 0225	9,30	731050 0325	9,30	731050 0425	9,30	731050 0525	10,45	731050 0625	15,10
G	731050 0226	9,30	731050 0326	9,30	731050 0426	9,30	731050 0526	10,45	731050 0626	15,10
H	731050 0227	9,30	731050 0327	9,30	731050 0427	9,30	731050 0527	10,45	731050 0627	15,10
I	731050 0228	9,30	731050 0328	9,30	731050 0428	9,30	731050 0528	10,45	731050 0628	15,10
J	731050 0229	9,30	731050 0329	9,30	731050 0429	9,30	731050 0529	10,45	731050 0629	15,10
K	731050 0230	9,30	731050 0330	9,30	731050 0430	9,30	731050 0530	10,45	731050 0630	15,10

### Font size measurement



1.0mm	.....
1.5mm	.....
2.0mm	.....
2.5mm	.....
3.0mm	.....
4.0mm	.....
5.0mm	.....
6.0mm	.....
10.0mm	.....

Typeface and font size



Engraving	1,5 mm		2,5 mm		3,0 mm		5,0 mm		6,0 mm	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€	art.no.	€
L	10 731050 0231	9,30	10 731050 0331	9,30	10 731050 0431	9,30	10 731050 0531	10,45	10 731050 0631	15,10
M	10 731050 0232	9,30	10 731050 0332	9,30	10 731050 0432	9,30	10 731050 0532	10,45	10 731050 0632	15,10
N	10 731050 0233	9,30	10 731050 0333	9,30	10 731050 0433	9,30	10 731050 0533	10,45	10 731050 0633	15,10
O	10 731050 0234	9,30	10 731050 0334	9,30	10 731050 0434	9,30	10 731050 0534	10,45	10 731050 0634	15,10
P	10 731050 0235	9,30	10 731050 0335	9,30	10 731050 0435	9,30	10 731050 0535	10,45	10 731050 0635	15,10
Q	10 731050 0236	9,30	10 731050 0336	9,30	10 731050 0436	9,30	10 731050 0536	10,45	10 731050 0636	15,10
R	10 731050 0237	9,30	10 731050 0337	9,30	10 731050 0437	9,30	10 731050 0537	10,45	10 731050 0637	15,10
S	10 731050 0238	9,30	10 731050 0338	9,30	10 731050 0438	9,30	10 731050 0538	10,45	10 731050 0638	15,10
T	10 731050 0239	9,30	10 731050 0339	9,30	10 731050 0439	9,30	10 731050 0539	10,45	10 731050 0639	15,10
U	10 731050 0240	9,30	10 731050 0340	9,30	10 731050 0440	9,30	10 731050 0540	10,45	10 731050 0640	15,10
V	10 731050 0241	9,30	10 731050 0341	9,30	10 731050 0441	9,30	10 731050 0541	10,45	10 731050 0641	15,10
W	10 731050 0242	9,30	10 731050 0342	9,30	10 731050 0442	9,30	10 731050 0542	10,45	10 731050 0642	15,10
X	10 731050 0243	9,30	10 731050 0343	9,30	10 731050 0443	9,30	10 731050 0543	10,45	10 731050 0643	15,10
Y	10 731050 0244	9,30	10 731050 0344	9,30	10 731050 0444	9,30	10 731050 0544	10,45	10 731050 0644	15,10
Z	10 731050 0245	9,30	10 731050 0345	9,30	10 731050 0445	9,30	10 731050 0545	10,45	10 731050 0645	15,10
/	10 731050 0247	9,30	10 731050 0347	9,30	10 731050 0447	9,30	10 731050 0547	10,45	10 731050 0647	15,10
-	10 731050 0248	9,30	10 731050 0348	9,30	10 731050 0448	9,30	10 731050 0548	10,45	10 731050 0648	15,10
.	10 731050 0249	9,30	10 731050 0349	9,30	10 731050 0449	9,30	10 731050 0549	10,45	10 731050 0649	15,10
,	10 731050 0250	9,30	10 731050 0350	9,30	10 731050 0450	9,30	10 731050 0510	10,45	10 731050 0650	15,10
,	10 731050 0252	9,30	10 731050 0352	9,30	10 731050 0452	9,30	10 731050 0552	10,45	10 731050 0652	15,10
&	10 731050 0246	9,30	10 731050 0346	9,30	10 731050 0446	9,30	10 731050 0546	10,45	10 731050 0646	15,10
Spaces	10 731060 0200	3,92	10 731060 0300	3,92	10 731060 0400	3,92	10 731060 0500	3,92	10 731060 0600	4,63
	7140		7140		7140		7140		7140	

## PRYOR Precision hand punch

- Special steel numeral and letter stamps
- Forged blanks with perfectly centred precision engraving
- Stamp hardness 59 - 61 HRC
- Can be used with materials up to 1300 N/mm<sup>2</sup> in strength
- **Normal type:** the punched marking is directly legible
- **Mirrored type:** the punched marking appears on the workpiece as a mirror image
- Numeral sets = 10 pieces, 0-9
- Letter sets = 27 pieces, A-Z and &
- Plastic box
- Individual punch stamps available on request!



### Sets in normal type

Typeface height mm	Shank quadratic x shank length mm	Numbers 0-9		Letters A-Z, &	
		art.no.	€	art.no.	€
1.0	6.3 x 63	730101 0010	18,55	730110 0010	54,80
1.5	6.3 x 63	730101 0015	26,-	730110 0015	61,90
2.0	6.3 x 63	730101 0020	15,70	730110 0020	49,10
2.5	6.3 x 63	730101 0025	16,-	730110 0025	50,90
3.0	6.3 x 63	730101 0030	16,-	730110 0030	50,90
4.0	9.5 x 70	730101 0040	17,-	730110 0040	54,20
5.0	9.5 x 70	730101 0050	18,55	730110 0050	58,70
6.0	9.5 x 70	730101 0060	23,10	730110 0060	64,70
8.0	12.7 x 90	730101 0080	37,20	730110 0080	93,70
10.0	14.3 x 90	730101 0100	48,70	730110 0100	127,-
		7140		7140	

### Mirrored type sets

Typeface height mm	Shank quadratic x shank length mm	Numbers 0-9		Letters A-Z, &	
		art.no.	€	art.no.	€
2.0	6.3 x 63	730120 0020	26,40	730130 0020	73,80
3.0	6.3 x 63	730120 0030	27,40	730130 0030	75,40
4.0	9.5 x 70	730120 0040	29,-	730130 0040	81,60
5.0	9.5 x 70	730120 0050	32,-	730130 0050	86,90
6.0	9.5 x 70	730120 0060	35,-	730130 0060	97,30
		7140		7140	

1.0mm	.....
1.5mm	731050
2.0mm	234ABC
2.5mm	234ABC
3.0mm	234ABC
4.0mm	234ABC
5.0mm	234AB
6.0mm	234A
10.0mm	234

Typeface and font size

### Hand-protecting holder

- Ergonomic, allows a comfortable and more secure grip
- More precise work without the risk of finger injury
- Numeral / letter stamp can be attached using the nylon fabric band

Description	art.no.	€
Hand-protection holder GRIP0004	730100 1004	30,50
	7140	



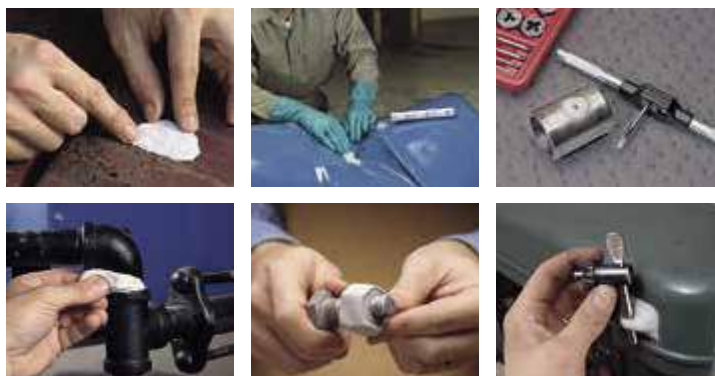
## PIG® Repair putty

- **Bonds like a two-part epoxy resin putty, without oiliness**
- PIG® Repair Putty cements everything - iron, glass, brickwork and most plastics
- **Part A** and **Part B** of the prepared epoxy system are in the same tube - simply knead the putty and apply
- Solid in 20 minutes, harder than cement after one hour
- Solvent-free, contains no VOC
- Can be stored unopened for at least two years (at 20 - 25°C, protect against direct sunlight)

### Unit prices (graduated)

Can be used everywhere for quick, effortless repairs:

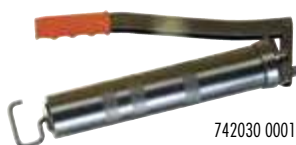
- Sealing leaks in steel drums
- Repairing holes and cracks in pipes
- Mending leaks on steel and fibreglass tanks
- Restoring or re-cutting threads
- Sealing cracks in casings
- Filling and smoothing holes and hollows in floors
- Repairing steam conduits and radiators
- Sealing leaky connections
- Filling nail holes in walls
- Repairing faulty toilets
- Closing multiple cavities during injection moulding
- Reinforcing cast steel moulds
- Sealing holes in castings during production
- Making temporary repairs to heating ducts
- Repairing transformers, porcelain bushings and re-closers
- Patching aluminium containers during the production process
- Creating models, holding devices and prototypes
- Carrying out preliminary tube repairs to large vacuum cleaning systems, and much more.



L mm	art.no.	☒	€	☒	€
180	742070 0001	1	13,75	12	9,40
9204					

## Hand lever-operated grease gun

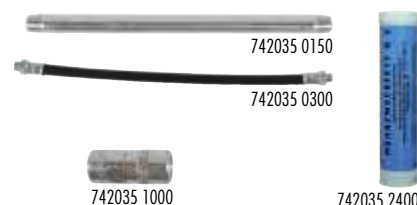
- Made of steel
- Safety handle
- Connection thread M10x1
- With TÜV/GS certification in accordance with DIN 1283



Description	art.no.	€
Hand-lever operated pressure grease gun without grease cartridge	742030 0001	18,15
Case set incl. lever press, reinforced rubber hose, angled nozzle pipe, 2x straight nozzle pipe, universal mouthpiece, tip mouthpiece	742030 1000	137,50
7125		

### Accessories

Description	art.no.	€
Nozzle pipe 150 mm, straight	742035 0150	2,19
High-pressure reinforced hose 10x300 mm (burst pressure 1000 bar)	742035 0300	8,90
Hydraulic mouthpiece	742035 1000	3,61
Grease cartridge 400 g	742035 2400	6,10
7125		



## Paper tissue rolls and cleaning cloths

- Unit prices when purchased in PU

Even more handy  
and absorbent

### Paper tissue rolls Multiclean®

- Suitable for industry and trade use (e.g. machine maintenance)

Description	Dimensions	L mm	Contents	D mm	☒	art.no.	€
2-ply	36 x 38cm	360	Approx. 1000 sheets per roll	290	2	<b>720596 0004</b>	<b>28,70</b>
3-ply	38 x 22cm	380	Approx. 1000 sheets per roll	390	1	720596 0003	29,50
3-ply	36 x 38cm	360	Approx. 1000 sheets per roll	390	1	720596 0005	39,60

7138



### Paper tissue rolls Multiclean® plus

- Very good grip, high-volume and even more absorbent

Description	Dimensions	L mm	Contents	D mm	☒	art.no.	€
3-ply	36 x 36cm	180	Approx. 500 sheets per roll	285	2	<b>720592 0004</b>	<b>25,10</b>

7138



### Floor stand with refuse sack holder (supplied without paper tissue roll)

- Suitable for paper tissue rolls up to 42 cm wide

Description	art.no.	€
Without paper tissue roll and refuse bag	<b>720593 0002</b>	<b>89,-</b>
with paper tissue roll 36 x 38 cm (360 m, 3-ply) and 120l refuse bag	720593 0010	127,-

7138



### Wall-mounted holder with refuse sack holder (supplied without paper tissue roll)

- Suitable for paper tissue rolls up to 42 cm wide

Description	art.no.	€
Without paper tissue roll and refuse bag	<b>720594 0002</b>	<b>63,60</b>

7138



### Refuse sack

Volume l	Contents	Colour	art.no.	€
120	1 roll of 15 bags	Blue	<b>720598 0001</b>	<b>6,95</b>

7138

### Cleaning cloths WiperBowl® Polytex®

- High cloth quality for individual use; double-sided, soft and abrasive
- Lifts dirt deposits including heavy grease, lubricant, adhesive, oil, tar and carbon.
- Suitable for almost all materials and surfaces in industrial and trade fields, for vehicle care as well as cleaning machine controls, computer keyboards, telephone receivers and even sensitive surfaces
- Particularly skin-friendly thanks to gentle cleaning substances with a pleasant, fresh orange scent
- Perforated sheets make cloths easy to remove

Description	Contents	Dimensions	art.no.	€
Cleaning cloths in dispenser bucket	72 sheets	25 x 25 cm	<b>720597 0001</b>	<b>21,60</b>

7138



## NOGA Deburring tools



### Deburring tools, model S blades

Model	Description	suitable blades	art.no.	€
E01000	Aluminium hexagonal handle with non-replaceable S 10 blade	-	<b>750101</b> 0008	<b>5,75</b>
E0 2000	Plastic hexagonal handle with 1x S 10 blade, blade mount 3.2 mm diameter	All blades Model S (3.2 mm)	750101 0009	<b>3,97</b>
RB 1000	Aluminium hexagonal handle with 1 blade S 10 blade mount 3.2 mm diameter	All blades Model S (3.2 mm)	750101 0012	<b>9,05</b>
NG 1003	Plastic handle NG-1 with blade S 10, S 20, S 35 (1 of each)	All blades Model S (3.2 mm)	750110 1003	<b>13,75</b>
NG 1005	Plastic handle NG-1 with blade S10, S20, S35, S101, S202 (1 of each)	All blades Model S (3.2 mm)	750110 1005	<b>17,20</b>
NG 3003	Plastic handle NG-3 with telescopic shank, 1 holder S with telescopic shank with blade S100, S20, S30 (1 of each)	All blades Model S (3.2 mm)	750110 3003	<b>17,90</b>

7143



### Deburring tools, model N blades

Model	Description	suitable blades	art.no.	€
TB 1000	Aluminium hexagonal handle with 1 blade N1 blade mount 2.6 mm diameter	All blades Model N (2.6 mm)	<b>750101</b> 1020	<b>7,45</b>
NG 2002	Plastic handle NG-2 with N1 and N2 blades (1 of each)	All blades Model N (2.6 mm)	750101 2002	<b>11,60</b>
NG 2004	Plastic handle NG-2 with N1, N2, N3, N6 blades (1 of each)	All blades Model N (2.6 mm)	750101 2004	<b>15,60</b>
NG 3002	Plastic handle NG-3, 1 x blade holder N with N1 and N2 blades (1 of each)	All blades Model N (2.6 mm)	750101 3002	<b>15,70</b>

7143



### Deburring tools, model N and S blades

Model	Description	suitable blades	art.no.	€
LB 1000	Uni plastic grip, extendible twin-blade holder SN 20-110 mm (N) or 20-94 mm (S), holding fixtures 2.6 mm and 3.2 mm, blades N1, N2 (1 of each)	All blades Model N (2.6 mm) and Model S (3.2 mm)	<b>750101</b> 1010	<b>16,20</b>

7143



### Rear-side deburring tools and countersinks

Model	Description	suitable blades	art.no.	€
RC 1000	Reverse deburring tool, aluminium handle with blade R1, range 3-5.5 mm, can be used for forwards and reverse work	R1	<b>750120</b> 1000	<b>39,90</b>
RC 2000	Rear-side deburring tool, aluminium handle with blade R2, range 5-10 mm, can be used for front and rear-side work	R2	750120 2000	<b>41,40</b>
RC 2200	Rear-side deburring tool, aluminium handle with blade R3, range 10-22 mm, can be used for front and rear-side work	R3	750120 2200	<b>47,50</b>
NG 3100	Plastic handle NG-3, 1x blade holder C, 1x countersink C20	All countersinks Model C	750101 3100	<b>35,-</b>

7143



Continued on next page &gt;&gt;&gt;





**Reverse deburring tool set**

Model	Description	suitable blades	art.no.	€
RC 3300	Reverse deburring tool set, aluminium handle comprising RC 1000, RC 2000, RC 2200	R1, R2, R3	<b>750505</b> 3300	<b>123,-</b>
7145				

**Deburring tools, ceramic blades**

Model	Description	suitable blades	art.no.	€
CR2000	Handle CERA-Cut CR2100 with blade CR2200, convex ceramic blade with very long service life, ideal for plastics and other soft materials	CR2200, CR2500	<b>750105</b> 2000	<b>33,50</b>
CR2300	Handle CERA-Cut CR2100 with blade CR2500, concave ceramic blade with very long service life, ideal for plastics and other soft materials	CR2200, CR2500	750105 2300	<b>34,-</b>
CR1100	Soft-grip handle with non-replaceable ceramic blade with extremely long service life, ideal for plastics and other soft materials		750105 1100	<b>42,-</b>
CR1500	Soft-grip handle with ceramic blade CR1550 with extremely long service life, ideal for plastics and other metals	CR1550	750105 1500	<b>29,70</b>
CR4100	Plastic handle for mini ceramic scraper blades (ceramic blade CR4500)	CR4500	750105 4101	<b>36,-</b>
7143				

**Deburring tools, scraper blades**

Model	Description	suitable blades	art.no.	€
SC1000	Uni handle with blade T 120, extendible blade can be locked in any position	T 120	<b>750105</b> 1005	<b>21,20</b>
NG3700	Handle NG-3, holder D with blade D 50	All D blades	750105 3700	<b>21,20</b>
NG3710	Handle NG-3, holder D with blade D 66 for deburring the rear side of crosswise boreholes with diameters from 4 mm	All D blades	750105 3710	<b>18,95</b>
SC8000	Aluminium hexagonal handle SC with blade T 80	T 80	750105 0001	<b>16,90</b>
SC1500	Aluminium hexagonal handle SC with blade T 120	T 120	750505 1500	<b>33,50</b>
7143				

**Special deburring tools**

Model	Description	suitable blades	art.no.	€
NG3200	Handle NG-3, holder L with blade L3 for range 1-8 mm	L3, L4, L5, L6, L7	<b>750107</b> 3200	<b>18,55</b>
DB 1000	Plastic handle with hand protection with 2 blades N 80	N 80, N 80 M42	750115 1001	<b>20,30</b>
7143				





## NOGA Scraper set YT2000

- Set consists of one D75 scraper, one T80 scraper and the new YT1000 handle
- Quick-release tool replacement
- Flexible clamping handle, fits any hand



Model	Contents	art.no.	€
YT200	Handle YT 1000 and blades 1x D75, 1x T80	<b>750505</b> 4000	<b>20,80</b>
7145			

## NOGA Handle YT1000

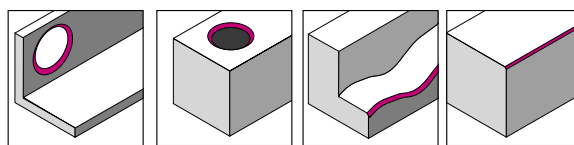
- For needle-point files, diamond files and scraper blades
- Quick-release tool replacement
- Flexible clamping handle, fits any hand
- Supplied without blades

Model	Clamp Ø mm	L mm	art.no.	€
YT 1000	2.2 to 4.5	90	<b>750501</b> 4000	<b>6,15</b>
7143				



## NOGA Deburring blades

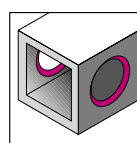
- 2.6 mm and 3.2 mm rotary blades
- Extensive range for quick and easy deburring
- extra blades for left-handed users on request



### N-blades, universal

Model	suitable for	Angle	Material	Hardness	Holding fixture Ø mm	Design	☒	art.no.	€
N1	Steel, aluminium, plastics	40	HSS M2	63Rc	2.6	Right-hand cutting edge	10	<b>751001</b> 0001	<b>1,55</b>
N1 TiN	Abrasive plastics	40	HSS M2 TiN	63Rc	2.6	Right-hand cutting edge	10	751001 1001	<b>2,94</b>
N1 (left-hand)	Steel, aluminium, plastics	40	HSS M2	63Rc	2.6	Left-hand cutting edge	10	751001 0010	<b>2,90</b>
N1C	Hardened steel, special plastic	50	Solid carbide	1400-1700HV	2.6	Right-hand cutting edge	1	751001 3001	<b>7,50</b>
N1D	Glass, ceramics	-	Diamond	1400-1700HV	2.6	Right-hand cutting edge	1	751001 2001	<b>14,60</b>
N10	Plastic, harder materials	45	HSS M35	65Rc	2.6	Right-hand cutting edge	10	751001 0070	<b>2,42</b>
N2	Brass, cast iron	80	HSS M2	63Rc	2.6	Left-hand cutting edge	10	751001 0020	<b>1,55</b>
N2 TiN	Stainless steel	80	HSS M2 TiN	63Rc	2.6	Left-hand cutting edge	10	751001 1020	<b>2,94</b>
N2C	Hardened steel, special plastic	80	Solid carbide	1400-1700HV	2.6	Right-hand/left-hand cutting edge	1	751001 3020	<b>7,50</b>

7144



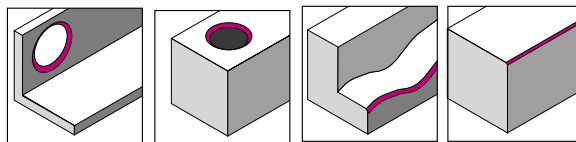
### N-blades, reverse deburring tool

Model	suitable for	Angle	Material	Hardness	Holding fixture Ø mm	Design	☒	art.no.	€
N3	Internal and external deburring, steel, aluminium	50	HSS M2	63Rc	2.6	Right-hand cutting edge	10	<b>751001</b> 0030	<b>1,90</b>
N6	Rear side of workpieces, steel, aluminium	40	HSS M2	63Rc	2.6	Right-hand cutting edge	10	751001 0060	<b>5,65</b>

7144



Continued on next page &gt;&gt;&gt;

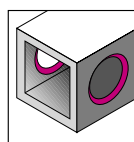


**S-blades, universal**

Model	suitable for	Holding fixture Ø mm	Angle °	Material	Hardness	Design	☒	art.no.	€
S10	Steel, aluminium, plastics	3.2	40	HSS M2	63Rc	Right-hand cutting edge	10	<b>751005 0001</b>	<b>1,79</b>
S10 TiN	Abrasive plastics	3.2	40	HSS M2 TiN	63Rc	Right-hand cutting edge	10	751005 1001	<b>3,45</b>
S10 (left-hand)	Steel, aluminium, plastics	3.2	40	HSS M2	63Rc	Left-hand cutting edge	10	751005 0010	<b>3,05</b>
S10C	Hardened steel, special plastic	3.2	50	Solid carbide	1400-1700HV	Right-hand cutting edge	1	751005 0005	<b>7,40</b>
S10D	Glass, ceramics	3.2	-	Diamond	1400-1700HV	Right-hand cutting edge	1	751005 2001	<b>17,90</b>
BS9110	Steel, aluminium, plastics	3.2	40	HSS	63Rc	Right-hand blade, with plastic cap	10	751005 9110	<b>9,15</b>
S100	Plastic, harder materials	3.2	78	HSS M35	65Rc	Right-hand cutting edge	10	751005 0100	<b>1,85</b>
S100 TiN	Plastic, harder materials	3.2	78	HSS M35 TiN	65Rc	Right-hand cutting edge	10	751005 1100	<b>4,26</b>
S20	Brass, grey cast iron	3.2	60	HSS M2	63Rc	Left-hand cutting edge	10	751005 0020	<b>1,79</b>
S20 TiN	Stainless steel	3.2	60	HSS M2 TiN	63Rc	Left-hand cutting edge	10	751005 1020	<b>4,26</b>
S20C	Hardened steel, special plastic	3.2	80	Solid carbide	1400-1700HV	Right-hand/left-hand cutting edge	1	751005 0025	<b>7,40</b>
S35	Straight edges, all materials	3.2	55	HSS M2	63Rc	Right-hand/left-hand cutting edge	10	751005 0035	<b>1,79</b>
S101	Fine edges, all materials	3.2	40	HSS M2	63Rc	Right-hand cutting edge	10	751005 0101	<b>1,79</b>
S101 TiN	Fine edges, all materials	3.2	40	HSS M2 TiN	63Rc	Right-hand cutting edge	10	751005 1010	<b>3,45</b>
S101 (left-hand)	Fine edges, all materials	3.2	40	HSS M2	63Rc	Left-hand cutting edge	10	751005 0110	<b>3,05</b>
S150	Bores < Ø 1.5 mm	3.2	45	HSS M2	63Rc	Right-hand cutting edge	10	751005 0150	<b>1,79</b>
S150 TiN	Bores < Ø 1.5 mm	3.2	45	HSS M2 TiN	63Rc	Right-hand cutting edge	10	751005 1050	<b>4,26</b>
S202	Brass, grey cast iron	3.2	55	HSS M2	63Rc	Left-hand cutting edge	10	751005 0202	<b>1,85</b>
S202 TiN	Brass, grey cast iron	3.2	55	HSS M2 TiN	63Rc	Left-hand cutting edge	10	751005 1202	<b>4,26</b>

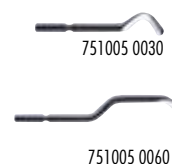


7144

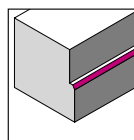


**S-blades, reverse deburring tool**

Model	suitable for	Angle °	Material	Hardness	Holding fixture Ø mm	Design	☒	art.no.	€
S30	Internal and external deburring, steel, aluminium	40	HSS M2	63Rc	3.2	Right-hand cutting edge	10	<b>751005 0030</b>	<b>1,79</b>
S60	Rear side of workpieces, steel, aluminium	40	HSS M2	63Rc	3.2	Right-hand cutting edge	10	751005 0060	<b>6,15</b>



7144



**S-blades, step deburring tool**

Model	suitable for	Angle °	Material	Hardness	Holding fixture Ø mm	Design	☒	art.no.	€
S80	Shallow steps	35	HSS M2	63Rc	3.2	Right-hand cutting edge	10	<b>751005 0080</b>	<b>3,03</b>
S80 TiN	Shallow steps	35	HSS M2 TiN	63Rc	3.2	Right-hand cutting edge	10	751005 1080	<b>5,45</b>



7144

**Blade set**

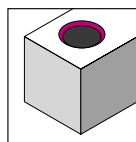
suitable for	Description	Model	art.no.	€
For steel, aluminium, plastics, brass and cast iron	S10, S20, S30, S35, S60, S70, S100C, S101, S150, S202 blade (1 of each)	BS9999	<b>750505 9999</b>	<b>28,50</b>

7145



## VNOGA Countersinking bits

- HSS
- 90° countersink angle



### Deburring heads

Model	Holding fixture Ø mm	Diameter range mm	Material	Hardness	art.no.	€
C12	M7	1 - 12	HSS M2	63Rc	<b>751020 0012</b>	<b>18,95</b>
C20	M7	1 - 20	HSS M2	63Rc	751020 0020	<b>26,50</b>
C30	M7	1 - 30	HSS M2	63Rc	751020 0030	<b>39,20</b>
RD3,2	3.2	0 - 3	HSS M2	63Rc	751020 0032	<b>13,55</b>
RD6,3	3.2	1 - 6.3	HSS M2	63Rc	751020 1063	<b>17,20</b>
RD8,3	3.2	1 - 8.3	HSS M2	63Rc	751020 1083	<b>17,40</b>
RD10,4	3.2	1 - 10.4	HSS M2	63Rc	751020 1105	<b>17,70</b>
RD16,5	3.2	1 - 16.5	HSS M2	63Rc	751020 1650	<b>23,-</b>
RD20	3.2	1 - 20	HSS M2	63Rc	751020 2201	<b>34,20</b>

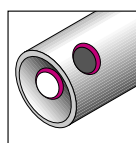
7144



### Blades for internal and external hole machining

Model	Holding fixture Ø mm	Diameter range mm	Material	Hardness	art.no.	€
R1	-	3 - 5.5	HSS M2	63Rc	<b>751025 0001</b>	<b>11,85</b>
R2	-	5 - 10	HSS M2	63Rc	751025 0002	<b>13,65</b>
R3	-	10 - 22	HSS M2	63Rc	751025 0003	<b>22,10</b>

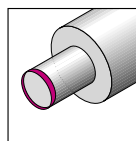
7144



### Exterior deburring

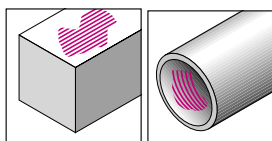
Model	Holding fixture Ø mm	Diameter range mm	Material	Hardness	art.no.	€
RDE18	3.2	4 - 18	HSS M2	63Rc	<b>751020 0100</b>	<b>16,30</b>

7144



## VNOGA Scraper blades

- Wide range of applications
- Quick and easy to use



### Scraper blades for surfaces

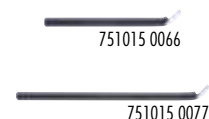
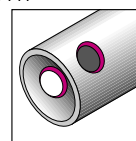
Model	Holding fixture Ø mm	Ø mm	L mm	Angle °	Material	Hardness	art.no.	€
D50	3.2	2.5	50	60	HSS M2	63Rc	<b>751015 0050</b>	<b>8,40</b>
D55	3.2	2.5	50	60	Solid carbide	1400-1700HV	751015 0055	<b>21,60</b>
D75	3.2	2.5	75	60	HSS M2	63Rc	751015 0075	<b>9,40</b>
T80	-	4.2	80	60	115 Cr V3	63Rc	751015 0080	<b>9,15</b>
T120	-	7.4	120	60	115 Cr V3	63Rc	751015 0120	<b>17,55</b>
D50TIN	3.2	2.5	50	60	HSS M2	63Rc	751015 5012	<b>14,20</b>

7144

### Scraper blades for reverse deburring

Model	Holding fixture Ø mm	Ø mm	L mm	Angle °	Material	Hardness	art.no.	€
D66	3.2	2.7	50	50	HSS M2	63Rc	<b>751015 0066</b>	<b>6,60</b>
D77	3.2	2.7	75	50	HSS M2	63Rc	751015 0077	<b>9,40</b>

7144



## WNOGA Blade holder

Model	Description	L mm	suitable blades	art.no.	€
EL02003	Holder S, extendible 30-115 mm, suitable for handle NG-3	131	All blades Model S (Ø 3.2 mm)	<b>750501 2002</b>	<b>9,70</b>
EL01033	Holder N, extendible 25-115 mm, suitable for handle NG-3	131	All blades Model N (Ø 2.6 mm)	750501 2003	<b>9,70</b>
CH3000	Holder C, with external thread M7 for holding countersinks, suitable for handle NG-3	131	Countersink C12, C20, C30	750501 2004	<b>7,80</b>
EL06023	Holder T, suitable for handle NG-3	131	Scrapers T 50, T 70	750501 2005	<b>7,80</b>
EL05003	Holder D, with clamping screw M3 and clamping key, suitable for handle NG-3	131	Scrapers D 50, D 66	750501 2006	<b>6,60</b>
EL04003	Holder K, with clamping screw M3, suitable for handle NG-3	135	All blades Model K	750501 2007	<b>8,25</b>
EL07013	Holder L, with square mount 3 mm and clamping screw 4 mm, suitable for handle NG-3	131	All blades Model L	750501 2008	<b>8,25</b>
SN1000	Holder SN with double-ended extendible blade mount 2.6 and 3.2 mm, suitable for UNI handle	145 x Ø 7	All blades Model S and N	750501 2001	<b>10,90</b>

7143



## WNOGA Handles

Model	Description	Dimensions	suitable blades	art.no.	€
NG 1000	Handle NG-1 with spare compartment in cap	-	All blades Model S (Ø 3.2 mm)	<b>750501 3010</b>	<b>8,65</b>
NG 2000	Handle NG-2 with spare compartment in cap	-	All blades Model N (Ø 2.6 mm)	750501 3020	<b>8,65</b>
NG 3000	Handle NG-3 with spare compartment in cap	-	All holders (not SN 1000)	750501 3030	<b>8,65</b>
UH1000	UNI handle, universal plastic handle	130 x 26	Holder SN, as well as blades T120	750501 1010	<b>8,25</b>
RB1600	RG-handle, hexagonal, aluminium	130 x 12	S-blades, Ø 3.2 mm	750501 1600	<b>9,90</b>
SC1300	SC-handle	120 x 12	Scraping tools D50, D55, D66, D75, D77, T80	750501 1300	<b>13,-</b>
PV1000	Solid aluminium handle with 3-jaw chuck	-	All tools, blades and holders 0.8-8 mm	750501 1020	<b>29,-</b>

7143



Non-rebound ...



... it's the tool.

**ATORN**<sup>®</sup>  
Performance demands quality

## NOGA Deburring tool set in a hand-held fold-out holder

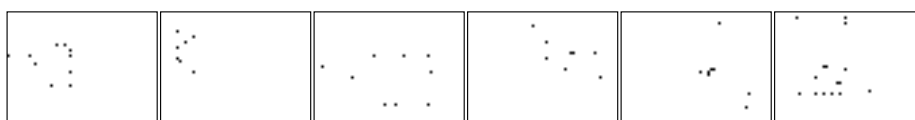
- 4 in 1 system
- Ideally suitable for steel, aluminium and plastics



Description	art.no.	€
1 S10 deburring tool, 1 D50 scraper, 1 N2 deburring tool, 1 90° countersink for 1-10.4 mm	<b>750510 1000</b>	<b>68,10</b>
	7143	

## NOGA NOGA 007 universal deburring tool set

- Set for deburring and countersinking work
- Thread cleaning and deburring for female threads from Ø 9 mm
- Deburring O-ring recesses from Ø 3 mm
- Countersinking up to Ø 16.5 mm
- External deburring from Ø 4 mm to Ø 18 mm
- Deburring small profiles and bores from Ø 1.5 mm
- Deburring particularly hard materials



Model	Description	art.no.	€
SP1007	RB handle, aluminium, blade OR, RD 16, 5, RDE18, TC, S100, S150 (1 of each)	<b>750505 0007</b>	<b>53,80</b>
		7145	



## NOGA Mini hand-held deburring tool set

- Ideal for tool and mould makers
- For very fine work
- Blades are **not** replaceable

### Set

Model	Contents	art.no.	€
FT3000	1 mini deburring tool, 1 mini scraper, 1 mini countersink	<b>750506 3000</b>	<b>34,40</b>
		7144	

### Spare blades

Description	art.no.	€
Mini deburring tool	<b>750506 1000</b>	<b>7,55</b>
Mini scraper	750506 1100	<b>15,10</b>
Mini countersink	750506 1200	<b>12,25</b>
	7144	



## NOGA Universal hand-held deburring tool set

- **4 pcs.**
- Hand-held deburring tools, colour-coded and fitted with different blades
- For machining **steel, brass, aluminium, plastic**



Model	Description	art.no.	€
EO 2100	4 EO handles, black, colour-coded, blade S10, S20, S100, S150 (1 of each)	<b>750505 0004</b>	<b>19,05</b>
		7145	





## WNOGA Hand-held deburring tool sets

### In a blister pack

Model	Description	suitable for	art.no.	€
NG8000	NG-2 handle, 10 blades N1	For steel, aluminium and plastics	<b>750505 8000</b>	<b>21,20</b>
NG8050	NG-2 handle, 20 blades N1	For steel, aluminium and plastics	750505 8050	<b>33,50</b>
NG8100	NG-2 handle, 20 blades N10	For plastics and hard materials	750505 8100	<b>30,30</b>
NG8150	NG-1 handle, 10 blades S10	For steel, aluminium and plastics	750505 8150	<b>20,20</b>
NG8200	NG-1 handle, 20 blades S10	For steel, aluminium and plastics	750505 8200	<b>31,10</b>
NG8250	NG-1 handle, 20 blades S100	For plastics and hard materials	750505 8250	<b>42,50</b>
NG8300	NG-3 handle, 1 holder N, 5 blades N1 5 blades N2	For steel, aluminium, plastics, brass and cast iron	750505 8300	<b>24,50</b>
NG8350	NG-3 handle, 1 holder S, 5 blades S10, 5 blades S20	For steel, aluminium, plastics, brass and cast iron	750505 8350	<b>26,-</b>

7145

### Hand-held deburring tool sets

Model	Dimensions	Description	Contents	art.no.	€
NG9200	251 x 120 x 40	Deburring tool range "Bronze" 13-pcs.	1 NG-3-handle 1 holder N, 1 holder S 1 holder C 1 countersink insert C20 1 holder D 1 scraper-blade D50 1 of each blade N1, N2, S10, S20, S30, S150	<b>751510 9200</b>	<b>76,50</b>
NG9300	251 x 120 x 40	Deburring tool range "Silver" 11-pcs.	1 NG-3 handle 1 holder S 1 reverse deburring tool RC 2000 1 plastic six-sided grip holder diameter 3.2 mm per 1 RotoDrive RD 3.2 mm, 10.4 mm, 16.5 mm 1 external RotoDrive 18.0 mm 1 of each blade S10, S20, S30	751510 9300	<b>110,-</b>
NG9400	270 x 230 x 50	Deburring tool range "Gold" 20-pcs.	1 NG-3 handle 1 aluminium hexagonal handle SC 1300 1 plastic hexagonal handle mount diameter 3.2 mm 1 of each holder S 1 holder N 1 holder C 1 countersink insert C20 1 holder D 1 scraper blade D50 1 holder K 1 blade N80K 1 of each blade N1, N2, S10, S20, S30, S150, D66 RD10.4 1 hexagonal offset screwdriver 1.5 mm	751510 9400	<b>121,-</b>
NG9500	270 x 230 x 50	Platinum deburring tool set 25-pcs.	1 hand-held deburring tool DB 1000 1 NG-1 handle 1 NG-3 handle 1 aluminium hexagonal handle TB 1000 1 holder S 1 holder N 1 holder K 1 blade N80K 1 holder D 1 scraper blade D66 1 holder C 1 countersink insert C20 1 holder T 1 scraper blade T70 1 RotoDrive RD 10.4 mm 1 external RotoDrive 18.0 mm 1 of each blade N1, N2, S10, S20, S30, S150 1 hexagonal offset screwdriver 1.5 mm	751510 9500	<b>192,50</b>
SP7700	270 x 230 x 50	Deburring tool set "TOP7" 7-pcs.	1 NG3100 1 NG3700 1 NG3200 1 SC8000 1 NG3300 1 NG3710 1 NG3003	751510 7700	<b>132,50</b>

7145





## VARTA Batteries

- High-quality branded long-life alkaline batteries
- Price per pack

### Batteries

Designation	Tension V	Type	Contents	art.no.	€
LR03, Micro, AAA	1,5	Alkaline / High Energy	PU=4 units	<b>548079 4003</b>	<b>6,65</b>
LR6, Mignon, AA	1,5	Alkaline / High Energy	PU=4 units	548079 4006	<b>6,65</b>
LR14, Baby	1,5	Alkaline / High Energy	PU=2 units	548079 4014	<b>6,65</b>
LR20, Mono, D	1,5	Alkaline / High Energy	PU=2 units	548079 4020	<b>6,65</b>
6LR61, 9 V block	9,0	Alkaline / High Energy	PU=1 unit	548079 4022	<b>6,65</b>
					5125



### Longlife / Power rechargeable batteries

Designation	Tension V	Type	Contents	art.no.	€
LR3, Micro battery, AAA	1.2	Longlife battery	PU=2 units	<b>548079 7001</b>	<b>7,85</b>
LR6, Mignon battery, AA	1.2	Longlife battery	PU=2 units	548079 7002	<b>7,85</b>
LR14, Baby battery, C	1.2	Power battery	PU=2 units	548079 7103	<b>15,70</b>
LR20, Mono battery, D	1.2	Power battery	PU=2 units	548079 7104	<b>15,70</b>
6LR61, 9 V block battery, E	8.4	Power battery	PU=1 unit	548079 7105	<b>13,55</b>
					5125



### Button batteries / special batteries

Designation	Tension V	Type	Contents	art.no.	€
Button battery 13ZL	1.4	Zinc-air	PU=6 units	<b>548079 4606</b>	<b>8,65</b>
Button battery 10GA	1.5	Alkaline / High Energy	PU=1 unit	548079 4706	<b>3,45</b>
Button battery CR2032	3.0	Lithium	PU=1 unit	548079 6032	<b>5,10</b>
Button battery CR2450	3.0	Lithium	PU=1 unit	548079 6450	<b>5,10</b>
Button battery SR 44, 357	1.55	Silver oxide	PU=1 unit	500534 0001	<b>4,34</b>
23A	12	Alkaline / Electronic	PU=1 unit	548079 4223	<b>5,10</b>
LR1, Lady	1.5	Alkaline / Electronic	PU=1 unit	548079 4001	<b>2,26</b>
CR123A	3.0	Lithium	PU=1 unit	548079 6205	<b>7,95</b>
					5125



## ATORN® Professional fold-out light

- Latest LED technology
- Robust and splash-proof plastic housing with rubber-coated gripping surface
- With residual capacity and charge control display
- Various lighting modes
- Main light 280 lumen and additional light 180 lumen
- **Accessories:** incl. micro USB charging cable 1.5 m and USB AC charging adapter



L mm	Weight kg	art.no.	€
131	183	<b>774003 0013</b>	<b>52,90</b>

7150



## ATORN® Professional workshop light

- Latest LED technology
- Robust and splash-proof plastic housing with rubber-coated gripping surface
- Attachment hooks can be removed and rotated 360°
- Belt clip and magnetic holder on the underside
- Various lighting modes
- Main light 105 lumen
- **Accessories:** incl. micro USB charging cable 1.5 m and USB AC charging adapter



L mm	Weight kg	art.no.	€
266	340	774003 0012	60,10
7150			



## ATORN® LED workplace light

### LED workplace light

- The light is completely water-proof and in combination with the flexible swan neck allows accurate working at any given place. Even inside machinery and in hard-to-reach spots, work surfaces can be perfectly illuminated.
- Lamp head and housing constructed from robust anodised aluminium, flexible light holder hose constructed from metal with rubber sheathing
- **Protection class IP67**
- Resistant to water, oil, coolant and cutting fluid, as well as cleaning agents
- Colour temperature approx. 5,500K (cool white)
- Beam angle approx. 38°
- **Energy Efficiency Class A+**
- **Connection types:** Direct connection to the machine (24V) or all conventional supply voltages (110V-240V)
- **Supplied with:** complete with branded high-performance LED, screw clamp and screws for direct attachment to machine, table or wall

Arm length mm	Output W	Tension V	Luminous flux lm	art.no.	€
420	10	230	ca. 1000	774008 0001	316,-
420	10	24	ca. 1000	774008 0002	311,-
7175					



NEW

## ATORN® LED light strips

### LED light strip

- Additional lighting on or in machinery, on work benches, in cupboards, on shelves or simply on the wall.
- Light housing manufactured from anodised aluminium
- **Protection class IP67**
- Resistant to water, oil, coolant and cutting fluid, as well as cleaning agents
- Colour temperature approx. 5500K (cool white)
- Beam angle approx. 140°
- **Energy Efficiency Class A+**
- **Connection types:** direct connection to the machine (24V) or with power supply (230V)

L mm	Output W	Tension V	Luminous flux lm	art.no.	€
330	14.4	230	1900	774009 0001	316,-
330	14.4	24	1900	774009 0002	305,-
630	28.8	230	3800	774009 0003	440,-
630	28.8	24	3800	774009 0004	405,-
7175					



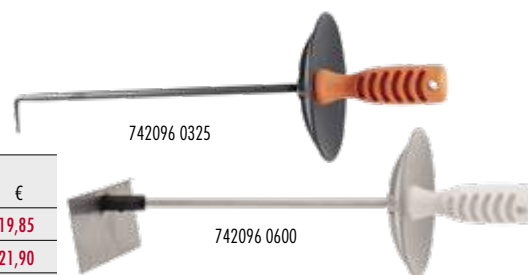
NEW

## SARA® Chip hooks

- The affordable alternative
- Robust chip protection shield
- Optional chip scraper

Description	Contents	art.no.	€
Chip hook 325 mm	1 unit	<b>742096 0325</b>	<b>19,85</b>
Chip hook 525 mm	1 unit	742096 0525	21,90
Chip scraper width 120 mm, height 65 mm	2 units	742096 0600	15,40

7123



## SARA® Chip collector

### Magnetic chip collector

- For the removal of magnetic chips and small parts
- Integrated permanent magnet
- Remove chips by pulling the handle out of the permanent magnet
- Shield at handle end to prevent injuries
- Automatic material separation
- Low weight: 554 g
- Magnet traction: 19.3 kg



D mm	L mm	art.no.	€
25	360 - 675	<b>742095 0001</b>	<b>40,60</b>

7123

## ATORN® Magnetic chip broom

NEW

- **For practical cleaning of floors in various working areas**
- Easy removal of any metal parts which are picked up thanks to the release mechanism on the handle
- Absorption capacity up to 9 kg
- Adjustable telescopic handle with length from 750 to 1050 mm
- Smooth-running plastic wheels



Width mm	L mm	art.no.	€
400	1050	<b>742098 0001</b>	<b>114,-</b>

7101



Over 200,000 tools available online!

Register online now!

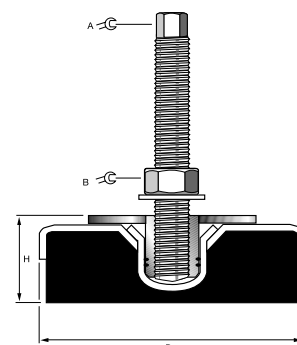
[www.saratools.com](http://www.saratools.com)



## ☀️ SUNNEX Machine shoes OSM

### Compensation/vibration damping

- For loads of up to 5,500 kg per machine shoe
- Outstanding compensation properties
- Efficient vibration damping
- Reduction in disturbing direct noise
- Pressure plate with fine-pitch thread, adjusted using integrated compensation screws
- Steel casing, rubber damping element, resistant to most types of grease, acid, oil and coolant
- Particularly suitable for machine tools, presses, stamping and embossing machines, injection moulding machines



Model	Load area daN	Injection moulding mach. <100 cycles/hr. daN	Presses, up to 125 strikes/min. daN	Presses, 125-160 strikes/min. daN	Presses, 160-200 strikes/min. daN	A wr. width mm	B wr. Width mm	D mm	H mm	Adjustment screw mm	Galvanised art.no.	€
OSM 1	50 - 500	50 - 200	70 - 200	60 - 140	50 - 120	9	19	80	38 - 50	M12 x 1.25 x 120	775010 0080	31,60
OSM 2	400 - 1,000	200 - 400	200 - 400	120 - 350	100 - 250	12	24	120	46 - 59	M16 x 1.5 x 120	775010 0120	54,50
OSM 3	800 - 2,000	400 - 1,000	400 - 1,400	350 - 1,100	250 - 725	15	30	160	53 - 68	M20 x 1.5 x 170	775010 0160	72,80
OSM 4	1,500 - 4,000	1,500 - 2,500	1,700 - 2,800	1,000 - 2,100	800 - 1,400	15	30	160	54 - 69	M20 x 1.5 x 170	775010 1030	121,50
OSM 5	3,000 - 5,500	2,000 - 3,800	3,000 - 4,000	2,000 - 3,500	1,400 - 2,400	15	30	200	56 - 71	M20 x 1.5 x 170	775010 1040	181,50

7153

### Accessories and spare parts

Designation	suitable for model	art.no.	€
Standard screw, M12 x 1.25 x 120	OSM 1	775020 0001	4,23
Standard screw, M16 x 1.5 x 120	OSM 2	775020 0002	8,90
Standard screw, M20 x 1.5 x 170	OSM 3, 4, 5	775020 0003	12,30
Extended screw, M12 x 1.25 x 210	OSM 1	775020 1001	12,75
Extended screw, M16 x 1.5 x 210	OSM 2	775020 1002	15,60
Extended screw, M20 x 1.5 x 210	OSM 3, 4, 5	775020 1003	19,75
Washer	OSM 1	775020 2001	1,01
Washer	OSM 2	775020 2002	1,01
Washer	OSM 3, 4, 5	775020 2003	1,01
Nut M12 x 1.25	OSM 1	775020 3001	1,01
Nut M16 x 1.5	OSM 2	775020 3002	1,48
Nut M20 x 1.5	OSM 3, 4, 5	775020 3003	1,23

7153



## Machine shoes

Suitable for setting up tool, printing, plastic, textile and many other machines in all industries.

**90%** of all set-up problems with machines and related power units can be resolved with SUNNEX machine shoes. Eliminates up to 85% of vibrations, impacts and noise.

### Advantages:

- Low cost
- No need to create foundations
- Production can commence immediately after delivery and fitting
- Retrofitting your machine fleet can be done quickly

### Selection of machine shoes:

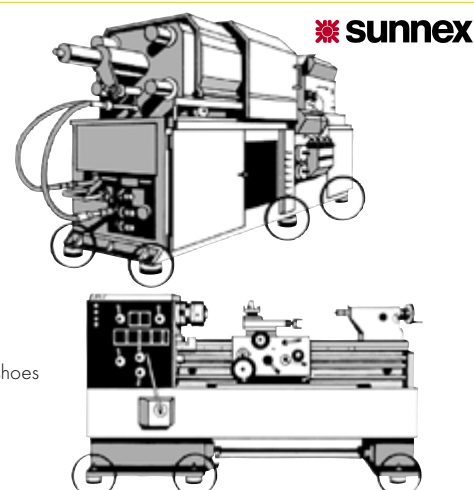
In order to select the correct SUNNEX machine shoe sizes, certain information is needed:

- Machine weight
- Number of supported surfaces for the machine shoes
- Supported load per machine shoe

Calculation:

Machine weight \_\_\_\_\_ = Size of the machine shoes  
Number of supported surfaces

(within the threshold range, the smaller of the possible sizes must be used!)

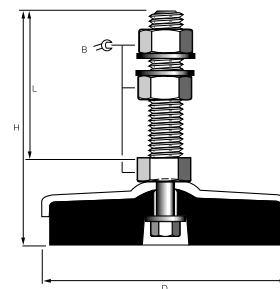


## ☀️ sunnex Machine shoes AM

### • Compensation/vibration damping

- For loads of up to 2,000 kg per machine shoe
- Stainless steel version also available for particularly demanding applications
- Articulated screw for inclined contact surfaces
- For damping light and medium-heavy machines
- Stainless steel version particularly suitable for humid, wet or corrosive environments with particularly high hygiene requirements
- Galvanised version for less challenging environments
- Integrated compensation screw
- Pitch adjustable by seven degrees
- Particularly suitable for the foodstuffs industry, process engineering, conveyor tracks, smaller workshop machines

Model	Load area kg	D mm	L mm	H mm	Adjustment screw mm	B mm	Stainless steel		Galvanised	
							art.no.	€	art.no.	€
AM 21	50 - 150	68	100	125	M10 x 1.5	17	775040 0001	45,20	775050 0001	26,30
AM 21	50 - 150	68	120	146	M12 x 1.75	19	775040 1001	49,-	775050 1001	26,90
AM 21	50 - 150	68	120	148	M16 x 2.0	24	775040 2001	58,50	775050 2001	34,-
AM 21	50 - 150	68	120	151	M20 x 2.5	30	775040 3001	75,80	775050 3001	36,10
AM 22	100 - 250	68	100	125	M10 x 1.5	17	775040 0002	48,-	775050 0002	28,50
AM 22	100 - 250	68	120	146	M12 x 1.75	19	775040 1002	49,-	775050 1002	27,20
AM 22	100 - 250	68	120	148	M16 x 2.0	24	775040 2002	60,10	775050 2002	34,-
AM 22	100 - 250	68	120	151	M20 x 2.5	30	775040 3002	78,90	775050 3002	38,10
AM 31	50 - 500	98	120	158	M12 x 1.75	19	775040 4001	64,10	775050 4001	43,50
AM 31	50 - 500	98	120	158	M16 x 2.0	24	775040 5001	72,80	775050 5001	45,90
AM 31	50 - 500	98	120	158	M20 x 2.5	30	775040 6001	86,50	775050 6001	50,-
AM 31	50 - 500	98	150	191	M24 x 3.0	36	775040 7001	122,50	775050 7001	64,60
AM 32	450 - 1,000	98	120	158	M12 x 1.75	19	775040 4002	65,10	775050 4002	45,90
AM 32	450 - 1,000	98	120	158	M16 x 2.0	24	775040 5002	75,30	775050 5002	49,-
AM 32	450 - 1,000	98	120	158	M20 x 2.5	30	775040 6002	89,-	775050 6002	52,40
AM 32	450 - 1,000	98	150	191	M24 x 3.0	36	775040 7002	122,50	775050 7002	67,20
AM 41	900 - 1,500	140	120	169	M12 x 1.75	19	775040 0003	98,70	775050 0003	61,10
AM 41	900 - 1,500	140	120	169	M16 x 2.0	24	775040 1003	107,-	775050 1003	64,10
AM 41	900 - 1,500	140	120	169	M20 x 2.5	30	775040 2003	120,50	775050 2003	67,20
AM 41	900 - 1,500	140	150	202	M24 x 3.0	36			775050 3003	80,90
AM 42	1,400 - 2,000	140	120	169	M12 x 1.75	19	775040 0004	103,-	775050 0004	64,10
AM 42	1,400 - 2,000	140	120	169	M16 x 2.0	24	775040 1004	110,-	775050 1004	66,70
AM 42	1,400 - 2,000	140	120	169	M20 x 2.5	30	775040 2004	123,50	775050 2004	70,20
AM 42	1,400 - 2,000	140	150	202	M24 x 3.0	36	775040 3004	153,-	775050 3004	83,40
							7154		7154	



## ☀️ sunnex Machine shoes CM

### • Vibration damping

- For loads of up to 2,000 kg per machine shoe
- For machines with integrated adjustment screws
- Very low height
- Stainless steel version also available on request
- Pressure plate made from galvanised sheet steel, base element made from high-strength rubber
- Very low height
- Extremely cost-effective
- Particularly suitable for workshop machinery, scales, slim machines and equipment

Model	Load area kg	D mm	H mm	art.no.	€
CM 80	50 - 500	80	20	775060 0080	15,70
CM 120	400 - 1000	120	24	775060 0120	34,30
CM 160	800 - 2000	160	29	775060 0160	52,40

7154





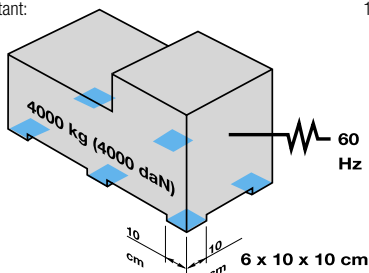
## ☀️ sunnex Damping mat SP

- Five different damping classes
- Efficient impact/vibration damping
- Reduces the transmission of machine noise
- Reduces the tendency of machines to "wander"
- For a wide range of industrial applications
- Five different versions with varying hardness, natural frequencies and load bearing capacities
- Specially developed nitrile rubber, resistant to most types of grease, acid, oil and coolant
- Can be cut to size



### Calculation

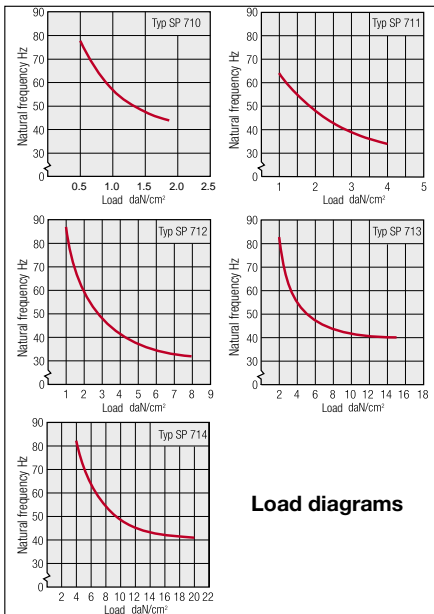
Example:  
 Machine weight: 4,000 kg  
 Interference frequency: 60 Hz  
 Circulation: 10 x 10 cm / SP unit  
 Number of surfaces: 6  
 Constant: 1.5



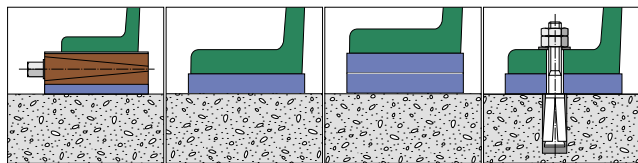
### Surface load / plate:

$$\frac{\text{Weight}}{\text{Total surface}} = \frac{4000}{6 \times 10 \times 10} = 6.67 \text{ daN/cm}^2$$

Max. natural frequency of the MP unit:  
 $\frac{\text{Interference frequency}}{1.5} = \frac{60}{1.5} = 40 \text{ Hz}$



Load diagrams



Model	Load area	Colour	Dimensions L x W x H mm	art.no.	€
SP 710	0.5 - 1.75	Black	450 x 450 x 8	775501 0710	88,-
SP 711	1.0 - 4.0	Black	450 x 450 x 8	775501 0711	88,-
SP 712	1.0 - 8.0	Black	450 x 450 x 8	775501 0712	94,60
SP 713	2.0 - 15.0	Black	450 x 450 x 13	775501 0713	125,50
SP 714	8.0 - 20.0	Green	450 x 450 x 13	775501 0714	122,50

7154





## SARA® Pneumatic engraver

- Suitable for engraving work on steel and non-ferrous metals
- For marking or for reworking older engravings
- With flexible 1.4 m supply hose for unrestricted work
- Mini engraver function allows needle to be used with precision
- Robust stainless steel casing fits comfortably in the hand and prevents fatigue
- Supplied with 1/4" BSPT air connection and plug nipple
- Also suitable for humid environments
- **Supplied with:** Pneumatic engraver, engraving needle Ø 0.05 - 0.10 mm

### Pneumatic engraver

L mm	Height mm	blows	Working pressure bar	Air consumption l/min	Holding fixture Ø mm	Lift mm	Weight kg	Noise level dB	art.no.	€
160	16	34,000	6.2	4	3.2	0.05	0.2	61.5	<b>777025 0001</b>	<b>192,50</b>
										7160



### Engraving needle

Description	art.no.	€
Ø 0.05 - 0.10 mm	<b>777025 0510</b>	<b>47,50</b>
Ø 0.10 - 0.20 mm	777025 1020	47,50
Ø 0.20 - 0.30 mm	777025 2030	47,50
		7160

## SARA® Pneumatic precision die grinder

- Extremely high speed of 54,000 rpm, ideal for industrial applications or for finishing engines/carburetors (fine-tuning)
- Switched on and off by rotary switch.
- Air supply and exhaust hose reduces exhaust air noise and directs exhaust air away from the body
- Air connection, 1/4 inch IT
- Supplied with 3 mm collet and spanners for disassembly

### Pneumatic precision mini die grinder

L mm	Height mm	max. speed r/min	Output W	Working pressure bar	Collet Ø mm	Weight kg	Noise level dB	Air consumption l/min	art.no.	€
134	15	54000	155	6.2	3.0	0.2	74	135	<b>777001 0001</b>	<b>270,-</b>
										7160

### Accessories

Description	art.no.	€
Collet Ø 3 mm	<b>777002 0030</b>	<b>30,30</b>
		7160



## SARA® Pneumatic die grinder

- Powerful die grinder with exhaust hose to reduce noise emission
- Robust design with low power/weight ratio for professional applications
- Infinitely variable rotational speed control
- Safety lever to prevent accidental switch-on
- Cold insulation on the handle
- With high-quality angular gear

**NEW**


L mm	Height mm	max. speed r/min	Output W	Working pressure bar	Air consumption l/min	Collet Ø mm	Weight kg	Noise level dB	art.no.	€
185	70	22,000	650	6.2	380	6	0.8	81	<b>777027 0030</b>	<b>355,-</b>
185	85	18,000	650	6.2	350	6	1.0	81	777027 0040	385,-
										7160

## SARA® One-handed pneumatic die grinder

- Small design for universal use in confined spaces
- Suitable for car and commercial vehicle repairs, mechanical engineering, body construction and metalwork
- Infinitely variable speed control
- Air consumption far below average due to the use of modern pneumatic motors
- Safety lever to prevent accidental switch-on
- Cold insulation on the handle
- Supplied with 1/4 inch BSPT air connection and plug nipple
- Exhaust air can be directed away from users via a 360° rotatable exhaust air cover on the side.
- Supplied with Ø 6 mm collet

### One-handed pneumatic die grinder

L mm	Height mm	max. speed r/min	Output W	Working pressure bar	Air consumption l/min	Collet Ø mm	Weight kg	Noise level dB	art.no.	€
150	55	25000	300	6.2	310	6.0	0.4	79.6	777026 0001	132,50
180	65	22000	400	6.2	395	6.0	0.5	72.2	777026 0002	120,50
260	60	22000	400	6.2	465	6.0	1.0	73.2	777026 0003	192,50
160	75	22000	300	6.2	225	6.0	0.4	79.8	777026 0004	163,-
180	80	21000	400	6.2	310	6.0	0.7	72.5	777026 0005	175,-

7160

### Accessories

Description	art.no.	€
Collet Ø 3 mm	777026 0103	29,50
Collet Ø 6 mm	777026 0106	22,60

7160



## SARA® Pneumatic belt grinder

- Very compact design for working in narrow spaces
- Easy replacement of abrasive belts thanks to integrated quick-clamp mechanism
- Handle can be angled individually by users to set the desired working position
- Cold protection due to insulated handle
- Exhaust air is directed away from users via an exhaust air cover
- Infinitely variable speed control via an easy to operate power control button
- Supplied with 1/4 inch BSPT air connection and plug nipple

L mm	Height mm	max. speed r/min	Working pressure bar	Air consumption l/min	Belt width mm	Weight kg	Noise level dB	art.no.	€
315	55	18500	6.2	310	10	0.9	82.4	777127 0001	255,-
390	66	16000	6.2	310	20	1.4	82.4	777127 0002	430,-

7160



### Abrasive belts, 10 units per pack

Width mm	L mm	Grain	art.no.	€
10	330	40	777128 0001	35,60
10	330	80	777128 0002	30,80
10	330	120	777128 0003	39,20
10	330	180	777128 0004	39,20
10	330	240	777128 0005	112,-
20	520	80	777228 0001	56,-
20	520	120	777228 0002	58,-
20	520	180	777228 0003	58,-
20	520	240	777228 0004	56,-

7160



## SARA® Pneumatic power drill

- **Lightweight design, high-speed with Ø 1 - 10 mm quick-release drill chuck**
- With spring balancer attachment on the casing
- High-quality planetary gearing and durable motor
- The top-mounted forward/reverse collar is suitable for right-handed and left-handed users
- Exhaust air can be directed away from users via a 360° rotatable exhaust air cover on the side
- Very low exhaust air noise
- Supplied with 1/4 inch BSPT air connection and plug nipple
- Easy-to-operate switch to select clockwise/anticlockwise rotation



L mm	Height mm	max. speed r/min	Output W	Working pressure bar	Chuck Ø mm	Weight kg	Noise level dB	Air consumption l/min	art.no.	€
170	155	1600	200	6.2	1-10	0.7	70.5	200	<b>777027 0001</b>	<b>265,-</b>
										7160

## SARA® Pneumatic hammer screwdriver, 1/2 inch

- Double ring hammer mechanism
- Modern appliance with low power/weight ratio
- Made from composite material, with high-alloy components for the hammer mechanism
- Robust and smooth motor
- Optimally adjusted 3-level control for clockwise rotation

### Pneumatic hammer screwdriver

L mm	Height mm	max. speed r/min	Torque N-m	Working pressure bar	Air consumption l/min	Weight kg	Noise level dB	art.no.	€	
160	170	11000	650-700	6.2	165	1.3	88.5	<b>777028 0001</b>	<b>295,-</b>	
190	185	8600	1150-1350	6.2	195	2.1	83.5	<b>777028 0002</b>	<b>306,-</b>	
										7160



777029 0003



777029 0010

### Socket sets

Description	Contents	art.no.	€	
Long, with protective coating, 1/2 inch	SW 17/19/21	<b>777029 0003</b>	<b>34,60</b>	
Short, 1/2 inch	SW 9/10/11/13/14/17/19/21/24/27	<b>777029 0010</b>	<b>64,10</b>	
				7160



Perfect protection ...

... with grip.

**ATORN®**  
Performance demands quality

## ATORN® Pneumatic aluminium blow guns

- Aluminium, anodised and silver coloured; for cleaning workpieces, machine parts and similar items.
- Air flow can be roughly regulated via a control lever
- Valve head made from special oil-resistant rubber
- Replaceable blowing nozzle, Ø 1.5 mm

### With standard nozzle

Connection	for interior Ø mm	Connection thread	art.no.	€
Plug nipple	-	G 1/4 Zoll	<b>742086</b> 0001	<b>20,90</b>
Hose connector	6	G 1/4 Zoll	742086 0006	<b>15,50</b>
Hose connector	9	G 1/4 Zoll	742086 0009	<b>15,50</b>
Hose connector	13	G 1/4 Zoll	742086 0013	<b>15,50</b>

7123

### With air jacket nozzle

- Eye protection with eight nozzle holes opening to the side

Connection	for interior Ø mm	Connection thread	art.no.	€
Hose connector	6	G 1/4 Zoll	<b>742088</b> 0006	<b>19,65</b>
Hose connector	9	G 1/4 Zoll	742088 0009	<b>19,65</b>

7123

### With safety nozzle

- Noise reduction by approx. 15 dB(A)
- Meets the following safety regulations and guidelines:
  - Swiss Accident Insurance Association (Schweizerische Unfallversicherungsanstalt - SUVA)
  - EU Directive 2003/10/EC (Noise)
  - EU Machinery Directive 2006/42/EC, EN12100
  - Noise and Vibration Protection Ordinance (TRLV-Lärm)
  - OSHA Regulations

Connection	for interior Ø mm	Connection thread	art.no.	€
Hose connector	6	G 1/4 Zoll	<b>742089</b> 0006	<b>34,50</b>
Hose connector	9	G 1/4 Zoll	742089 0009	<b>34,50</b>
Hose connector	13	G 1/4 Zoll	742089 0013	<b>34,50</b>

7123



## SARA® Plastic blow guns

- Precise dosing of compressed air due to infinitely variable trigger
- Comfortable working even in cold temperatures due to the all-plastic housing

### Modular pistol grip

- Compressed air connection G1/4 inch internal thread
- Nozzle connection, M12 x 1.25

Design	art.no.	€
Base body	<b>742100</b> 0101	<b>13,05</b>

7123

### Plastic pistol with extension nozzle and protective cap

- For working with scratch-prone components

Design	art.no.	€
With extension nozzle	<b>742100</b> 0001	<b>17,40</b>

7123

### Plastic pistol with SafetyStar nozzle

- With curved, star-shaped safety nozzle in the form of an extension nozzle
- Improved working conditions thanks to noise reduction below 80 dB (A)

Design	art.no.	€
With safety nozzle	<b>742100</b> 0002	<b>20,80</b>

7123

### Plastic pistol with BlowStar nozzle

- Combined safety and sound-insulating nozzle
- Noise reduction to as low as 74 dB (A)

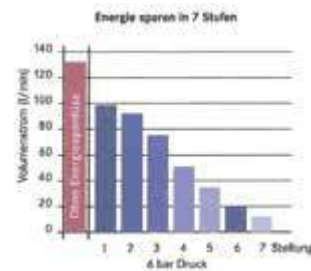
Design	art.no.	€
With safety extension nozzle	<b>742100</b> 0003	<b>34,30</b>

7123



## Air-saving nozzle

- Regulation of air quantity and reduction of pressure in conjunction with blow-out gun, max. operating pressure: 10 bar
- Aluminium base body, other parts plastic
- Volume flow at 6 bar: 10 to 95 l/min.
- **Advantages:** The energy-saving nozzle is controllable. Among other things, downward regulation prevents sharp, pointed chips or harmful liquids such as emulsions from flying around. This helps to avoid injuries.
- Controlled by turning the operating sleeve to 7 locked-in positions, labelled with +/-, total 125°



Model	Connection thread	art.no.	€
Air-saving nozzle	M 12 x 1.25	<b>742092 0006</b>	<b>17,95</b>

7123



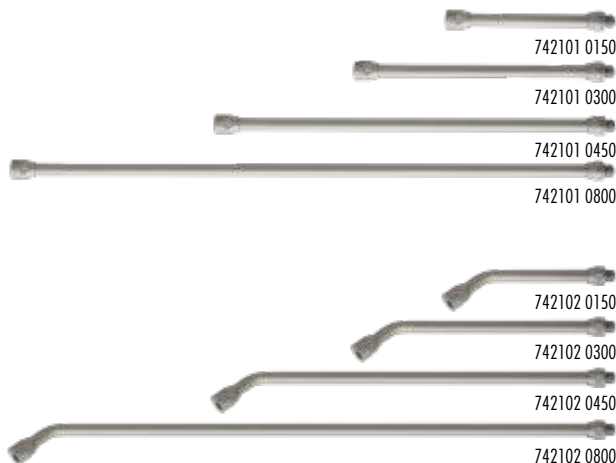
## ATORN® Accessories: blow guns

### Extensions for pneumatic blow guns

- For improved access to particularly difficult and/or awkward areas
- Robust extensions suitable for all **ATORN** and **SARA** blowguns
- Extensions can be equipped with all nozzles
- All extensions can be combined for an even larger length selection
- Material: Anodised aluminium

L mm	Straight		Angled	
	art.no.	€	art.no.	€
150	<b>742101 0150</b>	<b>16,10</b>	<b>742102 0150</b>	<b>17,20</b>
300	742101 0300	17,20	742102 0300	19,95
450	742101 0450	22,10	742102 0450	24,40
800	742101 0800	29,80	742102 0800	32,20

7123



### Extension nozzles

- In straight or curved form
- Pipe diameter 5 mm

Description	L mm	art.no.	€
Straight	115	<b>742100 0201</b>	<b>10,30</b>
Straight	165	742100 0202	10,85
Straight	265	742100 0203	11,10
Straight	415	742100 0204	15,80
Angled	110	742100 0211	10,85
Angled	160	742100 0212	11,40
Angled	260	742100 0213	13,55

7123



### Spare nozzles

Model	Connection thread	art.no.	€
Regular nozzle	M 12 x 1.25	<b>742092 0001</b>	<b>2,19</b>
Air jacket nozzle	M 12 x 1.25	742092 0002	5,70
Safety nozzle	M 12 x 1.25	742092 0003	20,20
Noise control nozzle	M 12 x 1.25	742092 0007	4,48
Safety flat jet nozzle	M 12 x 1.25	742092 0004	23,90
Extension nozzle 110 mm angled 45°, nickel-plated steel	M 12 x 1.25	742092 0100	5,30
Extension nozzle 110 mm angled 45°, nickel-plated steel, rubber cap	M 12 x 1.25	742092 0101	7,70
Full jet nozzle	M 12 x 1.25	742092 0059	14,15
Extension nozzle, 110 mm, angled, low-noise	M 12 x 1.25	742092 0019	8,75
Rubber cap		742092 0102	1,84

7123



## SARA® Accessories for pneumatic tools

### Spiral hose

- Tubes on both sides fully-integrated with rotating connecting threads (galvanised brass), as well as coupling and connector
- Connections with sealing ring
- Without narrowed cross-section
- Kink-resistant thanks to anti-kink protection
- Extremely flexible
- Lower wear than with polyamide hoses thanks to soft surfaces, whereby the risk of scratching sensitive surfaces is considerably reduced

SARA®

L m	Hose interior Ø mm	Connection thread	Working pressure bar	External Ø mm	art.no.	€
3	5	1/4"	18	8	<b>777038 0803</b>	<b>36,10</b>
6	5	1/4"	18	8	777038 0806	38,20
7.5	5	1/4"	18	8	777038 0807	40,30
3.5	8	3/8"	16	12	777038 1203	49,10
6	8	3/8"	16	12	777038 1206	57,50
7.5	8	3/8"	16	12	777038 1207	67,20
10	8	3/8"	16	12	777038 1210	76,30

7123



### Signal compressed air hose

- Working pressure max. 24 bar
- Bursting pressure 96 bar

SARA®

L mm	Interior Ø mm	External Ø mm	Description	art.no.	€
10	10	16	Polyurethane with Euro coupling and plug nipple	<b>777039 0001</b>	<b>49,10</b>
10	10	16	Polyurethane with 1/4 inch threaded connectors	777039 0002	46,20
50	10	16	Polyurethane roll material	777039 0003	136,50

7160



777039 0001

777039 0002

777039 0003

### Hose winder

- Coupling and nipple pre-connected

SARA®

L mm	Connection	Interior Ø mm	External Ø mm	Operating pressure max. bar	Dimensions W x D x H mm	Weight kg	art.no.	€
15	1/4 inch ET	8	12	15	400x175x330	8.5	<b>777030 0001</b>	<b>265,-</b>

7160



### Compressed air couplings

- One-hand quick coupling with barrel locking
- Non-return valve in the coupling
- Sliding sleeve up to 8 bar can be easily operated with one hand

SARA®

Connection	L mm	i mm	Wr. width mm	art.no.	€
1/4" AG	41	9	21	<b>742080 0214</b>	<b>4,06</b>
3/8" AG	41	9	21	742080 0238	4,06
1/2" AG	42.5	10.5	21	742080 0212	4,06
1/4" IG	41	8	21	742080 0314	4,06
3/8" IG	41	9	21	742080 0338	4,06
1/2" IG	43	10	24	742080 0312	4,06
DN6	57	25	21	742082 0106	4,33
DN9	57	25	21	742082 0109	4,33
DN13	57	25	21	742082 0113	4,67

7123



742080 0338

742082 0106

742080 0238



**Safety couplings**

- Safety coupling pursuant to ISO 4414, DIN EN 983 with push-button operation prevents 'whip effect' when uncoupling
- Wear parts made entirely of galvanised steel and housing made of aluminium, thus particularly sturdy and durable
- Threads and hose connections can be rotated under pressure
- Increased user comfort thanks to integrated moulded handle
- Sliding sleeve up to 8 bar can be easily operated with one hand
- REACH and RoHS-compliant
- **Steel plugs should be used as counterparts**

**Operation**

**Step 1** Press the button once to vent the coupling; the plug should remain secure in the sleeve.

**Step 2** Press the button a second time to unlock the plug, which can then be safely removed. **SARA®**

Connection	L mm	i mm	Wr. width mm	art.no.	€
1/4" AG	70.5	8	21	742080 0014	25,70
3/8" AG	70.5	8	21	742080 0038	25,70
1/2" AG	74.5	10	24	742080 0012	25,70
1/4" IG	68	8	21	742080 0114	25,70
3/8" IG	68	8	21	742080 0138	25,70
1/2" IG	71	10	24	742080 0112	25,70
DN6	86.5	25	19	742080 0006	25,70
DN9	86.5	25	19	742080 0009	25,70
DN13	86.5	25	19	742080 0013	25,70

7123



**Plug nipple**

- Plug without non-return valve

**Steel coupling nipples are characterised by high durability compared with brass nipples**

Connection	L mm	i mm	Wr. width mm	SARA® Brass		SARA® Steel	
				art.no.	€	art.no.	€
1/4" AG	33	9	17	742081 0214	1,78	742081 0014	3,86
3/8" AG	33	9	19	742081 0238	1,93	742081 0038	4,47
1/2" AG	33	10	24	742081 0212	3,96	742081 0012	6,10
1/4" IG	33	10	17	742081 0314	1,84	742081 0114	3,86
3/8" IG	33	10	19	742081 0338	1,93	742081 0138	4,47
1/2" IG	33	10	24	742081 0312	3,96	742081 0112	6,10
DN6	45	25	-	742083 0106	1,28	742081 0206	3,45
DN9	45	25	-	742083 0109	1,32	742081 0209	3,86
DN13	45	25	-	742083 0113	1,89	742081 0213	6,10

7123

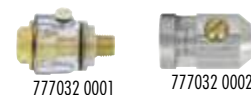
7123



**Portable device oiler**

Input	Outlet	Oil capacity ml	art.no.	€
1/4" IG	1/4" AG	4	777032 0001	25,80
3/8" IG	3/8" AG	28	777032 0002	62,60

7160



**Compressed air special lubricant**

- Compressed air special lubricant for mist lubricators and maintenance units pursuant to DIN 51 524-2 with viscosity class VG32 (viscosity at 40 °C -32 mm<sup>2</sup>/s, 32 cSt)
- Oil contains surface-active substances which offer corrosion protection across a wide temperature range
- Absorbs condensate (demulsifying)
- Temperature range: -20 °C to +80 °C

Description	Contents	art.no.	€
Special air lubricator	1 litre	777033 0010	19,55
Special air lubricator	5 litres	777033 0050	86,50

7123



Continued on next page >>>

**Magnetic plate**

Description	art.no.	€
Magnetic plate Ø 150 mm	777035 0001	14,45
Magnetic plate 240x140 mm	777035 0002	27,70

**Magnetic rods**

Description	art.no.	€
0.5 kg supported load	777037 0001	14,60
1.3 kg supported load	777037 0002	16,30

**SARA® Spring balancer**

- Rugged casing made from aluminium alloy
- Steel wire Ø 2.0 mm
- Infinitely variable load settings
- Working length easy to adjust
- Two-point mounting for maximum safety

Load capacity kg	L mm	Weight kg	art.no.	€
0.4 - 1.0	1600	0.63	777036 0410	69,70

**Maintenance unit****Maintenance unit**

- Modular principle, various extensions possible
- Plastic container
- Mineral oil with viscosity of 22 to 32 cSt should be used to protect the container
- Oil additives, anti-freeze or synthetic oils can corrode the plastic container

Connection	Air consumption l/min	Operating pressure max. bar	art.no.	€
1/4"	1500	16	777034 0100	120,50
1/2"	3400	16	777034 0101	185,50

**Spray pistols****Safety spray pistol**

- High-pressure spray gun for use with water pumps and for cooling lubricants
- With adjusting wheel and lever operation for increased safety
- Spray can be adjusted from full spray to jet spray
- Ideal for machining centres
- Material: Anodised aluminium, non-coloured

Connection thread	art.no.	€
DN13 (1/2")	742090 0001	99,70
DN19 (3/4")	742090 0002	99,70



**Safety gloves A-Mech 1**

- extremely light, thin and sensitive nylon knitted gloves with black soft PU coating on the palm and fingertips
- extended knitted cuff
- breathable
- **Uses:** precision work, assembly and maintenance work in dry or moderately oily conditions, automotive industry

Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 3131X KAT. II	<b>796121</b> 0007	<b>2,30</b>
Size 8	EN 388:2016 LEVEL 3131X KAT. II	796121 0008	<b>2,30</b>
Size 9	EN 388:2016 LEVEL 3131X KAT. II	796121 0009	<b>2,30</b>
Size 10	EN 388:2016 LEVEL 3131X KAT. II	796121 0010	<b>2,30</b>
Size 11	EN 388:2016 LEVEL 3131X KAT. II	796121 0011	<b>2,30</b>

7176

**Safety gloves A-Mech 2**

- thin, sensitive nylon knitted gloves with Spandex, black micro nitrile foam coating on the palm and fingertips
- extended knitted cuff
- breathable
- **Uses:** Assembly and maintenance works in dry, damp or oily conditions with high demands in facility and comfort, precision work, automotive industry, logistics

Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 4131X KAT. II	<b>796122</b> 0007	<b>3,62</b>
Size 8	EN 388:2016 LEVEL 4131X KAT. II	796122 0008	<b>3,62</b>
Size 9	EN 388:2016 LEVEL 4131X KAT. II	796122 0009	<b>3,62</b>
Size 10	EN 388:2016 LEVEL 4131X KAT. II	796122 0010	<b>3,62</b>
Size 11	EN 388:2016 LEVEL 4131X KAT. II	796122 0011	<b>3,62</b>

7176

flexible multi-talent



for maximum grip

**Safety gloves A-Mech 22**

- thin, sensitive nylon knitted gloves with Spandex, black micro nitrile foam coating and nitrile nubbing on the palm and fingertips
- extended knitted cuff
- breathable
- **Uses:** Assembly and maintenance works in dry, damp or oily conditions with high demands in facility, comfort and firm grip, precision work, logistics.

Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 4131X KAT. II	<b>796123</b> 0007	<b>3,77</b>
Size 8	EN 388:2016 LEVEL 4131X KAT. II	796123 0008	<b>3,77</b>
Size 9	EN 388:2016 LEVEL 4131X KAT. II	796123 0009	<b>3,77</b>
Size 10	EN 388:2016 LEVEL 4131X KAT. II	796123 0010	<b>3,77</b>
Size 11	EN 388:2016 LEVEL 4131X KAT. II	796123 0011	<b>3,77</b>

7176

**Safety gloves A-Mech 3**

- extremely thin and sensitive nylon knitted gloves with black micro nitrile foam coating on the palm and fingertips
- extended knitted cuff
- breathable
- **Uses:** Ideal for all tasks with high demands in facility, automotive industry, precision work, transport and sorting works



Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 3121X KAT. II	<b>796124</b> 0007	<b>3,92</b>
Size 8	EN 388:2016 LEVEL 3121X KAT. II	796124 0008	<b>3,92</b>
Size 9	EN 388:2016 LEVEL 3121X KAT. II	796124 0009	<b>3,92</b>
Size 10	EN 388:2016 LEVEL 3121X KAT. II	796124 0010	<b>3,92</b>
Size 11	EN 388:2016 LEVEL 3121X KAT. II	796124 0011	<b>3,92</b>

7176



Continued on next page &gt;&gt;&gt;

**Safety gloves A-Mech 4**

- thin, sensitive nylon/carbon knitted gloves with black micro nitrile foam coating on the palm and fingertips
- extended knitted cuff
- breathable
- touchscreen-compatible
- **Uses:** ESD sector, fine assembly work, automotive industry, precision work



touchscreen-compatible



Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 4131X KAT. II	<b>796125 0007</b>	<b>6,10</b>
Size 8	EN 388:2016 LEVEL 4131X KAT. II	796125 0008	6,10
Size 9	EN 388:2016 LEVEL 4131X KAT. II	796125 0009	6,10
Size 10	EN 388:2016 LEVEL 4131X KAT. II	796125 0010	6,10
Size 11	EN 388:2016 LEVEL 4131X KAT. II	796125 0011	6,10

7176

**ATORN® Cut-resistant gloves**

NEW

**Cut-resistant gloves A-Shield 1**

- extremely thin and sensitive HPPE special fibre knitted gloves with black micro nitrile foam coating on the palm and fingertips
- extended knitted cuff
- breathable
- **Uses:** precision work with moderate demands for cutting protection, metal and plastics processing, fine assembly work, automotive industry

Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 4X418 KAT. II	<b>796131 0007</b>	<b>7,55</b>
Size 8	EN 388:2016 LEVEL 4X418 KAT. II	796131 0008	7,55
Size 9	EN 388:2016 LEVEL 4X418 KAT. II	796131 0009	7,55
Size 10	EN 388:2016 LEVEL 4X418 KAT. II	796131 0010	7,55
Size 11	EN 388:2016 LEVEL 4X418 KAT. II	796131 0011	7,55

7176

Lightweight

**Cut-resistant gloves A-Shield 2**

- extremely thin and sensitive HPPE special fibre knitted gloves with black micro nitrile foam coating on the palm and fingertips, additional nitrile reinforcement around the thumb
- extended knitted cuff
- **Uses:** precision work with high demands for cutting protection, metal and plastics processing, paper and glass industry, automotive industry

Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 4X43C KAT. II	<b>796132 0007</b>	<b>9,45</b>
Size 8	EN 388:2016 LEVEL 4X43C KAT. II	796132 0008	9,45
Size 9	EN 388:2016 LEVEL 4X43C KAT. II	796132 0009	9,45
Size 10	EN 388:2016 LEVEL 4X43C KAT. II	796132 0010	9,45
Size 11	EN 388:2016 LEVEL 4X43C KAT. II	796132 0011	9,45

7176

**Cut-resistant gloves A-Shield 3**

- thin, sensitive nylon knitted gloves made of HPPE special/basalt fibre with Spandex, black micro nitrile foam coating on the palm and fingertips, additional nitrile reinforcement around the thumb
- extended knitted cuff
- **Uses:** precision work with very high demands for cutting protection, metal and plastics processing, paper and glass industry, automotive industry

Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 4X43D KAT. II	<b>796133 0007</b>	<b>11,90</b>
Size 8	EN 388:2016 LEVEL 4X43D KAT. II	796133 0008	11,90
Size 9	EN 388:2016 LEVEL 4X43D KAT. II	796133 0009	11,90
Size 10	EN 388:2016 LEVEL 4X43D KAT. II	796133 0010	11,90
Size 11	EN 388:2016 LEVEL 4X43D KAT. II	796133 0011	11,90

7176





**Cut-resistant gloves A-Shield 4**

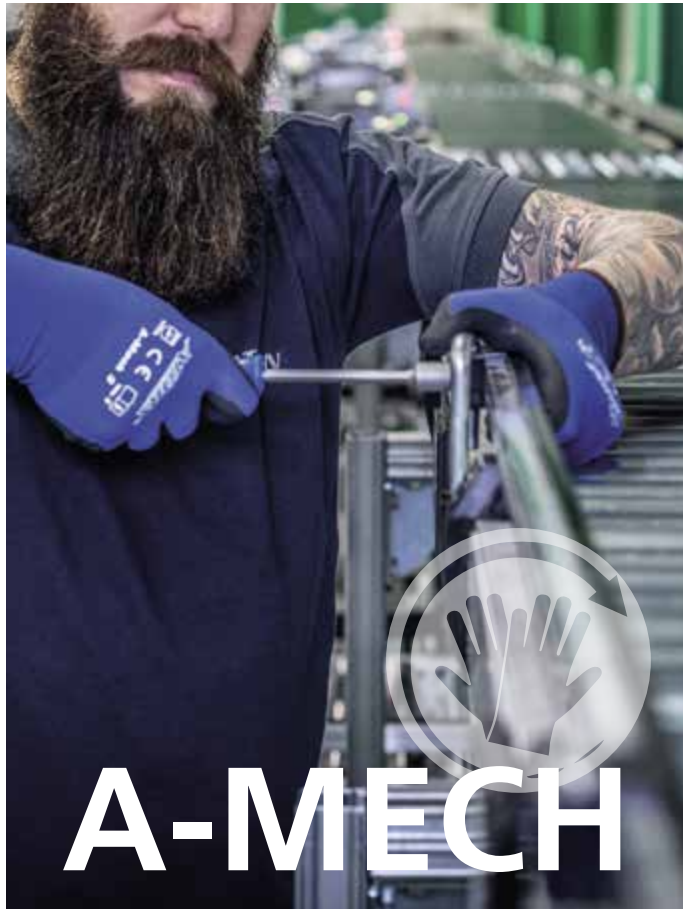
- Knitted gloves made of HPPE special/basalt/steel fibre with Spandex, sanded nitrile foam coating on the palm and fingertips, additional nitrile reinforcement around the thumb
- extended knitted cuff
- **Uses:** Tasks with extremely high demands in cutting protection, sheet metal processing and metal machining, maintenance and assembly

**ultimate protection**



Description	Shade	art.no.	€
Size 7	EN 388:2016 LEVEL 4X43F KAT. II	<b>796134 0007</b>	<b>15,90</b>
Size 8	EN 388:2016 LEVEL 4X43F KAT. II	796134 0008	15,90
Size 9	EN 388:2016 LEVEL 4X43F KAT. II	796134 0009	15,90
Size 10	EN 388:2016 LEVEL 4X43F KAT. II	796134 0010	15,90
Size 11	EN 388:2016 LEVEL 4X43F KAT. II	796134 0011	15,90

7176



**A-MECH**



**ATORN®**











**A-SHIELD**




# Safety and Environment

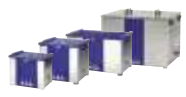
## Aerosol filters


	Centrifugal separator		1564
	Monitoring system F-Monitor	<b>NEW</b>	1566
	Emulsion mist separator Ultra-Eco compact		1569
	Emulsion mist separator Ultra-Cleaner	<b>NEW</b>	1570
	Ultra Jet emulsion mist separator		1572
	Modular separator with spray system	<b>NEW</b>	1573
	Electrostatic oil mist separator	<b>NEW</b>	1574
	Mobile smoke filter		1575
	Mobile indoor air filters	<b>NEW</b>	1576
	Dry dust filter system		1577
	Installation accessories for filter systems		1578


## Filter fleece


	Filter fleece for switch cabinets, compressors and motors		1580
---	---	--	------

## Parts cleaning


	Ultrasonic cleaning equipment		1581
---	-------------------------------	--	------


	Ultrasonic cleaning equipment with heating system Elmasonic EASY	<b>NEW</b>	1581
--	--	------------	------


	Absorber cabinet		1583
---	------------------	--	------


	Compact Clean bio-parts washing table	<b>NEW</b>	1584
---	---------------------------------------	------------	------


## Cutting fluid

	Cutting wax pen	<b>NEW</b>	1586
--	-----------------	------------	------


	Thread cutting paste	<b>NEW</b>	1586
---	----------------------	------------	------


	Cutting oils	<b>NEW</b>	1587
---	--------------	------------	------

	Cutting fluid concentrate	<b>NEW</b>	1588
---	---------------------------	------------	------


	Cleaner	<b>NEW</b>	1589
---	---------	------------	------

## Drum emptying, machine filling

	Barrel pumps		1589
--	--------------	--	------

	Filling level display		1589
--	-----------------------	--	------

	Mixers		1590
--	--------	--	------


	Overflow protection sirens		1590
---	----------------------------	--	------

## Emulsion testing

	Refractometer		1591
--	---------------	--	------

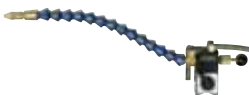






	Emulsion treatment case	1591
---	-------------------------	------

## Cooling systems


	Coolant delivery systems	1592
--	--------------------------	------

	Coolant spray systems	1594
--	-----------------------	------


	Coolant high-pressure nozzles	1594
---	-------------------------------	------


	Cold air nozzles	1595
--	------------------	------


## Emulsion treatment


	Emulsion treatment station Emulsion treatment cart	1596
---	---	------


	Magnetic filters	1598
---	------------------	------

	Skimmer systems	1599
---	-----------------	------

	Cooling lubricant aerator	1600
---	---------------------------	------


	Chip and emulsion vacuum cleaner	<b>NEW</b> 1601
---	----------------------------------	-----------------

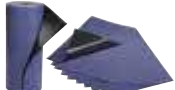
	Compressed air chip and wet vacuum cleaner	<b>NEW</b> 1601
---	--	-----------------

	Compressed air industrial vacuum cleaner	<b>NEW</b> 1602
---	--	-----------------

## Leak repair and protection


	Mats	1605
---	------	------

	Universal absorbent fleece	<b>NEW</b> 1606
--	----------------------------	-----------------

	Grippy mat with adhesive backing	1607
--	----------------------------------	------

	Grippy mat with safety edge	<b>NEW</b> 1607
--	-----------------------------	-----------------

	Absorbent socks	1611
--	-----------------	------


	Drain cover	1611
--	-------------	------

	Spreading grit	1612
---	----------------	------


## Foot grilles and floor mats


	Wooden foot grating	1613
--	---------------------	------

	Workplace mats	1614
--	----------------	------

	Flame-retardant workplace mat	<b>NEW</b> 1616
--	-------------------------------	-----------------

## Chip tipper Conveying equipment accessories

	Chip tippers, chip containers, tipping troughs	1617
--	--	------

	Load hooks	1621
--	------------	------

	Collection trays	1621
--	------------------	------



- Oil mist is harmful to health.
- Oil mist causes slippery floors and can cause damage to electrical switchgears.
- Oil mist can lead to deposits in ventilation pipes. This is a fire hazard.
- Laws and regulations are becoming more and more stringent.
- The recirculation of purified air reduces energy and heating costs.

► Centrifugal separators create cleaner, safer and more productive workplaces!

### Function

- 1 Oil mist is eliminated at the source.
- 2 Oil mist is removed from the air using centrifugal force.
- 3 The separated oil is returned to the machine.
- 4 Clean air is released back into the workshop.
- 5 A special secondary filter allows for the removal of smoke and steam and increases the degree of separation.

A perforated drum with specially designed blades rotates at high speed. Oil mist is sucked into the device and bounces off the blades. Filter mats aid the process in which small droplets form larger ones and filter out swirling solid particles. Centrifugal force presses the oil into the housing wall of the device. From here it is fed back into the machine or collecting container. What is left is cleaner air, which is returned to the factory floor.



### Mounting options



## FILTERMIST Centrifugal separator S series and XCEL2

- Efficiently removes oil and coolant mist, smoke and steam
- **Material:** Turning, milling, wet grinding, sawing, EDM / spark eroding, food processing and parts washing
- All versions comply with CE regulations.
- **Energy-efficient IE3 motors for models FX4002 - FX7002**
- **Test certificate available for IFA-tested smoke filter on request**
- Standard colour RAL 7035 (light grey), other RAL colours available on request
- **Stainless steel version:** For the removal of smoke and vapour when washing parts (parts washing machine / partswasher)
- **Supplied with:** Oil return hose (S series 2 m, FX series 4 m), assembly and operating instructions, no appliance switch
- **Pricing:** ex works, including packaging



### Single units

Model	Air quantity m³/h	Motor output kW	Connection 380V Hz	Connection 400V Hz	Connection 440V Hz	Connection 460V Hz	Connection 480V Hz	Connection 575V Hz	Weight kg	Inlet Ø mm	Noise level dB	D mm	H mm	art.no.	€	Stainless steel	
																art.no.	€
S 200	180	0.18	50	50	60	60	60	60	9	75	62	260	302	902010 0200	2.099,-	902020 0200	2.819,-
S 400	425	0.55	50	50	60	60	60	60	14	150	65	325	381	902010 0400	2.379,-	902020 0400	3.199,-
S 800	800	0.55	50	50	60	60	60	60	15	150	67	325	435	902010 0800	2.999,-	902020 0800	4.069,-
FX 4002	1250	1.1	50	50	60	60	60	60	25.8	150	70	357	544	902010 4002	3.479,-	902020 4002	4.679,-
FX 5002	1675	1.5	50	50	60	60	60	60	31.8	200	71	357	634.5	902010 5002	3.639,-	902020 5002	4.919,-
FX 6002	2000	2.2	50	50	60	60	60	60	36.8	200	73	438	638.5	902010 6002	3.979,-	902020 6002	5.379,-
FX 7002	2750	2.2	50	50					36.8	200	73	438	638.5	902010 7002	5.199,-	902020 7002	7.039,-

9101

9101



Stand-mounted with side intake



Mounted directly on automatic lathes



Section view

## FILTERMIST Accessories: filter systems

### Smoke filter

- filters out smoke particulate that can occur during heavy machining
- for particle sizes < 1 µm
- from S400 filter class H13 available on request

Description	S series / X-CEL2	X-CEL	F series model 6 to 8	art.no.	€
Smoke filter EN 779 2002 filter class F8	S200	-	-	902070 0002	480,-
Smoke filter EN 779 2002 filter class F8	S400, S800, FX200, FX3002	FX2000	F7	902070 0011	490,-
Smoke filter EN 779 2002 filter class F8	FX4002, FX5002	FX3000, FX4000, FX5000, FX6000	-	902070 0004	499,-
Smoke filter EN 779 2002 filter class F8	FX6002, FX7002	FX7000	F13 to F34	902070 0001	509,-

9102



Smoke filter with test certificate

### Superfine particle filter

#### • Compact and low-cost method to remove ultra-fine oil mist particles from the workshop air

- Synthetic high-tech filter material with a drainage effect
- Enables the recirculation of filtered oil through a patented Venturi suction system - extends the service life of the filter and lowers operating costs.
- Certified in accordance with EPA class E10

Designation	suitable for model	art.no.	€
Post-filter S-Fusion	S200, S400, S800	902070 0200	1.329,-
Post-filter FX-Fusion	FX4002, FX5002, FX6002, FX7002	902070 4002	1.379,-
Adapter	S200	902070 0210	192,50
Adapter	FX6002, FX7002	902070 0230	499,-

9101

**Ideal for chip removal processes with pure oil cooling and high-pressure pumps**



### Silencer

- Reduces the noise level by 5 to 10 dB
- Cannot be used in conjunction with the smoke filter

Description	suitable for model	art.no.	€
Silencer	FX4002, FX5002	902050 1079	450,-
Silencer	FX6002, FX7002	902050 0070	579,-

9102



Silencer

### Assembly kits

NEW

Contents	suitable for model	art.no.	€
Flange connection Ø 75 mm, 3 m hose Ø 75 mm, 2 hose clamps Ø 75 mm, F-Monitor 2	S200	902070 0067	849,-
Flange connection Ø 100 mm, 3 m hose Ø 100 mm, 2 hose clamps Ø 100 mm, F-Monitor 2	S400, S800, S400, S800, FX4002 with reducer	902070 0068	859,-
Flange connection Ø 150 mm, 3 m hose Ø 150 mm, 2 hose clamps Ø 150 mm, F-Monitor 2	S400, S800, FX4002	902070 0069	929,-
Flange connection Ø 200 mm, 3 m hose Ø 200 mm, 2 hose clamps Ø 200 mm, F-Monitor 2	FX5002, FX6002, FX7002	902070 0070	959,-

9102



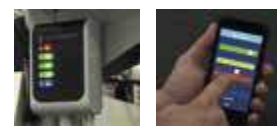
### Monitoring system F-Monitor

- measures the air flow and run time of the filter system
- **F Monitor 2+ also measures the motor temperature and vibrations**
- An LED traffic-light system warns the machine operator or indicates when a service is required.
- App control via **Bluetooth interface**
- The optional sensor monitors the vibrations and the temperature (already included with F-Monitor 2+)

NEW

Model	Description	art.no.	€
F-Monitor 2 incl. accessories, no sensor	measures air flow and time	902011 0001	669,-
F-Monitor 2+ incl. accessories, with sensor	measures air flow, time, vibration and temperature	902011 0002	739,-

9102



902011 0002



902011 0001

### Sensor

NEW

Description	suitable for model	art.no.	€
Sensor	F-Monitor 2	902011 0010	135,-

9102



## Spare parts, consumables

• Please note the serial number of the filter system!

Description	S series / X-CEL2	X-CEL	F series model 6 to 8	art.no.	€
Discharge filter	S200	-	-	<b>902070 0058</b>	<b>61,10</b>
	S400, S800	-	-	902070 0059	61,10
	FX2002, FX3002	FX2000	F7 all series	902070 0021	50,50
	FX4002, FX5002	FX3000 to FX6000	-	902070 0025	116,50
	FX6002, FX7002	FX7000	F13, to F34 Series 7 and 8	902070 0020	93,50
Cover seal	S200	-	-	902070 0057	15,-
	-	-	F7	902070 0031	19,90
	S400, S800, FX2002, FX3002	FX2000	-	902070 0027	16,90
	FX4002, FX5002	FX3000 to FX6000	-	902070 0026	21,50
	FX6002, FX7002	FX7000	F13 to F34 Series 7 and 8	902070 0043	16,80
Filter inserts set	S200	-	-	902070 0054	33,10
	S400, FX2002	FX2000	F7 all series	902070 0055	37,60
	S800, FX3002	-	-	902070 0056	58,-
	FX4002	FX3000, FX4000	-	902070 0023	58,50
	FX5002	FX5000, FX6000	-	902070 0022	64,60
	FX6002, FX7002	FX7000	F28 Series 6 and 7, F34	902070 0010	57,50
	-	-	F13, F21 Series 6 and 7	902070 0014	46,70
	-	-	F14, F21 from Series 8	902070 0013	46,70
-	-	F28 from Series 8	902070 0012	57,50	
Motor 0.18 kW	S200	-	-	902070 0101	480,-
Motor 0.55 kW	S400, S800	FX2000	F7	902070 0100	569,-
Motor 1.1 kW	FX4002	FX3000	F13, F14, F21	902070 0105	839,-
Motor 1.50 kW	FX4002	FX4000 to FX6000	F14 to F28	902070 0102	899,-
Motor 2.20 kW	FX5002 to FX7002	FX7000	F34	902070 0103	919,-
Barrel incl. filter mats	S200	-	-	902070 0006	440,-
	S400	-	-	902070 0007	440,-
	S800	-	-	902070 0008	719,-
	FX2002	FX2000	F7	902070 0035	440,-
	FX3002	-	-	902070 0046	579,-
	FX4002	FX3000, FX4000	-	902070 0034	739,-
	FX5002	FX5000	-	902070 0033	769,-
	FX6002	-	F34	902070 0048	799,-
	FX7002	FX7000	-	902070 0044	1.049,-
	-	FX6000	-	902070 0032	769,-
	-	-	F13, F14, F21	902070 0111	859,-
-	-	F28 all series	902070 0112	859,-	
Vibration damper for motor fitting	S400, S800	FX2000	F7	902070 0037	73,80
	FX4002 to FX7002	FX3000 to FX7000	F13 to F34	902070 0036	107,-
Maintenance kit: filter mats, discharge filters, cover seals, vibration dampers	S200	-	-	902070 0060	102,-
	S400	-	-	902070 0061	175,-
	S800	-	-	902070 0062	188,50
	2002	FX2000	-	902070 0041	147,50
	FX3002	-	-	902070 0042	162,-
	FX4002	FX3000, FX4000	-	902070 0040	260,-
	FX5002	FX5000, FX6000	-	902070 0039	260,-
	FX6002, FX7002	FX7000	-	902070 0047	260,-
	-	-	F7	902070 0053	182,50
	-	-	F14, F21 Series 8	902070 0051	260,-
	-	-	F28 Series 7, F34 Series 7 and 8	902070 0049	260,-
-	-	F28 Series 8	902070 0050	260,-	

9102



Discharge filter



Cover seal



Filter inserts



Motor



Vibration damper



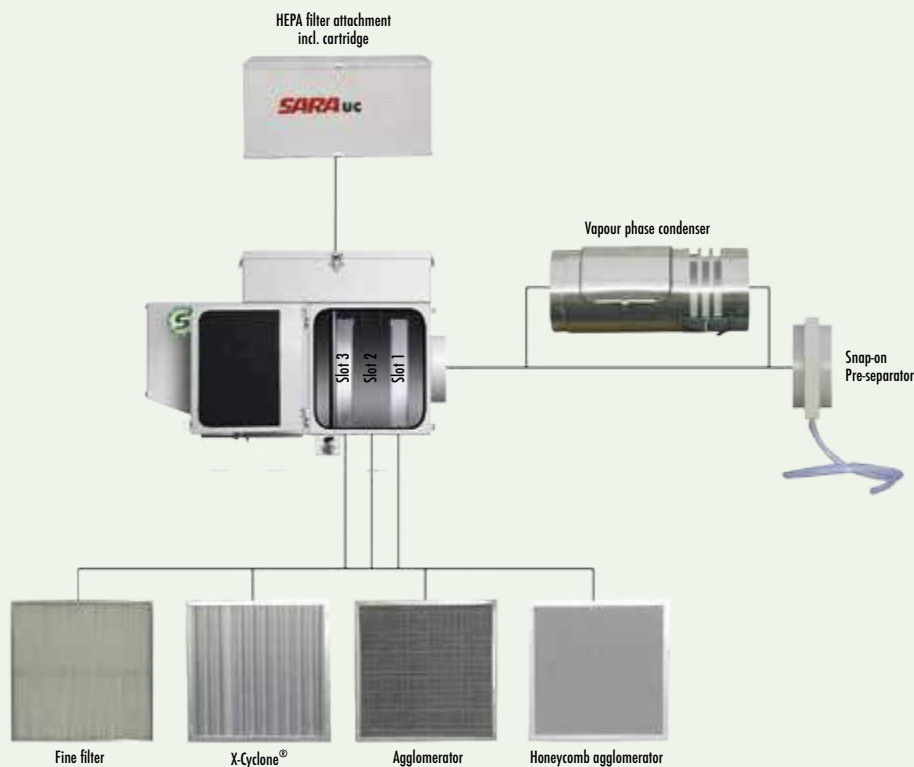
Maintenance kit





**SARA® Ultra-Cleaner modular emulsion mist separator**

**INFO**



**SARA® X-Cyclone® separator**

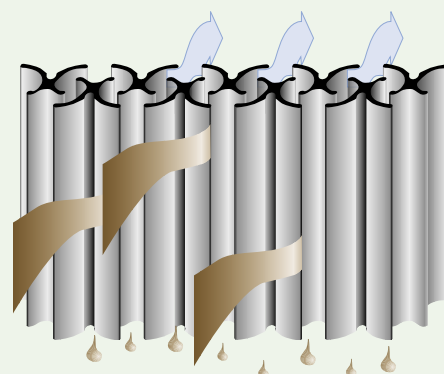
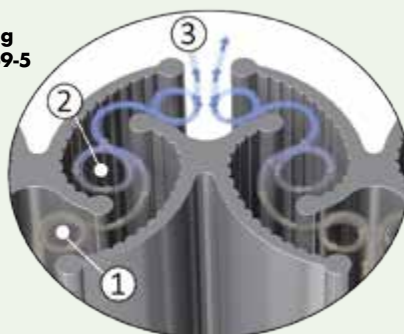
**INFO**

**Advantages:**

- Separation efficiency up to 99.999 %
- Completely maintenance-free and self-cleaning
- Flame retardant in accordance with DIN 18869-5 and DIN 16282-6
- Made of rust-resistant materials
- Not a disposable product
- Lifetime guarantee

**Technology and operating principle:**

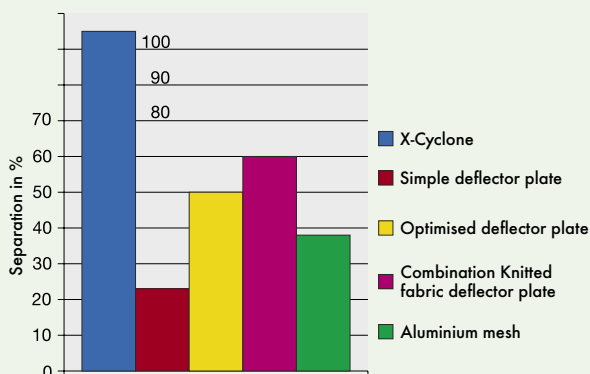
The aerosol-contaminated exhaust air flows into the X-CYCLONE® separator where it is accelerated to a high speed. This acceleration generates three rotating vortices which force the airborne aerosol particles against the profile, causing them to separate and run off as a liquid.



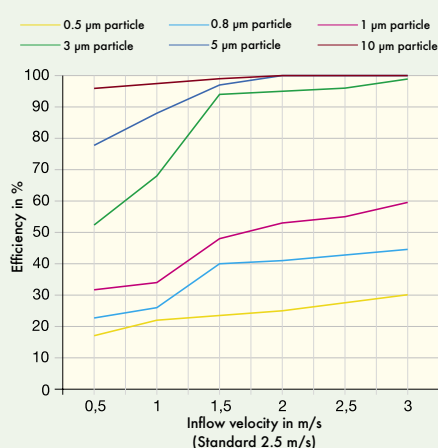
**Flame exposure test according to DIN EN 16282**

Air can flood the X-Cyclone® basic element, but the flames are blocked. Even in the event of an explosion in the workspace, the X-Cyclone® prevents any penetration of the flames and blast. Downstream equipment or drainage systems are thus protected.

**Effectiveness of various pre-separators by comparison**



**Separation efficiency of various particle sizes**





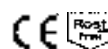
**SARA®**

# EMULSION MIST SEPARATOR ULTRA-ECO COMPACT

The SARA® Ultra-Eco compact emulsion mist separator is a compact and energy-efficient high-performance separation system for separating aqueous aerosols within machining systems. In order to achieve optimal separation efficiency, the flow behaviour was computer-simulated and the design of the filter unit adjusted until the best possible separation efficiency (of up to 99.9999 %) of dirt particles was achieved.

## SARA® Emulsion mist separator Ultra-Eco compact

- CFD-optimised high-performance separation system with a separation rate of up to 99.9999%.
- Thanks to European ErP directives, energy savings of several thousand euros are possible compared to conventional air purifiers.
- for processing machines up to approx. 2m<sup>3</sup> workspace volume
- effective separation of liquid-based aerosols
- compact design, direct assembly on the machine
- robust and torsion-free housing made of powder-coated stainless steel
- integrated long-term HEPA filter
- designed, constructed and produced in Germany
- **Supplied with:** Emulsion mist separator Ultra-Eco compact, HEPA filter
- **Pricing:** ex works, including packaging



**Compact and energy-efficient**



### Single unit

Model	Volume flow min. m <sup>3</sup> /h	Volume flow max. m <sup>3</sup> /h	Dimensions L x W x H mm	Connection Ø mm	Weight kg	Noise level dB	Motor output kW	I(A)	Tension V	art.no.	€
UEC-1000	200	1000	345 x 345 x 595	200	27	67	0.168	1.4	230	<b>909090 0010</b>	<b>2.179,-</b>
9111											

### Spare parts, consumables

Description	art.no.	€
Long-term HEPA filter	<b>909090 0100</b>	<b>267,-</b>
Silencer mat	909090 0120	133,50
Motor 220 VAC, 50/60 Hz	909090 0110	569,-
9104		



909090 0120



909090 0100



**SARA® Ultra-Cleaner modular emulsion mist separator****NEW**

- **Mechanical, with patented X-Cyclone® agglomerator system**
- **Thanks to European ErP directives, energy savings of several thousand euros are possible compared to conventional air purifiers.**
- **Works without disposable filters – no subsequent costs!**
- Effective separation of oils, emulsions, other fluids and solid particles
- Complete unit as a recirculating device with an integrated ventilator
- Robust and torsion-free housing made of powder-coated stainless steel (RAL 7035, light grey), smooth internal surface and with service opening
- Bottom section formed as an oil and water-tight collection tray
- Collecting tray fitted with drain cock for emptying, optional siphon available
- Thanks to the diverse installation and assembly possibilities of the Ultra-Cleaner system, most extraction problems arising in connection with various machining processes and the use of different coolant lubricants and oils can be solved with a single appliance.
- Developed, designed and manufactured in conformity with the relevant EU directives
- Ultra-Cleaners are tested for flame resistance in accordance with DIN EN 16282
- Separation efficiencies tested and confirmed by the Fraunhofer Institute for Toxicology and Experimental Medicine
- Permissible ambient temperature for all models 0°C to 50°C
- **Supplied with:** Ultra-Cleaner with frequency converter and motor cover, agglomerator and X-Cyclone® filter insert
- **Pricing:** ex works, including packaging

**Self-regulating separator**

909100 0030

**Single units**

- **Filter system automatically regulates the motor output according to the degree of contamination of the separator. This guarantees that the volume flow, inflow velocity and separation efficiency remain the same until complete contamination (red status indicator).**

- Digital wear indicator

Model	Volume flow min. m <sup>3</sup> /h	Volume flow max. m <sup>3</sup> /h	Dimensions L x W x H mm	Connection Ø mm	Weight kg	Noise level dB	Motor output kW	I(A)	Tension V	Right-hand		Left-hand	
										art.no.	€	art.no.	€
UCS-Mini	300	500	360 x 355 x 565	150	25	50	0.18	0.52	400	909100 0001	2.419,-	909105 0001	2.419,-
UC1SD	500	1000	865 x 360 x 640	200	44	67	0.65	1.6	400	909100 0010	3.889,-	909105 0010	3.889,-
UC2SD	1000	2000	900 x 440 x 720	200	62	69	1.4	3.1	400	909100 0020	5.399,-	909105 0020	5.399,-
UC3SD	2000	3000	945 x 520 x 800	300	93	69	1.55	4.4	400	909100 0030	7.749,-	909105 0030	7.749,-
										9103		9103	

**Ultrasonic cleaning**

Elma ultrasonic cleaning devices are recommended for cleaning filter stages and collector cells.



**Ultrasonic cleaning is one of the best cleaning methods around today.**

**It is ecological, economical, intensive and gentle all at the same time.**

**Ideal for cleaning filter stages**

## SARA® Accessories: filter systems

### Vapour phase condenser

- Increases the extraction efficiency of the filter
- For enlarging particles upstream of the filter system
- For machining with coolant pressures > 20 bar

Description	suitable for	art.no.	€
Vapour condenser 200 mm, L = 400 mm	UC1SD/UC2SD	<b>909005 0037</b>	<b>869,-</b>
Vapour condenser 300 mm, L = 400 mm	UC3SD	909005 0038	1.159,-
Stainless steel insert for vapour phase condenser	UC1SD/UC2SD	909005 0040	250,-
Stainless steel insert for vapour phase condenser	UC3SD	909005 0041	301,-

9104



Vapour phase condenser

### HEPA filter attachment

- Filters out smoke particulate that can be generated during heavy machining
- For particle sizes < 1 µm

suitable for	Description	art.no.	€
UCS-Mini	HEPA filter attachment incl. cartridge	<b>909005 0053</b>	<b>559,-</b>
UC1SD	HEPA filter attachment incl. cartridge	909005 0030	779,-
UC2SD	HEPA filter attachment incl. cartridge	909005 0031	829,-
UC3SD	HEPA filter attachment incl. cartridge	909005 0032	829,-
UCS-Mini	Replacement cartridge DIN EN 60335-2-69:2008 H	984901 3335	326,-
UC1SD	Replacement cartridge DIN EN 60335-2-69:2008 H	909005 0007	470,-
UC2SD	Replacement cartridge DIN EN 60335-2-69:2008 H	909005 0017	509,-
UC3SD	Replacement cartridge DIN EN 60335-2-69:2008 H	909005 0008	549,-

9104



Spare cartridge

UC2SD with HEPA filter attachment

### Honeycomb agglomerator

- For agglomerating very fine emulsion particles
- Honeycomb structure for an extremely large surface area
- Washable

Description	suitable for	art.no.	€
Honeycomb agglomerator 330 x 330 x 50	UCS-Mini / UC1SD	<b>909005 0110</b>	<b>619,-</b>
Honeycomb agglomerator 410 x 410 x 50	UC2SD	909005 0112	759,-
Honeycomb agglomerator 490 x 490 x 50	UC3SD	909005 0111	1.019,-

9104



Honeycomb agglomerator

### Fine filter

- Extracts small smoke particulate and fine oil particles up to 1 µm
- For thin, resin-free oils
- Coated, partly washable

Description	suitable for	art.no.	€
Fine filter insert	UCS-Mini / UC1SD	<b>984901 3333</b>	<b>219,-</b>
Fine filter insert	UC2SD	984901 4141	301,-
Fine filter insert	UC3SD	984901 4949	365,-

9104



Fine filter, coated

### Spare parts

Description	suitable for	art.no.	€
X-Cyclone 330 x 330 x 50	UCS-Mini / UC1SD	<b>984900 3333</b>	<b>460,-</b>
X-Cyclone 410 x 410 x 50	UC2SD	984900 4141	589,-
X-Cyclone 490 x 490 x 50	UC3SD	984900 4949	699,-
Agglomerator 330 x 330 x 30	UCS-Mini	909005 0013	415,-
Agglomerator 330 x 330 x 50	UC1SD	909005 0010	475,-
Agglomerator 410 x 410 x 50	UC2SD	909005 0012	609,-
Agglomerator 490 x 490 x 50	UC3SD	909005 0011	759,-
Silencer insert 530 x 320 x 65	UC1SD	909005 0026	89,-
Silencer insert 575 x 400 x 65	UC2SD	909005 0027	111,-
Silencer insert 610 x 475 x 65	UC3SD	909005 0028	131,50

9104



Agglomerator

X-Cyclone



Silencer insert

## SARA® Ultra-Jet emulsion mist separator

- **Mechanical, with patented X-Cyclone® agglomerator system**
- **Thanks to European ErP directives, energy savings of several thousand euros are possible compared to conventional air purifiers.**
- **No speed regulation**
- **No disposable filters**
- Depending on size, suitable for processing machines of approx. 1-3 m<sup>3</sup> Suitable for internal chamber volume and light-duty chip-removal processes
- Compact design, direct mounting on the machine
- Up to four filter stages, can be retrofitted with a HEPA filter
- Dynamic-static combined filter system
- Dynamically balanced high-performance fan integrated into the filter unit
- Service opening with quick-release clamps
- ULTRA-JET is tested for flame resistance in accordance with DIN EN 16282
- Stainless steel housing powder-coated in RAL 7035 (light grey), high-performance X-Cyclone® separator profiles made of aluminium
- **Supplied with:** Ø 160/150 mm reducer with chip pre-filter insert, 3 m oil return hose
- **Pricing:** ex works, including packaging



### Single units

Model	Volume flow max. m <sup>3</sup> /h	Dimensions L x W x H mm	Connection Ø mm	Weight kg	Motor output kW	I(A)	Tension V	Noise level dB	art.no.	€
Ultra-Jet 1	1000	410 x 410 x 480	150	20	0.25	0.74	400	69	<b>909016 0010</b>	<b>2.519,-</b>
Ultra-Jet 2	1400	410 x 410 x 480	150	22	0.5	1.3	400	73	909016 0020	<b>3.149,-</b>

9103

### HEPA filter attachment

- Filters out smoke particulate that can occur during heavy machining
- For particle sizes < 1 µm

Description	suitable for	art.no.	€
HEPA filter attachment incl. cartridge	Ultra-Jet 1 & 2	<b>984901 3337</b>	<b>789,-</b>
Replacement cartridge DIN EN 60335-2-69:2008 H	Ultra-Jet 1 & 2	984901 3338	<b>331,-</b>

9103



### Accessories

Description	suitable for model	art.no.	€
Fine filter attachment incl. cartridge	Ultra-Jet 1 & 2	<b>984902 0010</b>	<b>529,-</b>
Silencer mat	Ultra-Jet 1 & 2	984901 0010	<b>123,50</b>
Stand 2 m for Ultra-Jet	Ultra Jet 1 & 2	909015 0005	<b>839,-</b>

9103



984901 0010



984901 3338



## SARA® Modular separator with spray system

NEW

- Thanks to European ErP directives, energy savings of several thousand euros are possible compared to conventional air purifiers.
- Specially developed for use when machining dry cast iron, graphite and plastics, and for machining processes which generate extensive vapour and smoke.
- Water wall formed inside the appliance for pre-filtering
- Aerosols, solid particles such as dust created by cast iron machining, and hazardous gas molecules are bound and washed out
- The filter system must be connected to the existing cooling circuit on the machine or alternatively to a separate tank and pump supplied by the customer.
- 1" hose connection for inlet and 2" thread for outlet
- Flow-optimised air duct inside the appliance ensures that the entire filter surface is sprayed while reducing water circulation volume.
- The service life of the recirculated coolant is extended as a result of oxygenation
- Separation of aerosols and liquid particles by the patented X-Cyclone® and agglomerator system
- Permissible ambient temperature 0°C to 50°C
- Stainless steel housing, powder-coated in RAL 7035 (light grey)
- other RAL colours available on request
- **Supplied with:** Spray mist separator with nozzles, agglomerator and X-Cyclone® filter insert
- **Pricing:** ex works, including packaging



Self-regulating separator



909140 2500

### Single units

- Filter system automatically regulates the motor output according to the degree of contamination of the separator. This guarantees that the volume flow, inflow velocity and separation efficiency remain the same until complete contamination (red status indicator).
- Digital wear indicator

Model	Air quantity m <sup>3</sup> /h	Dimensions L x W x H mm	Connection Ø mm	Weight kg	Noise level dB	Motor output kW	I(A)	Tension V	Right-hand		Left-hand	
									art.no.	€	art.no.	€
UCSD 800	800	1050 x 370 x 765	150	52	63	0.25	0.74	400	909140 0800	4.889,-	909145 0800	4.889,-
UCSD 1200	1200	1200 x 370 x 765	200	60	65	0.5	1.3	400	909140 1200	8.039,-	909145 1200	8.039,-
UCSD 2500	2500	1280 x 550 x 925	300	116	67	1.17	2.6	400	909140 2500	10.849,-	909145 2500	10.849,-
UCSD 4000	4000	1300 x 655 x 1045	300	158	72	1.6	3.55	400	909140 4000	15.999,-	909145 4000	15.999,-
									9103		9103	

### Accessories

Description	art.no.	€
Connection kit incl. magnetic valves, Siemens controller, installation material, without pump	909041 0010	3.099,-
9104		

## The spray system

### Cleaning, increasing efficiency and air scrubbing

The spray system cleans the X-CYCLONE® aerosol separators in extraction systems, thus increasing separation efficiency, particularly for dusty exhaust air or sticky substances.

In addition, the spray system cleans the air in a similar way to air scrubbers in the chemical industry. The **permanent air scrubbing function** removes the smallest aerosols and harmful gases from the air.



High extraction efficiency



## SARA® Electrostatic oil mist separator

NEW

- Thanks to European ErP directives, energy savings of several thousand euros are possible compared to conventional air purifiers.
- Developed for extracting pure oil mists on cutting machines
- Pre-filtering of aerosols and liquid particles by the patented X-Cyclone® and agglomerator system
- Aerosols and particles measuring less than 1 µm are separated in the electrostatic collector.
- **All filter elements can be cleaned and reused – no disposable filters.**
- The base of the housing is an oil and water-tight collection tray.
- TÜV-tested fire screen in accordance with DIN EN 16282
- Appliances comply with an ozone limit of 0,2mg/m<sup>3</sup>
- Permissible ambient temperature 0°C to 40°C
- Stainless steel housing, powder-coated in RAL 7035 (light grey)
- other RAL colours available on request
- Supplied ready to plug in (Harting HAN 10) with integrated fan
- **Supplied with:** Electrostat, glass fibre agglomerator and X-Cyclone® filter insert
- **Pricing:** ex works, including packaging



Self-regulating separator



### Single unit

- **Filter system automatically regulates the motor output according to the degree of contamination of the separator. This guarantees that the volume flow, inflow velocity and separation efficiency remain the same until complete contamination (red status indicator).**
- Digital wear indicator

Model	Air quantity m <sup>3</sup> /h	Dimensions L x W x H mm	Connection Ø mm	Weight kg	Noise level dB	Number of collector cells	Motor output kW	I(A)	Tension V	Right-hand art.no.	€	Left-hand art.no.	€
SEF 1000	1000	1325 x 560 x 810	200	117	63	1	0.32	0.95	400	909120 1001	4.429,-	909125 1001	4.429,-
SEF 1000 D	1000	1540 x 560 x 810	200	143	63	2	0.32	0.95	400	909120 1002	5.949,-	909125 1002	5.949,-
SEF 1000 T	1000	1755 x 560 x 810	200	169	63	3	0.32	0.95	400	909120 1003	7.059,-	909125 1003	7.059,-
SEF 1700	1700	1375 x 525 x 900	200	121	65	1	0.59	1.53	400	909120 1701	7.079,-	909125 1701	7.079,-
SEF 1700 D	1700	1590 x 525 x 900	200	148	65	2	0.59	1.53	400	909120 1702	7.999,-	909125 1702	7.999,-
SEF 1700 T	1700	1800 x 525 x 900	200	175	65	3	0.59	1.53	400	909120 1703	8.529,-	909125 1703	8.529,-
SEF 2500	2500	1375 x 650 x 900	300	185	67	1	1.29	2.86	400	909120 2501	8.799,-	909125 2501	8.799,-
SEF 2500 D	2500	1590 x 650 x 900	300	190	67	2	1.29	2.86	400	909120 2502	11.439,-	909125 2502	11.439,-
SEF 2500 T	2500	1800 x 650 x 900	300	219	67	3	1.29	2.86	400	909120 2503	13.309,-	909125 2503	13.309,-

9155

9155





## SARA® Mobile smoke filter 3D

**Ideal for 3D printing**

- **Removal of smoke, vapour, odour and gas from exhaust air.**
- The fan is designed for energy-efficiency.
- Thorough air purification and air conditioning using gas filter for odour reduction, HEPA H13 high-performance particle and dust filter.
- Robust and torsion-free housing made of powder-coated stainless steel (RAL 7035 - light grey).
- The HEPA filter is equipped with a high-quality glass-fibre medium and has a large filtering surface.
- Suction arm with integrated stainless steel mechanics
- An intelligent monitoring system with electronic flow sensors guarantees the continuous function monitoring of the suction.
- The air flows indicated in the product description are achieved throughout the entire operating life.
- Designed, constructed and produced in Germany
- **Applications:** 3D printing, laser engraving, laser marking, laser cutting, wafer processing, eroding and soldering
- **Supplied with:** 3D smoke filter with two suction arms, gas filter, HEPA H13 high-performance particle filter, coarse particle filter
- **Pricing:** ex works, including packaging



### Single unit

Model	Volume flow max. m³/h	Suction arm	Dimensions L x W x H mm	Suction arm Ø mm	Weight kg	Noise level dB	Output W	I(A)	Tension V	art.no.	€
SMR-3D	500	2	400 x 400 x 622	70	33	≤ 50	168	1.4	230	<b>909111 0010</b>	<b>3.739,-</b>

9103

### Spare parts, consumables

Description	suitable for	art.no.	€
Active carbon gas filter	SMR-3D	<b>909151 0010</b>	<b>420,-</b>
HEPA H13 high-performance HEPA filter	SMR-3D	909151 0020	<b>435,-</b>
Coarse particle filter	SMR-3D	909151 0030	<b>234,-</b>
Suction arm Ø 70 mm	SMR-3D	909151 0040	<b>250,-</b>
Motor 0.157 kW	SMR-3D	909151 0050	<b>1.559,-</b>

9103



909151 0030



909151 0020



909151 0010



Perfect protection ...

... with grip.

**ATORN®**  
Performance demands quality



SARA®

# PROTECT YOUR EMPLOYEES FROM VIRUSES AND GERMS



In addition to following the well-known AHA rules (keep your distance, observe hygiene measures, wear a mask), the risk of infection can be reduced significantly by consistent ventilation and the proper use of air-conditioning systems. There are a large number of pollutants in the air that can lead to illness, poor concentration, allergic reactions and even serious disease. The compact SARA air purifier improves indoor air quality in a wide variety of areas:

## Air purifiers in the workplace

Clean, fresh air is a necessity when it comes to optimising performance and efficiency in the workplace. Operating a laser printer in the office, for example, can produce a particle concentration in the indoor air as high as that

caused by smoking. Scientists have found that the air pollution in an office building during working hours can be up to five times higher than that of the air outside next to a busy road.

## Air purifiers in the catering industry

Fine dust particles and kitchen odours can result in very poor air quality in hotels and restaurants. Guests feel more comfortable in a fresh ambience with clean air, making them want to stay longer.

## Air purifiers at home

Fungal spores, fine dust, germs, pollen and allergens reduce the air quality in our homes. Secure a sense of well-being for the whole family by ensuring the indoor air conditions in your home are

optimal and meet air purity standards.

## Air purifiers for allergies

The quality of life of asthmatics and allergy sufferers depends crucially on air purity. Airborne allergens such as pollen, mould spores, dog and cat dander, and dust mites can greatly affect the air quality for allergy sufferers.

## SARA® Indoor air filter UCS-OH<sup>2</sup>

- Compact air purifier to improve indoor air quality
- Elimination of fungal spores, fine dust, pollen, allergens and odour particles (e.g. cigarette smoke)
- **Reduction of airborne viruses (e.g. SARS-CoV-2)**
- **Filter stages:** ePM1 85% pre-filter, gas filter, HEPA® H13 high-performance particle and fine dust filter
- Separation efficiency of 99.95% in accordance with EN1822-1:2009 for particles > 0.3 µm
- Air output adjustable in 10 steps
- Sustainable air purification concept thanks to the use of cleanable separators and filters with very long service lives.
- Stainless steel housing, powder-coated in RAL 9005 (deep black)
- **Application area:** Offices, conference rooms, lounges and break rooms, canteens, hotel rooms, schools, nurseries, supermarkets and much more.
- Designed, constructed and produced in Germany
- **Supplied with:** Air purifier, EUREVEN® F2011 pre-filter, gas filter, HEPA H13 high-performance particle filter
- **Pricing:** ex works, including packaging

Reduces the risk of infection via airborne particles

NEW



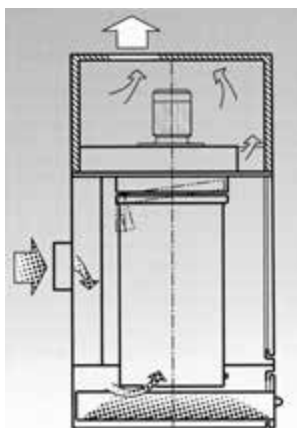
Model	Volume flow min. m³/h	Volume flow max. m³/h	Dimensions L x W x H mm	Weight kg	Noise level dB	Output kW	I(A)	Tension V	art.no.	€
UCS-OH <sup>2</sup>	0	500	455 x 400 x 690	30	0-50	168	1.4	230	909160 0001	2.599,-

9154

## SARA® SARA-PAC Power-Air-Cleaner dry dust filter system

- Separation system with air flow of 900 m<sup>3</sup>/h or 2000 m<sup>3</sup>/h
- For virtually all typical application problems in industrial and artisan manufacturing relating to the extraction of dry dust
- The basic unit is a pocket filtration device with polyester needle felt filter bags, which can be cleaned using either a vibrating roller or a pneumatic vibrator.
- Typical areas of application include the extraction of dust generated by polishing, cutting, sawing, milling as well as de-burring when machining metal, stone, wood and plastic
- Standard colour RAL 5007 (brilliant blue), other RAL colours available on request
- **Pricing:** ex works, including packaging

CE



Ill. shows SARA-PAC 20 with dust container and secondary filter

### Complete unit for stationary connection

Description	Volume flow max. m <sup>3</sup> /h	Width mm	Depth mm	Height mm	Connection Ø mm	Noise level dB	Weight kg	Motor output kW	Connection V	Current A	Contents, dust drawer l	art.no.	€
SARA-PAC 9 with dust drawer	900	550	650	1200	125	72	90	0.75	230/400	3.1 / 1.8	45	988102 0009	2.999,-
SARA-PAC 9 with dust container	900	550	650	2000	125	72	90	0.75	230/400	3.1 / 1.8	45	988102 1009	3.189,-
SARA-PAC 20 with dust drawer	2000	750	850	1650	200	75	220	2.2	230/400	8.1 / 4.7	120	988102 0020	3.929,-
SARA-PAC 20 with dust container	2000	750	850	2400	200	75	220	2.2	230/400	8.1 / 4.7	120	988102 1020	4.349,-

9108

### Accessories and consumables

Description	For SARA-PAC 9		For SARA-PAC 20	
	art.no.	€	art.no.	€
Chassis	988106 0001	380,-	988107 0001	559,-
Suction arm, DN 125 mm, or DN 200 mm length 3 m	988106 0002	1.409,-	988107 0002	1.599,-
Pneumatic filter cleaning	988106 0003	2.329,-	988107 0003	2.579,-
Secondary filter unit H13	988106 0004	1.609,-	988107 0004	2.669,-
Secondary filter unit, active carbon	988106 0005	1.609,-	988107 0005	2.669,-
Spare filter insert H13	988106 0006	719,-	988107 0006	1.429,-
Spare filter insert, active carbon	988106 0007	909,-	988107 0007	1.799,-
Spare filter bag, standard	988106 0008	255,-	988107 0008	410,-
Spare filter bag, anti-static	988106 0009	270,-	988107 0009	430,-
Spare filter bag, coated	988106 0010	355,-	988107 0010	460,-
Water pre-separator	988106 0011	2.669,-	988107 0011	4.899,-

9108

9108



## Installation accessories for filter systems



Pre-filter

### Pre-filter for liquids and rough particles

Description	art.no.	€
Pre-filter 150 mm	902050 1150	345,-
Pre-filter 200 mm	902050 1200	355,-
Pre-filter 300 mm	902050 1300	619,-
Filter insert, fine, 150 / 200 mm, white	902051 1520	10,80
Filter insert, fine, 300 mm, white	902051 0300	20,30
Filter insert, coarse, 150 / 200 mm, black	902052 1520	10,40
Filter insert, coarse, 300 mm, black	902052 0300	19,85

9102



Flange joint 90°

Flange joint

### Flange joint

Description	art.no.	€
Flange joint 75 mm	902053 0075	67,70
Flange joint 100 mm	902053 0100	67,70
Flange joint 150 mm	902053 0150	74,80
Flange joint 200 mm	902053 0200	86,50
Flange joint 300 mm	900150 0015	220,-
Flange joint 100 mm, 90° angled	900150 0018	235,-
Flange joint 150 mm, 90° angled	900150 0017	235,-
Flange joint 200 mm, 90° angled	900150 0016	235,-

9102



Suction hose

### Suction hose

Description	art.no.	€
Hose NW 75 mm, per metre	900150 0118	65,60
Hose NW 100 mm, per meter	902050 0001	34,70
Hose NW 125 mm, per metre	900150 0006	48,90
Hose NW 150 mm, per meter	900150 0002	56,50
Hose NW 200 mm, per meter	900150 0001	72,-
Hose NW 300 mm, per meter	900150 0014	103,-

9102



Hose clamp

### Hose clamp

Description	art.no.	€
Hose clamp 70-90 mm	900160 0001	3,85
Hose clamp 100-120 mm	900160 0002	4,44
Hose clamp 120-140 mm	900160 0003	4,75
Hose clamp 150-170 mm	900160 0004	5,55
Hose clamp 200-220 mm	900160 0005	6,85
Hose clamp 300-320 mm	900160 0006	9,20

9102



Reducer

### Reducer

Description	art.no.	€
Reducer: 100 mm to 75 mm	902055 1075	58,-
Reducer: 150 mm to 100 mm	902055 1510	61,60
Reducer: 200 mm to 100 mm	902055 2010	89,50
Reducer: 200 mm to 150 mm	902055 2015	89,50
Reducer 300 mm to 200 mm	902050 0016	95,50

9102



Y-connector

### Y-connector

Description	art.no.	€
Y-connector 100 mm to 2 x 100 mm	902058 0100	233,-
Y-connector 150 mm to 2 x 100 mm	902058 0150	395,-
Y-connector 200 mm to 2 x 100 mm	902058 0200	440,-
Y-connector 200 mm to 2 x 150 mm	902058 0201	425,-

9102



Inlet gasket

### Gasket for inlet opening

Description	suitable for	art.no.	€
Gasket 75 mm for inlet opening	S 200	902050 0062	40,20
Gasket 150 mm for inlet opening	S 400, S 800	902050 0063	50,80
Gasket 150 mm for inlet opening	FX4002	902050 0061	50,80
Gasket 200 mm for inlet opening	FX5002, FX6002, FX7002, Ultra-Eco compact	902050 0060	50,80

9102



Return hose

Hose connector

### Oil return

Description	suitable for	art.no.	€
Connection for oil return hose	SARA filter systems	909005 0004	49,40
Siphon	SARA filter systems	909005 0002	195,50
Oil return hose, per metre	All filter systems	902050 0005	10,70

9102



Air flow regulator

T-piece with air flow regulator

T-piece with two air flow regulators

**Air flow regulator**

Description	art.no.	€
Air flow regulator 100 mm	902057 0100	67,70
Air flow regulator 150 mm	902057 0150	79,90
Air flow regulator 200 mm	902057 0200	92,10
T-piece with air flow regulator 100 mm	902056 0100	132,50
T-piece with two air flow regulators 100 mm	902056 0102	233,-
T-piece with air flow regulator 150 mm	902056 0150	162,50
T-piece with two air flow regulators 150 mm	902056 0152	284,-
T-piece with air flow regulator 200 mm	902056 0200	216,-
T-piece with two air flow regulators 200 mm	902056 0202	430,-

9102



Fish-mouth nozzle

Universal holder for fish-mouth nozzles

**Fish-mouth nozzle**

Description	art.no.	€
Fish-mouth nozzle 100 mm, suction opening 210 x 95 mm	902059 0100	192,50
Fish-mouth nozzle 150 mm, suction opening 130 x 90 mm	902059 0150	192,50
Fish-mouth nozzle 150 mm, suction opening 265 x 120 mm	902059 0151	192,50
Fish-mouth nozzle 200 mm, suction opening 315 x 130 mm	902059 0200	192,50
Fish-mouth nozzle 200 mm, suction opening 340 x 150 mm	902059 0201	192,50
Universal holder for fish-mouth nozzles	902059 0001	188,50

9102



Stand for direct mounting

Ultra-Cleaner stands

Stand, extendible

**Stands, wall bracket**

Description	suitable for	art.no.	€
Stands 2000 mm	Ultra-Cleaner filter systems	909005 0009	649,-
Stand, extendible 1525-2740 mm	S400, S800	902050 0028	949,-
Stand, extendible 1525-2740 mm	FX4002, FX5002	902050 0023	949,-
Stand, extendible 1525-2740 mm	FX6002, FX7002	902050 0031	929,-
Upper stand section with rod	S400, S800	902050 0046	315,-
Upper stand section with rod	FX4002, FX5002	902050 0034	480,-
Upper stand section with rod	FX6002, FX7002	902050 0047	489,-
Stand for mounting directly on the machine	FX4002, FX5002	902050 0025	649,-
Stand for mounting directly on the machine	FX6002, FX7002	902050 0039	839,-
Wall bracket	S200, S400, S800	902050 0032	265,-
Wall bracket	FX4002, FX5002	902050 0036	370,-
Wall bracket	FX6002, FX7002	902050 0040	370,-

9102

**Suction hose Flexi 75**

- Flexible, pliable segment hose made of acetal copolymer
- Specially developed to extract chips, smoke, vapour, gas, lubricant mist and other media.
- **Outer diameter 75 mm**
- Individual hose segments can be joined to any desired length and combined with any nozzles and accessories.
- Can be accurately set-up with just one hand.



**Individual components**

Description	art.no.	€
Square nozzle 150 x 90 mm	900170 0150	8,45
Adapter for metal pipe	900170 0200	6,80
Slider valve	900170 0250	23,40
300 mm segment hose	900170 0300	24,10
Two 300 mm segment hoses	900170 0600	44,90

9104

**Sets**

- Each set contains segment hoses, adapter for metal pipe, slider valve and square nozzle 150 x 90 mm

L mm	art.no.	€
1000	900170 1000	94,10
2200	900170 2000	174,-
3100	900170 3000	234,-

9104



Precision extraction

900170 0150

900170 0200

900170 0250

900170 0300

900170 1000



**SARA® Filter fleece**

**INFO**



Save 30% on maintenance costs



No downtime



2 years' protection with one roll



No opening the switch cabinets



Replace in just 5 seconds



Protect valuable installations for just 5 cents



Prevent the spread of harmful particles



Visual check: filter is replaced in good time

**SARA® Filter fleece**

- Filter fleece to protect electrical and electronic equipment for industrial manufacturing plants and electric motors against oil mist and dust.
- Heavily contaminated filters can reduce the airflow and cause the device to overheat.
- The inspection for replacing the filter fleece is visual. If the filter is covered in impurities, it must be replaced.

**Filter fleece for switch cabinets**

- Each roll contains 110 sheets
- Sheet length 200mm
- Magnetic holder
- **Suitable for machine tools, cooling systems, control cabinets, robots, CNC machines**



**Up to 30 % savings in maintenance costs!**



Width mm	art.no.	€
200	991001 2012	44,80
300	991001 3012	78,90
400	991001 4006	91,10
500	991001 5006	104,-
600	991001 6006	115,-

9112

**Filter fleece for compressors**

- Each roll contains 60 sheets
- Sheet length 200mm
- **Other lengths up to 1500mm available on request**
- Magnetic holder
- **Suitable for compressors, heat exchangers, air-conditioning units**

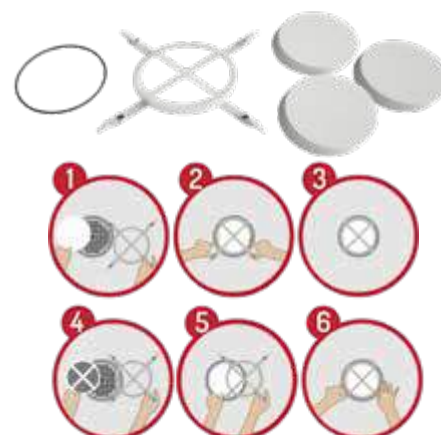


Width mm	art.no.	€
200	991003 2012	47,-
300	991003 3012	82,90
400	991003 4006	95,60
500	991003 5006	109,-
600	991003 6006	121,50

9112

**Filter fleece for electric motors**

- Suitable for electric motors
- **Supplied with:** 12 filter fleeces, 10 clamping rings, 1 plastic fastening system with magnet



Ø mm	art.no.	€
100	991005 1036	50,80
120	991005 1236	53,40
150	991005 1518	61,60
175	991005 1718	66,70
200	991005 2008	72,30
230	991005 2308	82,90
260	991005 2605	91,10
300	991005 3005	98,70

9112





**Ultrasonics**

Tiny imploding vacuum bubbles have an intense yet gentle cleaning effect.

**Temperature**

In most cases, the cleaning effect is greatly enhanced by heat.

**Classic fields of application**

Surface technology, optics, laboratory, mechanical and plant engineering, watch and jewellery technology, medicine, dental, hygiene, medical engineering, aviation, electronics, automobile industry, textile industry, food processing industry and much more besides

**Chemistry**

The right cleaning chemistry reduces surface tension and loosens and binds particles of dirt.

**Time**

The use of coordinated chemistry during ultrasonic cleaning significantly shortens the cleaning time.

The Sinner's Circle - the four influencing factors in the ultrasonic cleaning process

**Ultrasonic cleaning – one of the best procedures around today  
Ecological, economical, intense and gentle at the same time.**

**Ultrasonics shorten the cleaning time**

"Ultrasonics" is used to refer to vibrations above the range audible to the human ear (> 20 kHz). Vibrations of between 20 and 130 kHz are used for cleaning. Using vibrating elements attached to the tray shelf of a cleaning tray, underpressure and overpressure waves ripple through the liquid. From a particular vibration power



density, the liquid compound ruptures and tiny, nanometre-sized vacuum bubbles are created. These tiny bubbles implode near the surface of the cleaning agent and create a pressure jet directed at the surface. This process is known as cavitation. It ensures intense yet gentle removal of particles of dirt. This happens in all places covered with

liquid – in the narrowest of joints and blind holes too. Parts and inner areas which are particularly complicated from a geometric standpoint – including areas where spray jets or manual cleaning methods fall short – are thoroughly cleaned.



**Ultrasonic cleaning equipment with heating system Elmasonic EASY**



- contemporary design, with robust cleaning trays made of wear-resistant stainless steel
- Noise-reducing plastic cover with additional function as a drip tray (model S 900/H with stainless steel cover, no drip collector function)
- Nine different sizes with tray volume 0.8 to 28 litres
- Permanent **integrated sweep function** with 100% ultrasonic function at a frequency of 37 kHz
- **Switchable pulse function** to remove tough, mineral-based contaminants and polishing compounds. The ultrasonic effect is boosted up to 20% and the impurities can be removed quickly and easily.
- Warning when the individually adjustable temperature limit is reached to prevent albuminous contaminants hardening or sensitive parts becoming damaged.
- **Supplied with:** with cover and without basket
- **Pricing:** ex works, includes packaging



**Basic unit without cover and without basket**

Type	Dimensions W x D x H mm	Weight kg	Head output kW	Basket load kg	Basket interior dimensions mm	Basket meshes mm	Total power consumption W	Discharge diameter mm	Handles	Tray content l	art.no.	€
EASY 10/H	206 x 133 x 182	2.0	0/0.06	1	177 x 73 x 30	7x1	30	-	-	0.8	986011 1080	346,-
EASY 20/H	176 x 189 x 218	2.1	0/0.12	1	112 x 103 x 49	7x1	35	-	2	1.75	986011 0175	415,-
EASY 30/H	301 x 189 x 218	3.3	0/0.02	1	198 x 106 x 49	7x1	80	-	2	2.75	986011 0275	445,-
EASY 40/H	301 x 189 x 268	4.0	0/0.2	3	190 x 105 x 74	7x1	140	-	2	4.25	986011 1425	659,-
EASY 60/H	362 x 201 x 269	5.1	0/0.4	5	255 x 115 x 74	9x1	150	3/8	2	5.75	986011 1575	769,-
EASY 100/H	363 x 289 x 272	5.9	0/0.4	6	255 x 200 x 73	9x1	150	3/8	2	9.5	986011 1950	919,-
EASY 120/H	363 x 289 x 272	7.5	0/0.8	6	250 x 190 x 113	9x1	200	3/8	2	12.75	986011 1275	1.179,-
EASY 180/H	393 x 352 x 322	8.5	0/0.8	8	280 x 250 x 113	9x1	200	3/8	2	18	986011 1800	1.289,-
EASY 300/H	566 x 352 x 322	11.0	0/1.2	10	455 x 250 x 112	9x1	300	3/8	2	28	986011 2800	1.619,-

9154



## Elma Ultrasonic cleaning equipment with heating system Elmasonic S

- Contemporary design, with robust cleaning trays made of wear-resistant stainless steel
- Noise-reducing plastic cover with additional function as a drip tray (model S 900/H with stainless steel cover, no drip collector function)
- Eight different sizes with tray volume 0.8 to 90 litres
- All appliances with ultrasonic frequency 37 kHz, sweep and degas function
- Heating systems with temperature-controlled function (control range 30 °C - 80 °C, i.e. the cleaning process can be started manually immediately or when the specified temperature is reached)
- **Supplied** without cover or basket (S 10/H with cover)
- **Pricing:** ex works, including packaging



### Basic unit without cover and basket

Type	Dimensions W x D x H mm	Weight kg	Head output kW	Basket load kg	Basket interior dimensions mm	Basket meshes mm	Total power consumption W	Discharge diameter in	Handles	Ultrasound point performance W	Tray content l	art.no.	€
S 10/H with cover	206 x 133 x 182	2.0	0/0.06	1	177 x 73 x 30	7x1	30/90	-	-	240	0.8	<b>986012 1080</b>	<b>346,-</b>
S 30/H	300 x 179 x 214	3.3	0/0.2	1	198 x 106 x 50	7x1	80/280	3/8	2	320	2.75	986012 0275	<b>639,-</b>
S 40/H	300 x 179 x 264	4.0	0/0.2	3	190 x 105 x 75	7x1	140/340	3/8	2	500	4.25	986012 1425	<b>959,-</b>
S 60/H	365 x 186 x 264	5.1	0/0.4	5	255 x 115 x 75	9x1	150/550	3/8	2	600	5.75	986012 1575	<b>1.119,-</b>
S 100/H	365 x 287 x 264	5.9	0/0.4	6	255 x 200 x 75	9x1	150/550	3/8	2	600	9.5	986012 1950	<b>1.339,-</b>
S 180/H	390 x 340 x 321	8.5	0/0.8	8	280 x 250 x 115	9x1	200/1000	3/8	2	800	18	986012 1800	<b>1.879,-</b>
S 300/H	568 x 340 x 321	11.0	0/1.2	10	455 x 250 x 115	9x1	300/1500	3/8	2	1200	28	986012 2800	<b>2.339,-</b>
S 900/H	715 x 570 x 467	40	2	30	545 x 450 x 250	16x1.2	2800	1/2	4	3200	90	986012 9000	<b>4.739,-</b>

9154

## Elma Ultrasonic cleaning agent tec clean

- Highly efficient concentrates for preparation with water
- Application dose 1 - 10 % depending on cleaning agent

Description	Contents	art.no.	€
tec clean A3	2.5	<b>986010 0325</b>	<b>29,50</b>
tec clean A3	10	986010 0310	<b>79,40</b>
tec clean A4	2.5	986010 0425	<b>29,50</b>
tec clean A4	10	986010 0410	<b>79,40</b>
tec clean A5 powder	0.85	986010 0585	<b>22,40</b>
tec clean S1	2.5	986010 0125	<b>29,50</b>
tec clean S1	10	986010 0110	<b>80,40</b>
tec clean S2	2.5	986010 0225	<b>39,70</b>
tec clean S2	10	986010 0210	<b>107,-</b>

9154



	Main contaminant	Haupt-Main surfaces	Properties	pH value	Amount
<b>tec clean A3</b> Iron & high-grade steel cleaner	cutting oils, drawing grease, soot, cinders Check grinding, polishes, not for aluminium or light metals!	high-grade steel, steel and other iron-based materials, titanium and precious metals, cast iron, non-ferrous metal, brass, glass and quartz! alkaline	liquid, emulsifying contains silicates and phosphates,	12.0	3 - 6 %
<b>tec clean A4</b> All-purpose cleaner	Oils, grease, soot, coking cinders, dust, fingerprints	high-grade steel, steel, iron, cast iron, aluminium and light metals nickel, zinc, plastic, ceramic, glass, quartz, rubber	liquid, usually de-emulsifying contains silicates and phosphates, alkaline	13.4	1 - 5 %
<b>tec clean A5</b> power cleaner for iron and light metals	scaled and resinified oils and greases grinding and polishing agent, paint residues, wax	high-grade steel, steel, iron, cast iron, aluminium and light metals nickel, high-grade steel, steel, zinc	powdered, emulsifying contains silicates and phosphates, alkaline	11.5	1 - 4 %
<b>tec clean S1</b> weakly acidic cleaning agent	rust, limescale, oxidation layers (e.g. copper rust), greases, oils	non-ferrous metal, high-grade steel, aluminium and light metals, brass remove steel, plastic, glass, steel immediately after rust removal from bath and rinse with anti-corrosive agent!	liquid, emulsifying acidic	1.6	1 - 5 %
<b>tec clean S2</b> highly acidic cleaning agent	mineral contaminants such as limescale, rust and other oxides, strippable coverings	high-grade steel, steel, iron, cast iron, carbide, brass, nickel, non-ferrous and high-grade metals, remove steel, iron, cast iron immediately after rust removal and rinse with anti-corrosive agent!	liquid, emulsifying acidic	< 1.0	1 - 10 %

## Elma Accessories for ultrasonic cleaning equipment

### Cover

suitable for	art.no.	€
Type EASY 10/H, S 10/H	<b>986013</b> 1080	<b>13,75</b>
Type EASY 20/H	986013 0175	<b>18,85</b>
Type EASY 30/H, S 30/H	986013 0275	<b>21,40</b>
Type EASY 40/H, S 40/H	986013 1425	<b>21,40</b>
Type EASY 60/H, S 60/H	986013 1575	<b>26,50</b>
Type EASY 100/H, S 100/H	986013 1950	<b>34,60</b>
Type EASY 120/H, S 120/H	986013 1275	<b>34,60</b>
Type EASY 180/H, S 180/H	986013 1800	<b>36,70</b>
Type EASY 300/H, S 300/H	986013 2800	<b>42,80</b>
Type S 900/H	986013 9000	<b>142,50</b>
9154		



### Basket inserts

suitable for	art.no.	€
Type EASY 10/H, S 10/H	<b>986014</b> 1080	<b>36,70</b>
Type EASY 20/H	986014 0175	<b>40,70</b>
Type EASY 30/H, S 30/H	986014 0275	<b>46,80</b>
Type EASY 40/H, S 40/H	986014 1425	<b>52,90</b>
Type EASY 60/H, S 60/H	986014 1575	<b>66,20</b>
Type EASY 100/H, S 100/H	986014 1950	<b>142,50</b>
Type EASY 120/H, S 120/H	986014 1275	<b>142,50</b>
Type EASY 180/H, S 180/H	986014 1800	<b>163,-</b>
Type EASY 300/H, S 300/H	986014 2800	<b>183,50</b>
Type S 900/H	986014 9000	<b>385,-</b>
9154		



## SARA® Venturi cleaner table

- **Mobile cleaning table for parts and machinery**
- The pneumatic blow gun is continuously supplied with compressed air independently of the foot pedal so that the gun can also be used to clean the machine cabin.
- **Filterless operation, completely maintenance-free**
- **Stainless steel housing** with integrated transport castors
- Equipped with patented X-Cyclone® filter element to prevent aerosol discharge
- Quick connection to the existing pneumatic system
- Negative pressure nozzle for extracting solid particles and liquid mists
- Developed, designed and manufactured in conformity with the relevant EU directives
- Also available with integrated washing table on request
- **Supplied with:** Supplied ready for connection to quick-action pneumatic couplings, including pneumatic blow gun, Y connector, safety screen and operating manual
- **Pricing:** ex works, including packaging



Working height mm	H mm	B mm	T mm	Compressed air connection bar	Weight kg	Noise level dB	art.no.	€
900	1300	300	300	5 - 10	26	64 - 70	<b>908500</b> 0300	<b>1.709,-</b>
900	1300	400	500	5 - 10	40	64 - 70	908500 0400	<b>2.139,-</b>
900	1300	500	500	5 - 10	45	64 - 70	908500 0500	<b>2.189,-</b>
900	1300	1000	500	5 - 10	82	64 - 70	908500 1000	<b>3.729,-</b>

9111

**SARA® Bio-parts washing table Compact Clean****NEW**

- **Easily removes oil, grease and emulsion from tools, components and accessories**
- Protects employees and the environment
- 3-stage filter system located in the tank drain (coarse, fine and bag filters and magnet)
- Control box, contains all control and pump equipment
- Ergonomic design
- Easy transport by means of pallet truck or rail system with rollers (optional)
- Drainage device facilitates the exchange of liquid
- **No hazardous substances, no dangerous goods, no fire hazard**
- **Supplied with:** Bio-parts washing table, 5 x 20 ltr. Canister for BT100 bio-parts cleaner
- **Pricing:** ex works, including packaging

**Includes initial filling**

Device dimensions	Working height mm	Supported load kg	Work surface mm	Contents l	Min. operating temperature	Max. operating temperature	Material	Weight kg	Nominal voltage	art.no.	€
1060 x 940 x 600 mm	940 / 800	100	700 x 480	100	15	48	LDPE - Polyethylen	55	230	<b>987001 0010</b>	<b>2.029,-</b>

9154

**Accessories**

Designation	art.no.	€
Mobile set with stop/swivel castors	<b>987003 0010</b>	<b>203,-</b>
Protective base made from stainless steel perforated sheet	<b>987003 0020</b>	<b>172,-</b>

9154



987003 0010

987003 0020

**SARA® Bio-parts cleaning agent BT100****NEW**

- **First biological cleaner that can be used in all common manual and automatic parts cleaning systems – we are happy to help with optimisation**
- Microorganisms in the cleaner break down the removed oil
- Suitable for all common materials
- Ideal for any modern workshop
- **Non-hazardous, VOC reduction, NSF certification**
- Can be used in the Compact Clean bio-parts washer, parts washers and high-pressure parts washers
- **Application area:** Maintenance and servicing of machine parts, components, tools, etc.

**Easily removes oil, grease and emulsion**

Designation	Contents l	art.no.	€
bio-parts cleaner	20	<b>987002 0020</b>	<b>147,50</b>

9154

# Environmental technology info

**The Compact Clean bio-parts washing table is ideal for cleaning the components of filter systems, emulsion treatment trolleys or industrial vacuum cleaners.**





The SARA® cutting fluids product range is the latest generation of high-performance cutting fluids. These have been developed for high demands on product quality and manufacturing reliability in the machining process. Thanks to the latest technologies, the cutting fluids offer a long service life, high lubricating and cooling performance, and low consumption. In addition, they are particularly user-friendly thanks to their environmentally friendly ingredients.

**Advantages**

- Very good lubricating and cooling performance
- Low consumption and low odour
- For a long machine service life
- Low foaming in soft water or under high mechanical load
- Biostable against microorganisms
- High user-friendliness thanks to environmentally friendly ingredients (formaldehyde-free)



**Product overview/selection guide**

	Ingredients				Materials											Machining				
	Contains boron	Contains amines	Contains form aldehyde	Mineral oil content in %	Steel	Stainless steel	Cast iron	Titanium alloys	Super alloys Fe/NiCo-based	Aluminium	Non-ferrous metals	Non-ferrous metals	Carbide metals	Plastics	Drilling, milling, turning	Threads	Deep-hole drilling	Grinding	Punching	
<b>Water-miscible cutting fluids</b>																				
UNI SC 101	●	●		35	●	○	●			○	○			○	●	●	○	○		
HEAVY SC 201				50	●	●	●	●	●	●	●	●		○	●	●	●	○		
HPC SC 301	●	●		0	●	●	●			●	●	●		○	●	●	●	●		
HI-GRIND SC 401		●		0	●	○	●			○	○			○				●		
<b>Cutting oils</b>																				
UNI SC C0101				80	●	○	●			●	●	●		○	●	●	●	○	●	
HEAVY SC C0201				0	●	●	●	●	●	●	●	●		○	●	●	●	○	●	
UNI VISC SC C0301				91	●	○	○			●	○		○	○	●	●	●	○	●	

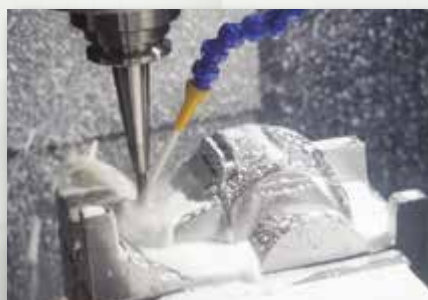
● very well suited ○ well suited

# Environmental technology info

**Other lubricants available on request:**

- Cutting fluid additives
- Hydraulic oils
- Track oils
- Industrial oils
- Corrosion protection
- Greases
- Industrial cleaners

**E-mail: christian.cohrs@sartorius-werkzeuge.de**

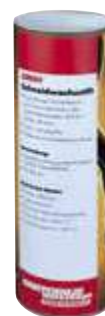


**SARA® Cutting wax pen**

- **Universal high-performance mineral oil-based cutting wax pen**
- Excellent lubricating properties ensure optimum machining results while also increasing tool service life.
- Ideal for easy and targeted application on the tool cutting edge
- Can be used for sawing with circular saw blades, band saws and thread cutting
- Economical to use, very good adhesive properties
- **Chlorine, silicone and solvent-free**

Description	Contents g	art.no.	€
Lubrication pin	400	<b>946001 0400</b>	<b>12,30</b>

9156



946001 0400

**SARA® Thread-cutting paste****Soft thread-cutting paste**

- **Universal high-performance water/soap-based thread cutting paste**
- Semi-pasty grease
- Latest generation multi-purpose cutting paste
- For universal applications, also for difficult-to-machine materials such as stainless and heat-resistant steels, titanium, manganese, cast steel, chrome-nickel, etc.
- Ideally suited to thread cutting, centring, broaching and milling
- Medium is applied directly from the squeeze bottle onto the metal surface in need of treatment.
- Light blue colour, odourless
- Flash point > 225 °C, melting point 32 °C
- **Free of petroleum, chlorine and sulphur**
- **Not a hazardous substance**

Description	Contents l	art.no.	€
Wash bottle	0.1	<b>946002 0100</b>	<b>6,40</b>
Wash bottle	0.25	946002 0250	11,75
Wash bottle	0.5	946002 0500	21,90
Wash bottle	1.0	946002 1000	32,70
Canister	5.0	946002 0005	136,-

9156



946002 0005

**Firm thread-cutting paste**

- **Universal high-performance thread cutting paste**
- Excellent lubricating properties ensure optimum machining results while also increasing tool service life
- For thread cutting, milling, reaming, etc.
- Ideal for easy and targeted dipping of cutting tools
- Especially for machining difficult-to-machine materials such as stainless and heat-resistant steels, titanium, manganese, cast steel, chrome-nickel, etc.
- Economical to use, very good adhesive properties
- **Chlorine-free**
- **Not a hazardous substance**

Description	Contents g	art.no.	€
Metal tin	120	<b>946003 0100</b>	<b>9,65</b>
Metal tin	750	946003 0250	26,70

9156



**SARA® Cutting oil****NEW**• **Non-water-soluble heavy-duty cutting oil****UNI SC CO 101**

- **Mineral oil-based**
- Universal application for all materials such as alloyed and unalloyed steels, cast iron, non-ferrous metals and aluminium
- Applied with a squeeze bottle, sprayer or lubricating device
- Massive increase in tool endurance
- **Chlorine-free**

Description	Contents l	art.no.	€
Wash bottle	0.25	<b>944001</b> 0250	<b>8,25</b>
Wash bottle	0.5	944001 0500	12,15
Wash bottle	1.0	944001 1000	22,-
Canister	5.0	944001 0005	87,20
Canister	10.0	944001 0010	151,-
Canister	25.0	944001 0025	307,-

9156



**MQL minimum volume  
lubrication suitable**

**HEAVY SC CO201**

- **Ester-based**
- Especially for machining chrome-nickel, titanium, manganese, copper and its alloys, high-alloy and stainless steels.
- **Chlorine and mineral oil-free**

Description	Contents l	art.no.	€
Wash bottle	0.25	<b>944002</b> 0250	<b>9,10</b>
Wash bottle	0.5	944002 0500	16,60
Wash bottle	1.0	944002 1000	30,-
Canister	5.0	944002 0005	119,-
Canister	10.0	944002 0010	206,-
Canister	25.0	944002 0025	420,-

9156

**Ideal for thread  
cutting**

**UNI VISC SC CO301**

- **Viscous**
- **Mineral oil-based**
- Universal for all materials
- Very good adhesive properties
- The cutting oil can be applied to the workpiece and tool by dipping, spraying, by roller or by hand.
- High lubricating performance
- Remaining oil film serves as corrosion protection
- **Chlorine-free**

Description	Contents l	art.no.	€
Wash bottle	0.25	<b>944004</b> 0250	<b>9,10</b>
Wash bottle	0.5	944004 0500	16,60
Wash bottle	1.0	944004 1000	30,-
Canister	5.0	944004 0005	119,-
Canister	10.0	944004 0010	206,-
Canister	25.0	944004 0025	420,-

9156



**SARA® High-performance lubricating coolant concentrate****NEW**• **Water-miscible****UNI SC101**

- With high additivation
- Universal for all materials
- Suitable for internal coolant supply and high pressure
- **Chlorine and formaldehyde-free**
- Application concentration 3 - 5%
- pH value at 5% concentration approx. 9.2
- Refractometer reading 1.4

Description	Contents 	art.no.	€
Canister	5.0	<b>943001 0005</b>	<b>68,50</b>
Canister	10.0	943001 0010	128,-
Canister	25.0	943001 0025	219,-
Canister	60.0	943001 0060	519,-
barrel	215.0	943001 0200	1.599,-
9156			

**HEAVY SC201**

- Especially for difficult-to-machine and high-strength materials, difficult aluminium alloys and non-ferrous metals
- **Free from chlorine, boric acid, amines and formaldehyde**
- Application concentration 5 - 9%
- pH value at 5% concentration approx. 8.5
- Refractometer reading 1.0

Description	Contents 	art.no.	€
Canister	5.0	<b>943002 0005</b>	<b>76,10</b>
Canister	10.0	943002 0010	139,50
Canister	25.0	943002 0025	238,-
Canister	60.0	943002 0060	549,-
barrel	215.0	943002 0200	1.719,-
9156			

**HPC SC301**

- **Ester-based**
- Especially for high-performance machining (HPC)
- Suitable for internal coolant supply and high pressure
- **Free from secondary amines, chlorine, mineral oil and formaldehyde**
- Application concentration 5 - 9%
- pH value at 5% concentration approx. 8.9 - 9.3
- Refractometer reading 1.56

Description	Contents 	art.no.	€
Canister	5.0	<b>943003 0005</b>	<b>77,10</b>
Canister	10.0	943003 0010	143,50
Canister	25.0	943003 0025	245,-
Canister	60.0	943003 0060	569,-
barrel	215.0	943003 0200	1.779,-
9156			

**HI-GRIND SC401**

- **Synthetic**
- Transparent
- Excellent rinsability, prevents smearing on tool surfaces
- High and stable corrosion protection
- **Free from chlorine, silicone, formaldehyde and boric acid**
- Application concentration 3 - 5%
- pH value at 5% concentration approx. 9.1
- Refractometer reading 2.75

Description	Contents 	art.no.	€
Canister	5.0	<b>943004 0005</b>	<b>77,10</b>
Canister	10.0	943004 0010	143,50
Canister	25.0	943004 0025	245,-
Canister	60.0	943004 0060	569,-
barrel	215.0	943004 0200	1.779,-
9156			

**Particularly suitable for  
NC and CNC centres**



**Specially for grinding a wide  
range of materials**

**SARA® System cleaner****NEW**

- **High-performance cleaning agent with corrosion protection**
- For quick and careful removal of contamination caused by microorganism infestation on machine tools and in coolant tanks and lines



Description	Contents l	art.no.	€
Canister	10.0	<b>945001 0010</b>	<b>139,50</b>
9156			

**SARA® Glass and window cleaner HI-CLEAN Performance****NEW**

- **For internal and external cleaning of viewing panels on machine tools and machining centres**
- Removes hardened cutting fluid
- Cleaning without foaming when in contact with cutting fluids.
- Contains no corrosion inhibitors, 100% surfactant-free
- Fast and residue-free drying
- **Non-hazardous**



945002 1000

Description	Contents l	art.no.	€
Pump spray bottle	0.5	<b>945002 0500</b>	<b>12,60</b>
Pump spray bottle	1.0	945002 1000	<b>22,50</b>
Canister	5.0	945002 0005	<b>98,50</b>
Canister	10.0	945002 0010	<b>163,-</b>
9156			

**Multi-purpose pump**

- Handy pump for diesel, heating oil, hydraulic oil and motor oil
- For 200 l barrels
- 1 m plastic hose with outlet nozzle
- Intake pipe
- Flow rate 0.4 l/stroke



Description	art.no.	€
Multi-purpose pump (lever-operated cylinder pump), 0.4 l/stroke	<b>742004 0001</b>	<b>117,-</b>
7125		

**ARIANA Filling level display**

- For commercially available 60 and 210 l containers
- For non-corrosive fluids such as cutting fluid concentrates, emulsions, oils, antifreeze, heating oil etc. as well as liquid media
- Permanent volume display
- Fitted on 3/4 inch opening, leaving 2" bung opening free



Description	art.no.	€
Filling level display	<b>742039 0001</b>	<b>61,-</b>
7138		



## SARA® Canister and barrel mixer

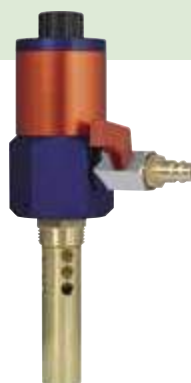
- Mixer for all container sizes
- Easy to handle
- Precise metering ensures economical use of emulsions
- An appropriate mixture ratio can be adjusted precisely using the needle valve
- The concentration should be checked using a hand-held refractometer
- The device operates on the Venturi principle
- All water-soluble concentrates can be mixed
- Can be attached without difficulty to 5, 10, 25, 60 and 200 l containers
- **Delivery includes:** 3 inlet pipes, adapter set for drums and canisters, and two connection hoses



Description	art.no.	€
Canister and barrel mixer	907056 0001	430,-
	9122	

## SARA® Pneumatic drum pump

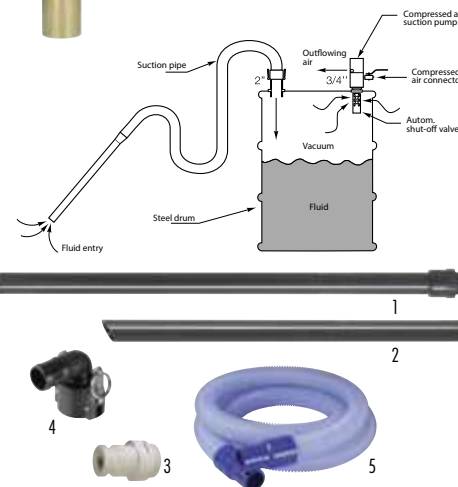
- Pneumatic dual-function suction and pressure pump
- For filling and emptying lubricant and coolant containers
- Used coolant, sludge and small metallic residue is sucked into a steel drum by vacuum
- Simply rotating the knob creates overpressure and the drum can be emptied
- Simply screw the pump into the bung hole (3/4") and the suction hose into the second bung hole (2") of a standard steel drum
- Required pressure approx. 6 - 8 bar
- Filling and emptying of approx. 60 l/min
- Automatic closing valve prevents overflowing
- **Caution:** Do not use the pneumatic pump for highly inflammable or explosive liquids. The steel drum must be undamaged and airtight.
- **Supplied with** approx. 3 m suction hose, coupling, inlet pipe and adapter



Description	art.no.	€
Compressed air drum pump, stainless steel, 3/4 inch	931004 0001	470,-
	9110	

### Spare parts

Description	Colour	Illustration	art.no.	€
Riser 815 mm	Grey	1	931005 0005	25,60
Intake pipe	Grey	2	931005 0003	25,60
Adapter	Grey	3	931005 0004	108,-
Coupling	Black	4	931005 0001	108,-
Hose, 3 m	Blue	5	931005 0002	54,50
			9110	



## SARA® Overflow protection sirens

- **To monitor the maximum or minimum fill level**
- Acoustic fill level control on your machine tool
- No excess hall cleaning due to container overflowing
- Easy attachment thanks to magnetic plate
- **Delivery includes:** Siren with magnetic foot and 1x 9 volt monoblock battery



Description	art.no.	€
Overflow protection sirens	906011 0001	114,50
	9120	

## Hand-held refractometer

- **Measurement range 0 - 32 %**
- The hand-held refractometer enables the cutting fluid concentration to be checked quickly. As a result, it is possible to use these fluids at the optimum concentration.
- Better utilisation of machine tools
- Longer tool service life
- Avoids rust caused by excessively diluted emulsions
- Allows the emulsion concentration to be varied during operation according to requirements (complies with TRGS 611)
- Reduced costs
- The scale of the hand-held refractometer is in percent and is easy to read
- **Supplied** with protective bag and pipette



Description	art.no.	€
Hand-held refractometer, analogue	907050 0001	102,-
	9122	

## Digital hand-held refractometer

- **Measurement range 0 - 70 %**
- **Ideal for users who wear glasses**
- For checking the emulsions in cutting fluids
- Solution 0.1 % (Brix)
- Accuracy +0.2 % (Brix)
- Digital temperature range 0 - 95 °C
- Automatic temperature correction
- Battery operation
- Auto-off function
- **Supplied** with battery, pipette, operating manual, plastic case



L mm	B mm	H mm	art.no.	€
105	55	30	907062 0001	420,-
			9122	

## Emulsion treatment case

- **For all measurements in accordance with TRGS 611**
- Thermometer for determining the specimen temperature
- Plastic beaker for specimen collection
- Empty bottles for sample collection, 3 units
- Nitrite test strips, 100 units, nitrate test strips, 100 units, total hardness test strips, 100 units, pH test strips, 100 units
- **Delivery includes:** Supplied with instructions on cutting fluid maintenance, TRGS 611 requirements, cutting fluid maintenance plan, and plastic case with recess for storing a hand-held refractometer



Description	art.no.	€
Emulsion treatment case	907020 0001	202,-
	9122	

## Replacement parts

Description	art.no.	€
Set of pH, nitrite, nitrate and total hardness test strips, 100 of each	907021 0001	111,-
pH test strips 100 units	907021 0002	22,30
Nitrite test strips 100 units	907021 0003	38,60
Nitrate test strips 100 units	907021 0004	38,60
Total hardness test strips 100 units	907021 0005	38,60
	9122	



## KÜMI coolant supply system

- Adjustable coolant hose, comprising individual plastic elements
- For use on all machine tools
- Replacement for conventional systems, plastic elements can be flexibly adjusted which allows coolant to reach any desired position
- Non-conducting and resistant to most chemicals and solvents
- Also suitable for blowing out workpieces, clamping equipment and machine tables
- Complete systems with magnetic anchoring bases and individual elements allow for a large number of possible combinations
- Operating pressure max. 6 bar
- **Operating pressure up to max. 60 bar is possible by attaching band clamps**  
**7630104001 or 7630204001**
- Compatible with the following systems: FLEXOLINE, OSSMANN, LOC-LINE, HYDRA, SNAPLOC, LUBE-COOL, VARIO, MAXIFLEXI
- Systems benefit from closer-fitting modules. This improves their ability to withstand higher pressures and ensures that the fluid stream remains directionally stable.



### 1/4" sets

Contents	art.no.	€
Articulated hose (16 modules), round nozzle ID 6.4 mm, threaded connector 1/4 inch, metal ball valve IT-ET 1/4 inch, round magnetic foot 2 IT 90°, threaded nozzle 1/4 inch for 13 mm fabric hose	<b>763010 0000</b>	<b>96,70</b>
Articulated hose (2 x 13 modules), 2 flat nozzles, 24 mm Y-distributor, threaded connector 1/4 inch, metal ball valve IT-ET 1/4 inch, round magnetic foot 2 IT 90°, threaded nozzle 1/4 inch for 13 mm fabric hose	763010 1000	127,50
Articulated hose set 1/4 inch, articulated hose (2 x 10 modules), 3 round nozzles ID 1.6 / 3.2 / 6.4 mm, 2 threaded connectors 1/4 inch + 1/8 inch NPT	763010 0001	12,20
Articulated hose (2 x 10 modules), approx. 31 cm long	763010 0002	10,15

7147

### 1/4" nozzles

Contents	art.no.	€
4 round nozzles, ID = 1.6 mm	<b>763010 1001</b>	<b>8,40</b>
4 round nozzles, ID = 3.2 mm	763010 1002	8,40
4 round nozzles, ID = 6.4 mm	763010 1003	8,40
2 flat nozzles, 24 mm wide	763010 1021	8,40
2 flat nozzles, 30 mm wide	763010 1022	14,25

7147

### 1/4" other accessories

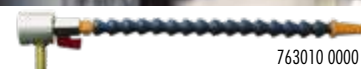
Contents	art.no.	€
4 threaded connectors, 1/8 inch NPT	<b>763010 1011</b>	<b>8,40</b>
4 threaded connectors, 1/4 inch NPT	763010 1012	8,40
2 Y-distributors	763010 1031	8,40
2 elbow connectors, 90°	763010 1051	8,40
2 T-distributors	763010 1061	13,15
2 shut-off valves, for articulated hose	763010 1071	16,20
2 shut-off valves for articulated hose 1/4 inch	763010 1081	16,20
2 shut-off valves, external thread 1/4 inch NPT	763010 1091	16,20
1 triple holder for T-distributor 1/4 inch	763010 2003	12,75
1 magnetic foot with ball valve (internal thread 1/4 inch) and threaded nozzle for 13 mm fabric hose	763010 2004	35,20
1 monoblock distributor 4 outlets 1/4 inch and IT 3/8 inch	763010 2005	50,40
2 band clamps 1/4 inch for retroactive fixing up to 60 bar	763010 4001	5,60

7147

### 1/4" assembly pliers

Contents	art.no.	€
1 pair of assembly pliers for attaching and releasing joint components 1/4 inch	<b>763010 3014</b>	<b>29,50</b>

7147



763010 0000



763010 1000



763010 0001



763010 0002



763010 1001

763010 1002



763010 1003

763010 1021



763010 1011

763010 1031

763010 1061

763010 1071

763010 1081

763010 1091

763010 2003

763010 2004

763010 2005



763010 3014



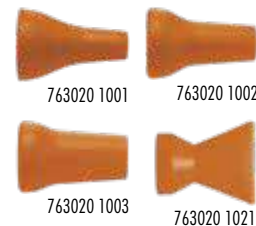
**1/2" sets**

Contents	art.no.	€
Articulated hose (2 x 5 modules), 2 round nozzles ID 9.5 / 12.7 mm, 2 threaded connectors 3/8 inch+1/2 inch NPT	763020 0001	18,15
Articulated hose (2 x 5 modules) approx. 29 cm long	763020 0002	13,50
7147		



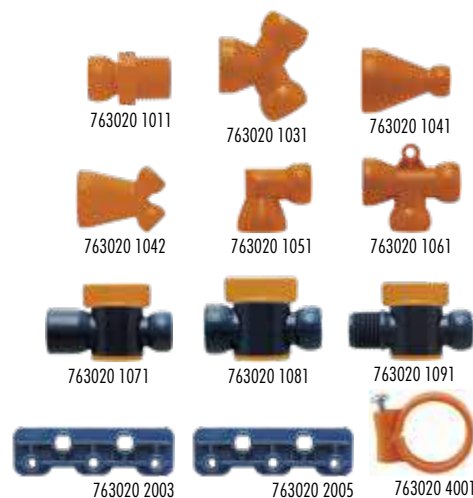
**1/2" nozzles**

Contents	art.no.	€
4 round nozzles, ID = 6.4 mm	763020 1001	10,80
4 round nozzles, ID = 9.5 mm	763020 1002	10,80
4 round nozzles, ID = 12.7 mm	763020 1003	10,80
2 flat nozzles, 32 mm wide	763020 1021	10,80
2 flat nozzles, 50 mm wide	763020 1022	17,90
7147		



**1/2" other accessories**

Contents	art.no.	€
4 threaded connectors, 1/2 inch NPT	763020 1011	10,80
4 threaded connectors, 3/8 inch NPT	763020 1012	10,80
2 Y-distributors	763020 1031	10,80
2 reducers, 1/2 inch to 1/4 inch	763020 1041	10,80
2 Y-reducers, 1/2 inch to 2x 1/4 inch	763020 1042	10,80
2 elbow connectors, 90°	763020 1051	10,80
2 T-distributors	763020 1061	10,80
2 shut-off valves, internal thread 1/2 inch	763020 1071	25,40
2 shut-off valves for articulated hose 1/2 inch	763020 1081	25,40
2 shut-off valves, external thread 1/2 inch NPT	763020 1091	25,40
1 triple holder for T-distributor 1/2 inch	763020 2003	10,80
1 monoblock distributor 4 outlets 1/2 inch and IT 3/8 inch	763020 2005	62,60
2 band clamps 1/2 inch for retroactive fixing up to 60 bar	763020 4001	6,45
7147		



**1/2" assembly pliers**

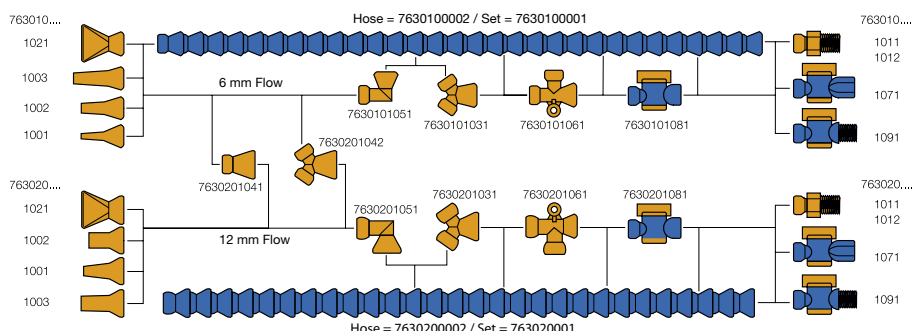
Contents	art.no.	€
1 pair of assembly pliers for attaching and releasing joint components 1/2 inch	763020 3012	29,50
7147		



**Sets**

- 18-pcs.
- 1/4" or 1/2"
- Case with foam inlay

Contents	art.no.	€
6 hose modules, 1 pair of assembly pliers, 1 Y-distributor, 1 shut-off valve, 3 flat nozzles: 16-hole / 32 mm / 27 mm, 3 round nozzles: Ø 1.6 / 3.2 / 6.4 mm, 2 threaded connectors 1/4 inch and 1/8 inch, 1 non-return valve 1/4 inch	763025 1814	129,-
6 hose modules, 1 pair of assembly pliers, 1 Y-distributor, 1 shut-off valve, 3 flat nozzles: 8-hole / 50 mm / 35 mm, 3 round nozzles: Ø 6.4 / 9.5 / 12.7 mm, 2 threaded connectors 3/8 inch and 1/2 inch, 1 non-return valve 1/2 inch	763025 1812	140,-
7147		



## SARA® Coolant high-pressure nozzles

- Compact high-pressure nozzles for up to 90 bar coolant pressure
- Nozzles can be installed in each assembly, saving space
- Nozzle setting angle of 60° to 110°
- Nozzle can be rotated 360°
- Casing made of high-quality plastic granulate
- Additional versions available on request



### 1/4"

Ø mm	Length of spray pipe mm	art.no.	€
2	1	<b>764002 3005</b>	<b>30,30</b>
2	6	764002 3006	30,30
2	12.5	764002 3007	30,30
2	31	764002 3008	30,30
7160			

### 1/8"

Ø mm	Length of spray pipe mm	art.no.	€
2	1	<b>764002 3001</b>	<b>29,10</b>
2	6	764002 3002	29,10
2	12.5	764002 3003	29,10
2	31	764002 3004	29,10
7160			



## AVNOGA Coolant spray system MINI-COOL

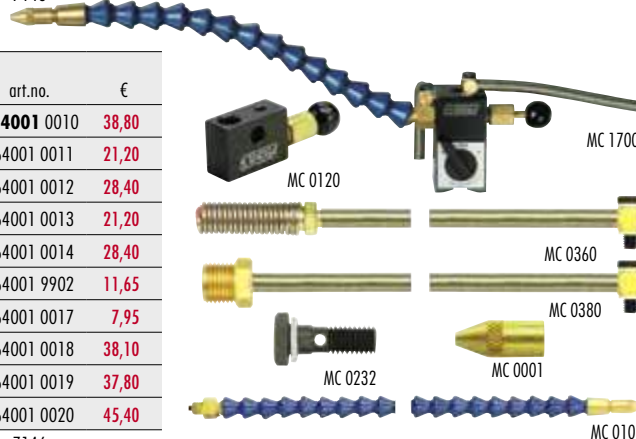
- For optimum and economical coolant distribution
- Pinpoint-accurate coolant supply for greater endurance
- Strong magnetic base
- Separate on/off switch
- Non-rusting nozzles and connection siphons
- Articulated arm = KÜMI hose



### Set

Model	Description	art.no.	€
MC 1700	Complete system (264 mm) with magnetic foot, on/off switch for air and coolant, air supply hose (1 m), coolant supply hoses (1 m)	<b>764001 0001</b>	<b>165,-</b>
MC 1800	Complete system (334 mm) with magnetic foot, on/off switch for air and coolant, air supply hose (1 m), coolant supply hoses (1 m)	764001 0002	169,-
MC 2000	Complete system (479 mm) with magnetic foot, on/off switch for air and coolant, air supply hose (1 m), coolant supply hoses (1 m)	764001 0003	174,-
MC 3200	Complete system (2x479 mm) with magnetic foot, on/off switch for air and coolant, air supply hose (1 m), coolant supply hoses (1 m)	764001 0006	290,-

7146



### Accessories

Model	Description	art.no.	€
MC 0120	Adjustment nozzle	<b>764001 0010</b>	<b>38,80</b>
MC 0360	Siphon hose, 1 m	764001 0011	21,20
MC 0311	Siphon hose, 2 m	764001 0012	28,40
MC 0380	Air hose, 1 m	764001 0013	21,20
MC 0302	Air hose, 2 m	764001 0014	28,40
MC 0232	Banjo screw incl. ring gasket	764001 9902	11,65
MC 0001	Nozzle	764001 0017	7,95
MC 0101	Articulated hose, 14 elements with nozzle and connection	764001 0018	38,10
MC 0102	Articulated hose, 19 elements with nozzle and connection	764001 0019	37,80
MC 0103	Articulated hose, 29 elements with nozzle and connection	764001 0020	45,40

7146

## NOGA COBRA 2000 coolant spray system

- For optimum and economical drop or spray delivery of coolants and emulsions
- Drop or spray supply can be either manual or automatic
- Straightforward connection to compressed air supply (3 - 9 bar)

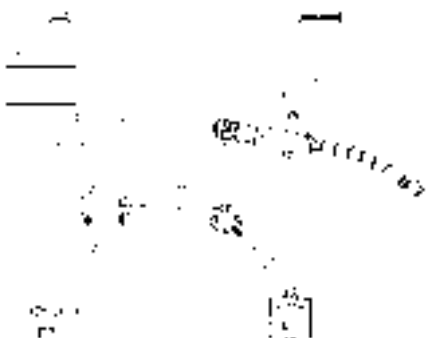
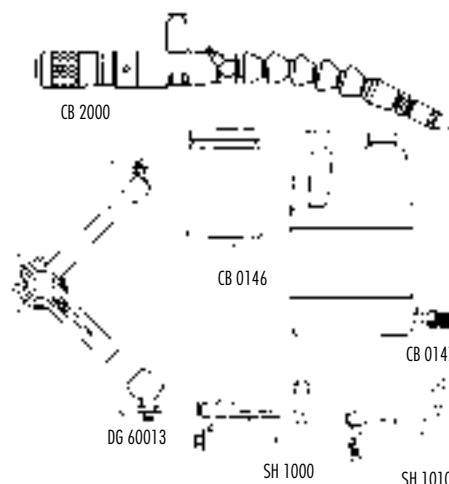
### Set

Model	Description	art.no.	€
CB 2100	Standard set: base unit CB 2000, articulated arm DG 61003 with magnetic foot SH 1000, plastic container 0.35 litres CB 0146	<b>765001 0002</b>	<b>669,-</b>
			7146



### Accessories

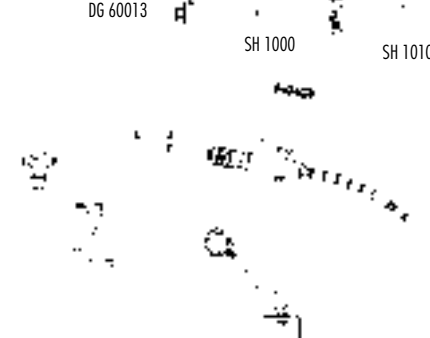
Model	Description	art.no.	€
CB 2000	Spray unit	<b>765001 0001</b>	<b>214,-</b>
CB 0146	Plastic container, 0.35 litres	765003 0001	38,10
CB 0147	Plastic container, 3.5 litres	765003 0002	63,60
SH 1000	Pump, mechanical	765003 0003	125,50
SH 1010	Mechanical valve	765003 0004	224,-
DG 60013	Articulated arm	765003 0010	116,-
			7146



Use with mechanical pump or automatic pulse generator for drop lubrication



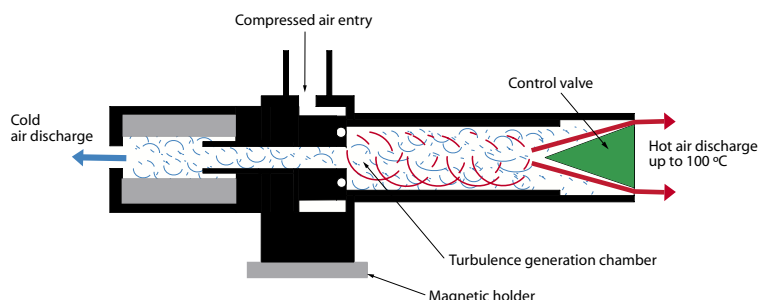
Used for constant drop or fine-spray lubrication



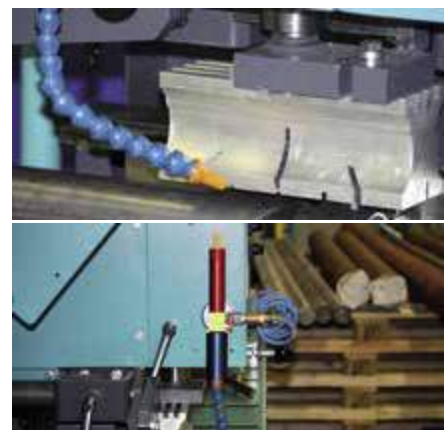
Used for fine-spray lubrication

## SARA® Pneumatic cold air nozzle

- Localised cooling for machine tools
- Dual function: both hot and cold air
- Ideal for use when no lubricating or coolant are desired
- Simple compressed air connection (3 - 8 bar)
- **Operates based on the principle of a vortex tube in which two counter-rotating air flows are created**
- Cold air outlet in the blue component (down to -48 °C)
- Hot air outlet in the red component (up to 100 °C)
- Air consumption at 7 - 8 bar approx. 270 l/min
- Supplied with magnetic base, spherical valve, connection for 3/8 inch quick-action pneumatic coupling, silencer, 1/2 inch articulated hose with round nozzle



Hose connector Ø in	Compressed air connection in	art.no.	€
1/2"	3/8"	<b>763030 0001</b>	<b>430,-</b>
			7123



## Emulsion treatment

**INFO**

Cutting fluid on wet-cutting machine tools is subject to heavy contamination. Hydraulic oils, track oils and greases that are introduced into the system are deposited on the emulsion surface and, at high concentrations, prevent the vital exchange of oxygen. When this mixes with floating and deposited solids, it forms the ideal breeding ground for bacteria and fungi, causing the cutting fluid to break down.

**SARA emulsion treatment systems** vacuum off a mixture of oils and solids from the emulsion surface. This mixture is separated in the maintenance system; the cleaned emulsion is then returned to the tool machine and the separated oil is fed into a separate container for disposal.

The emulsion and oil are separated using a gentle method which relies entirely on physics so as to avoid negative impacts on the emulsion as the result of centrifuging or similar. Separates up to 97% of floating and swirling tramp oils.

### Application areas

- Lathes
- Milling machines
- Grinding machines
- Parts washers
- Quenching tanks

### Advantages

- Removes tramp oils and solids simultaneously
- Works automatically in bypass mode, without the need for personnel
- No machine downtimes
- Prevents odour formation and eliminates risk of infection
- Extends the service life of lubricants and tools
- **Up to 50% savings in disposal costs!**



The oil collects on the surface of the resting basin (middle chamber).



Changing the water level allows the collected oil to be drained off into the collection tank via a rounded edge.

As the oil drains off, the surface begins to clear. As soon as all impurities have been removed from the surface, the water level can be lowered again.

## SARA® Emulsion maintenance station

- **Stationary/mobile treatment station for removing foreign oils from the cooling lubricant**
- **Emulsion treatment without staff intervention and no machine downtime (bypass procedure)**
- Robust, fully-welded stainless steel housing with oil-resistant outside coating
- Examples of use include machine tools, parts washers
- **Supplied with:** EPS, suction and return hose,
- **Pricing:** ex works, including packaging



Model	Transport quantity l/h	Dimensions L x W x H mm	Weight kg	art.no.	€
EPS 350	80 - 350	270 x 152 x 440	15	903001 0001	2.089,-

9115



## SARA® Emulsion maintenance cart

- **Mobile cart for removing large volumes of tramp oil**
- **Emulsion treatment without staff intervention and no machine downtime (bypass procedure)**
- Coarse particle removal through integrated pre-filter (standard filter 100 µm)
- Reduced risk of allergic reactions, skin disorders and unpleasant smells
- Liquid temperature max. 50 °C
- Overflow protection for safe automatic operation
- Long-lift high-performance eccentric spiral pump
- Maintenance-free AC motor, 0.37 kW, 230 V connection
- Robust, fully-welded stainless steel housing with oil-resistant outside coating
- **Supplied with:** Treatment cart, float, suction and return hose, 100 µm filter insert
- **Pricing:** ex works, including packaging

**No personnel required for tramp oil removal - bypass process**



View from above



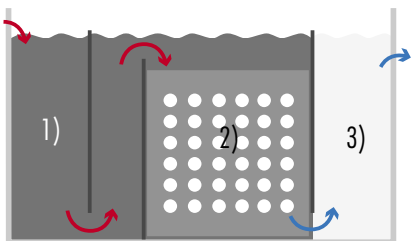
Tramp oil is drained into a tank with a level switch (overflow protection)



Control unit with pre-filter to protect the pump



903002 0001



Model	Transport quantity l/h	Dimensions L x W x H mm	Weight kg	art.no.	€
EPW 550	550	1200 x 470 x 860	86	<b>903002 0001</b>	<b>5.419,-</b>

9115

### Spare parts

Description	suitable for	art.no.	€
Floater 150x150 mm	EPW 550	<b>903050 2005</b>	<b>172,-</b>
Fine filter insert 50 µm	EPW 550	903050 1050	<b>21,90</b>
Fine filter insert 100 µm	EPW 550	903050 1100	<b>21,90</b>

9116

### Repair kits

Description	suitable for	art.no.	€
Pump repair kit	Serial number EPW 550/001 to EPW 550/105	<b>903050 1200</b>	<b>450,-</b>
Pump repair kit	Serial number from EPW 550/106	<b>903050 1300</b>	<b>460,-</b>

9116



Filter insert



Floater



903050 1200



903050 1300

## SARA® Magnetic filter SMF

- Affordable extraction without consumables **SARA** Magnetic filters Particles and impurities from all types of process fluids e.g. cooling lubricant, washing water, cooling water, fuel and much more.
- Thanks to the extremely high field strength, dirt particles are extracted from iron, steel and partially stainless steel, carbide and corundum, and adhere to the exterior of the magnets.
- Separation of tiny particles as small as 1 µm
- Guaranteed flux density of at least 10,000 gauss
- Improved surface quality thanks to cleaner cooling lubricant
- Reduced wear to machinery and tools
- **No disposal costs, filtered material can be recycled**
- **No additional auxiliary energy required**

Considerably reduces operating costs



905010 3103

### Single units

Model	max. discharge rate l/min	Operating pressure max. bar	Connection thread	Dirt adhesion capacity kg	Number of magnetic filter rods	Weight kg	Height mm	Foot size mm	art.no.	€
SMF 240/1	Emulsion: 70, oil: 35	15	3/4" BSP	0.6	1	4.5	306	110x110	<b>905010 2401</b>	<b>659,-</b>
SMF 310/1	Emulsion: 100, oil: 50	15	1" BSP	0.8	1	5.0	391	110x110	905010 3101	979,-
SMF 310/3	Emulsion: 150, oil: 75	15	1 1/2" BSP	2.4	3	12.0	396	170x170	905010 3103	1.899,-

9109

### Spare parts

Description	suitable for model	art.no.	€
Gasket	SMF 240/1	<b>905011 2401</b>	<b>17,50</b>
Gasket	SMF 310/1	905011 3101	17,50
Gasket	SMF 310/3	905011 3103	43,80

9109

## SARA® Magnetic filters

INFO

Magnetic filters have the ability to remove ferrous particles from process fluids such as cooling water, emulsions, grinding oil, washing water, etc. Due to the force of the magnetic field, ferrous particles such as iron, steel, carbide, etc. are drawn from the process fluids and adhere to the magnetic filter rods. Thus the particles are extracted and can be disposed of quickly, easily and by type; meanwhile the clean process fluid can be reused.

### Function

In a filter housing, the contaminated water flows turbulently around the magnetic filter rods. The ferrous particles are drawn to the magnetic filter rods and adhere to the surface of the magnetic filter rods. The filter performance depends on several factors. These include the material and the size of the particles, the viscosity of the fluid to be purified, the magnetic flux density of the magnetic filter rods, the dwell time of the fluid in the magnetic field, as well as the distance between the particles and the magnetic filter rods. **Optimum separation rates** are achieved thanks to the use of ultra-efficient magnetic materials with very high magnetic forces and the flow-optimised design of SARA magnetic filters.

SARA magnetic filters are characterised, in particular, by the optimisation of these factors. The use of ultra-efficient magnetic filter rods with a magnetic flux density of at least 10,000 gauss guarantees the best filtration results, even filtering out particles measuring less than 1 µm. The optimised flow guidance in the magnetic filter also improves the effect of the magnetic filter rods.

### SARA magnetic filters are used in a wide range of production processes

- Filtration of cooling lubricants during grinding or honing work
- Purification of cooling water or washing water
- Removal of particles from cutting oils
- Removal of superfine particles from drawing oils

Using magnetic filters can enhance the manufacturing quality in production processes due to fewer particles, and thus significantly increase the service life of process fluids. SARA magnetic filters work without additional auxiliary power, are manufactured from high-quality, durable stainless steel, and are equipped with Viton seals.





## SARA® Belt skimmer



**Oil skimmer systems:** Contaminations in coolant emulsions from leaked oil floating on the surface, such as hydraulic oil, peripheral lubrication or contact surface oil cause problems with the production process. Oil leakages reduce oxygen absorption, thus encouraging bacterial growth. They also cause deposits to develop on machines and workpieces, increase the formation of oil mist and reduce cooling performance. The consequences are: skin diseases, unpleasant odours, higher disposal costs, corrosion, bacterial contamination, poor cooling performance and problematic chipping behaviour. The following oil skimmer systems provide assistance in this regard.

- Special oil-carrying belt
- Tramp oil removal from the emulsion surface
- Installed above the emulsion container, requires little space
- Immersion depth: 225 mm



### S series

- **For continuous or time-controlled operation (timer switch included)**
- Colour: RAL 7035 (light grey)
- **Delivery:** includes timer switch, skimmer belt (800 mm) and oil return hose

Model	Output l/h	Belt dimensions L x W mm	Connection V/Hz	Dimensions L x W x H mm	Weight kg	art.no.	€
S-40	4	800 x 40	230 / 50	190 x 105 x 160	4	904001 0040	689,-
S-100	8	800 x 100	230 / 50	250 x 105 x 160	6	904001 0100	1.019,-

9117



### F-series

- **High-quality aluminium casing**
- **Supplied with:** Base unit with 800 mm skimmer band, oil return hose, no timer

Model	Output l/h	Belt dimensions L x W mm	Connection	Dimensions L x W x H mm	Weight kg	art.no.	€
F-40	4	800 x 40	230 / 50	155 x 85 x 148	1.8	904020 0040	460,-

9117

### Spare skimmer belts

- Heat-resistant to 60 °C
- **Alternative version with higher heat or chemical resistance available on request**

suitable for	Belt dimensions L x W mm	art.no.	€
S-40, M-40	800 x 40	904050 8040	64,60
S-40, M-40	900 x 40	904050 9040	67,20
S-40, M-40	1000 x 40	904050 1040	72,80
S-40, M-40	1200 x 40	904050 1240	75,80

9118

suitable for	Belt dimensions L x W mm	art.no.	€
S-100, M-100	800 x 100	904050 8010	95,60
S-100, M-100	900 x 100	904050 9010	102,-
S-100, M-100	1000 x 100	904050 1010	108,-
S-100, M-100	1200 x 100	904050 1210	121,50

9118



## SARA® Disc skimmer

- Installed with a magnetic base on the side of the coolant container or directly on the container cover
- Universal adjustment possible by means of two joints
- Optimum skimmer disc immersion depth approx. 20 - 40 mm
- 6-step speed regulation via power supply
- **Supplied** with disc, magnetic base, 2 joints, wiper blade, oil drain connection and power supply



Model	Output l/h	Ø mm	Connection V/Hz	Tension V	Weight kg	art.no.	€
SK 300	Up to 6	300	230 / 50	3 - 12	3	906001 0300	569,-

9119

## SARA® Cutting fluid aerator to reduce bacterial growth

- **Reduces bacterial growth in the cutting fluid**
- Prevents a cohesive tramp oil slick
- Increases the service life of cutting fluids
- Tramp oil should then be removed using an emulsion treatment cart (9030020001) or skimmer system
- Removing tramp oil extends the service life and ensures an even bio balance in the cutting fluid
- Low-maintenance stainless steel housing for easy cleaning
- For direct mounting on the machine
- Can be set with daily or weekly timer
- **Supplied** with timer, aeration plates and connection hoses



Floating foreign oil



Aerating lubricant



Result: no cohesive oil slick

Model	Dimensions L x W x H mm	No. ventilation plates	Max. tank capacity l	Tension V	Output W	Weight kg	art.no.	€
350	400 x 90 x 75	1	350	240	5	3	906010 0350	360,-
500	400 x 90 x 75	2	500	240	5	3.4	906010 0500	410,-
1000	400 x 90 x 75	4	1000	240	10	4.6	906010 1000	629,-

9120



## SARA® Industrial vacuum cleaners

INFO

SARA industrial vacuum cleaners rely on innovative suction technology and their robust design for many years of use. Attention is paid not only to top-quality workmanship, but also to the high quality of the materials used.

Whether you need to remove coarse dirt, hazardous dusts or highly viscous liquids, SARA industrial vacuum cleaners have the right product for you.

Electric and compressed air vacuums from SARA are characterised by the following quality features:

- Reliable suction power
- Easy handling
- Robust design
- Very powerful thanks to highly developed suction technology
- Effective cleaning
- Long service life

### The right tool for every application

SARA offers compressed air vacuums and electric vacuums for the removal of dust, liquids, soldering fumes, welding fumes, chips, very hot materials, very cold materials, acidic substances, toxic substances, explosive materials and much more. Available in mobile or stationary version and also with explosion protection in accordance with current ATEX regulations as an option. There are also a range of different options for emptying: via a detachable collection container, via a silo flap, or direct emptying into the customer's own collection container.

Various filter types are available depending on the requirements of dusty extraction media, also in accordance with DIN EN 60335 2 69 Annex AA with IFA test certificate.

Please do not hesitate to contact us for your special cleaning requirements



Bypass process extracts emulsion directly into the disposal container



Vacuum chips even in hard-to-reach places

**SARA® Chip and emulsion vacuum cleaner****NEW**

- **Mobile vacuum cleaner for removing coarse particles from liquids as well as clearing up spills and wet chips**
- **A fully automatic bypass process is used to treat the liquid, with no staff intervention involved (simultaneous suction and drainage possible)**
- Quick and easy disposal of foreign matter thanks to removable basket (Ø 3mm perforated sheet)
- Permanent fill level monitoring by means of a viewing tube on the container
- Mechanical float device
- Safety filter cloth with ring – hydrophobic + oleophobic properties
- Fluid drained by an integrated immersion pump
- Colour: RAL 7035 (light grey)
- **Supplied with:** 3m suction hose, 2-pcs. hand tube, floor nozzle with rubber edges, crevice nozzle, PEM pump hose with 1" ball valve, aluminium hose holder and utensil box
- **Pricing:** ex works, includes packaging

**Standard version**

- Max. intake air: 360m³/h

Storage capacity l	Air quantity m³/h	Negative pressure mbar	Motor output kW	Tension V	Dimensions L x W x H mm	Weight kg	art.no.	€
80	360	220	2 x 1.1 kW	230	970 x 580 x 1300	55	<b>908040 0001</b>	<b>3.389,-</b>
								9113

**Spare parts, consumables**

Description	Illustration	art.no.	€					
PEM suction hose, light	1	<b>908050 0010</b>	<b>54,50</b>					
Aluminium Storz coupling Type C hose connector		908050 0020	48,50					
Hose clamp 32-50 mm		908050 0030	10,40					
PEM hose end piece NW38		908050 0040	40,-					
Crevice nozzle NW38, vacuum opening 60 x 10mm, chrome-plated	4	908050 0070	124,50					
PP float Ø 63mm x 130mm		908050 0090	95,60					
Safety chain for PP float Ø 60 x 100 mm		908050 0100	21,40					
Hand-held tube, 2-pcs, chrome-plated steel	2	908050 0250	99,70					
Floor nozzle with rubber lips	3	908050 0260	147,50					
Filter cloth Ø 360 x 150mm with plastic ring	5	908050 0280	99,20					
Chip basket 30-litre, Ø 3mm mesh and float guide	6	908050 0290	709,-					
Vacuum unit 2 x 1.1 kW, 230 V, 50 Hz		908050 0300	1.249,-					
								9113

**Spare filter**

Designation	art.no.	€	
Disposable filter 10 µm	<b>908050 0310</b>	<b>31,10</b>	
Reusable filter 150 µm	908050 0320	101,50	
			9114

**SARA® Compressed air chip and wet vacuum cleaner****NEW**

- **mobile vacuum cleaner for removing coarse particles from liquids, as well as clearing up spills and wet chips**
- quick and easy disposal of foreign matter thanks to removable basket (Ø 3mm perforated sheet)
- permanent fill level monitoring by means of a viewing tube on the container
- mechanical float device
- filter system with integrated stainless steel wire mesh Ø 200mm x 100mm as droplet separator
- integrated collector as cyclone pre-separator to protect the filter device
- suspended silencer Size 4 with protective cover
- chassis with robust release device for raising and lowering the collector below the filter tank
- Colour: RAL 7035 (light grey)
- **Supplied with:** 3m suction hose, 3-pcs. hand tube, aluminium floor nozzle, crevice nozzle, aluminium hose holder and utensil box
- **Pricing:** ex works, includes packaging

**Standard version**

- Max. intake air: 280m³/h
- Air requirement: 1.33m³/h
- Air consumption: 80Nm³/h

Storage capacity l	Air quantity m³/h	Negative pressure mbar	Operating pressure bar	Compressed air connection bar	Dimensions L x W x H mm	Weight kg	art.no.	€
80	280	340	6	1/2"	880 x 800 x 1500	75	<b>908020 0001</b>	<b>3.899,-</b>
								9113

Continued on next page &gt;&gt;&gt;

## Spare parts, consumables

Description	Illustration	art.no.	€
PEM suction hose, light	1	908050 0010	54,50
Aluminium Storz coupling Type C hose connector		908050 0020	48,50
Hose clamp 32-50 mm		908050 0030	10,40
PEM hose end piece NW38		908050 0040	40,-
Hand-held tube 3-pcs, chrome-plated steel, approx. 1200mm long	2	908050 0050	120,50
Aluminium floor nozzle with rubber lips, oil-resistant, 360 mm	3	908050 0060	175,-
Crevice nozzle NW38, vacuum opening 60 x 10mm, chrome-plated	4	908050 0070	124,50
Silencer insert size 4	7	908050 0080	202,-
PP float Ø 63mm x 130mm		908050 0090	95,60
Safety chain for PP float Ø 60 x 100 mm		908050 0100	21,40
Chip basket 40-ltr, Ø 3mm mesh and float guide	5	908050 0110	859,-
Wire mesh (Type 600) Ø 200 x 100mm made of 1.4301 stainless steel	6	908050 0120	749,-

9114



## SARA® Compressed air industrial vacuum cleaner

NEW

- **mobile compressed air vacuum cleaner for removing dry and non-flammable media such as dust, sand, chips, stops, granulate, grains, etc.**
- Corresponds to ATEX Product Guideline 2014/34/EU: Equipment Group II / Category 3 for Zone 22/2
- Filter tank with nine filter elements (total filter surface: 2m<sup>2</sup>) made of polyester needle felt with IFA Test Certificate for dust class M in accordance with DIN EN60335-2-69-Anh. AA.
- Filter elements are spread apart with earthed supporting bodies and are therefore self-cleaning during the suction operation
- Filter attachment with vacuum meter and auxiliary air flap
- The auxiliary air flap can generate a counter-air flow that exhausts the filter hose from the inside out. This efficient cleaning guarantees extremely long filter service-life, even with fine dust.
- 2.2m<sup>2</sup> HEPA - safety filter cartridge with test certificate for dust class H in accordance with DIN EN 60335-2-69 Anh. AA.
- integrated collector as cyclone pre-separator to protect the filter device
- Suspended silencer Size 4 with protective cover
- chassis with robust release device for raising and lowering the collector below the filter tank
- rollers and filter are electrostatically-conductive
- Colour: all steel parts plastic-coated in accordance with 681TA 70355 C00 DURA pol / black / micro-structure
- **Supplied with:** 3m suction hose, stainless steel hand tube, aluminium floor nozzle, wide rubber nozzle, round brush, PE-EL round-bottom bag, earthing cable, earthing clamp, aluminium hose holder and utensil box
- **Pricing:** ex works, includes packaging

for ATEX Zone 21 and 22



## Standard version

- Max. intake air: 440m<sup>3</sup>/h
- Air requirement: 2.0m<sup>3</sup>/h
- Air consumption: 120Nm<sup>3</sup>/h

Storage capacity l	Air quantity m <sup>3</sup> /h	Negative pressure mbar	Operating pressure bar	Compressed air connection bar	Dimensions L x W x H mm	Weight kg	art.no.	€
60	440	300	6	1/2"	880 x 800 x 1700	85	908030 0001	5.289,-

9113

## Spare parts, consumables

Description	Illustration	art.no.	€
Silencer insert size 4	7	908050 0080	202,-
PEM suction hose, light, anti-static	1	908050 0130	55,50
Hose coupling stainless steel NW50/50		908050 0140	197,50
Seal-form hose clamp		908050 0150	17,-
PEM hose end piece NW50		908050 0160	39,90
Hand-held tube, stainless steel, curved on both sides	2	908050 0170	385,-
EL wide rubber nozzle, oil-resistant incl. stainless steel hose joints	4	908050 0190	159,-
EL round brush with PES+MS brushes incl. stainless steel hose joints	5	908050 0200	159,-
PE-EL round-bottom bag (10 pieces)	6	908050 0210	142,50
Hepa filter 2.2qm	8	908050 0220	306,-
EL filter container w/ polyester needle felt filter elements (filt. surface 2m <sup>2</sup> )	9	908050 0230	1.169,-
Hose filter EL Ø 100 x 500mm	10	908050 0240	84,-

9114





## Freddy Chip and emulsion vacuum cleaner Freddy

- **Mobile vacuum cleaner for removing ultra-fine particles (max. 10 µm) from liquids**
- Within a few minutes, the coolant container of a machine tool is drained and the coolant fluid cleaned of solid particles and pumped back into the machine, all simply at the push of a selector lever
- Eliminates the need for laborious and time-consuming cleaning work
- Machine downtimes are reduced
- Durable and robust steel design with oil-resistant wheels
- Automatic level control by means of cut-off
- Compact design, simple handling, extremely manoeuvrable
- **Pricing:** ex works, including packaging

**For removing ultra-fine particles up to 10 µm**



### Freddy Ecominor

- 100 l capacity
- **Supplied** pre-fitted with hoses and accessories, standard filter 200 µm

Tank contents l	Absorption capacity mm H2O	Air quantity l/min	Suction power l/min	Power output l/min	Motor output kW	Tension V	Dimensions L x W x H mm	Weight kg	art.no.	€
100	2000	2800	190	60	2	240	1260 x 600 x 1200	80	<b>980100 0100</b>	<b>4.279,-</b>

9125



### Freddy Superminior

- 100 l capacity
- **Boost function for even more suction**
- **Supplied** pre-fitted with hoses and accessories for floor and liquid cleaning, standard filter 200 µm

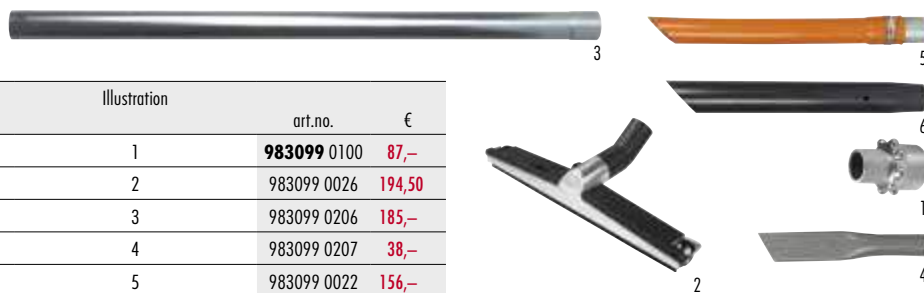
Tank contents l	Absorption capacity mm H2O	Air quantity l/min	Suction power l/min	Power output l/min	Motor output kW	Tension V	Dimensions L x W x H mm	Weight kg	art.no.	€
100	3800	2900	330	140	3	240	1350 x 690 x 1250	110	<b>980101 0001</b>	<b>5.339,-</b>

9125

### Accessories

Description	Colour	Illustration	art.no.	€
Adapter	Silver	1	<b>983099 0100</b>	<b>87,-</b>
Floor nozzle	Black/silver	2	983099 0026	<b>194,50</b>
Extension 1 m	White	3	983099 0206	<b>185,-</b>
Grooved nozzle	Grey	4	983099 0207	<b>38,-</b>
Flexible tube	Orange	5	983099 0022	<b>156,-</b>
Intake pipe 500 mm	Grey	6	983099 0023	<b>42,70</b>

9126



### Spare filter

Description	art.no.	€
Disposable filter 10 µm	<b>982501 0001</b>	<b>23,70</b>
Reusable filter 200 µm	982501 0002	<b>113,-</b>
Reusable filter 100 µm	982501 0005	<b>188,50</b>

9126



Spare filter



Vacuuming up dirty emulsion, chips and grinding sludge



Easy emptying of the filter insert



Returns the cleaned emulsion into the cooling lubricant container



## PIG Absorbent

- Optimum absorption results for oil, coolants, solvents, water
- Saves costs
- Safe, prevents slipping

**For leaking liquids  
on your premises!**

**INFO**



### Selection criteria for PIG® mats

Absorbed liquids	PIG® mat	Particularly well-suited for	Page	
<b>All-purpose</b> Absorbs and stores oils, coolants, solvents and water  For liquids such as: <ul style="list-style-type: none"> <li>• Hydraulic oil</li> <li>• Plant oil</li> <li>• Petrol</li> <li>• Paraffin</li> <li>• Anti-freeze</li> <li>• Propylene glycol</li> <li>• Acetone</li> <li>• Toluene</li> <li>• Xylene</li> <li>• MEK (Butanone, methyl ethyl ketone)</li> </ul>	Hard-wearing	<b>PIG BLUE™ mat</b>	Maintenance work that requires a high level of absorption	1609
		<b>PIG® all-purpose mat</b>	Absorption of leaks and dripping in the course of daily maintenance	1605
		<b>PIG® all-purpose drum lid mat</b>	Dripping pumps and cleaning of drum lids	1609
	Ultra-hard-wearing	<b>4 IN 1® mat</b>	General cleaning with an all-purpose product	1606
		<b>FAT MAT® all-purpose mat MAT 2101/2102</b>	Cleans up large leaks	1605
		<b>HAM-O® all-purpose mat</b>	Covering absorbing liquids for a clean workplace	1609
	Very hard-wearing	<b>PIG® elephant mat</b>	Passageways and walkways in highly visited areas	1608
		<b>TRAFFIC MAT® rug</b>	Passageways and walkways in areas with forklift traffic	1608
	<b>Oil-Only</b> Absorbs and stores oils and oily liquids without absorbing water  <ul style="list-style-type: none"> <li>• Motor oil</li> <li>• Hydraulic oil</li> <li>• Petrol</li> <li>• Diesel fuel</li> <li>• Paraffin</li> </ul>	Hard-wearing	<b>PIG® white oil-only mat</b>	Absorption of oil-based liquids with good visibility of liquids, can also be used in outdoor areas
Ultra-hard-wearing		<b>4 IN 1® oil-only mat</b>	General oily cleaning applications with a single product	1610
		<b>FAT MAT™ oil-only mat</b>	Cleans up large leaks	1610



### Selection criteria for PIG® absorbent linings

Absorbed liquids	absorbent lining	Absorption	Filling	Formability	Special characteristics	Page
<b>All-purpose</b> Absorbs and stores oils, coolants, solvents and water	<b>PIG® original</b>	Up to 1.9 l	Grits	Extreme	Extremely flexible and cheap, can be laid out closely around machines	1611
	<b>PIG® blue</b>	Up to 14 l	Granulate	super	Unbeaten ground adhesion, for use on dripping machines and for eliminating leaks	1611
	<b>PIG® super</b>	Up to 7.6 l	Cellulose	Normal	Extremely absorbent, ideal when maximum absorption performance is required	1611

**Many PIG® products are manufactured partly or fully from recycled materials. The percentage of recycled materials is always specified.**





## PIG Suction mat roll holder

- PIG roll holder for fast removal of mats as required
- For clean and safe storage of PIG mats



910110 0017

910101 0072

Model	Description	art.no.	€
GEN 249	Mat stands with rolls for PIG mats up to 91 cm wide	<b>910110 0015</b>	<b>226,-</b>
MAT 293	Wall bracket for PIG rolls up to 91 cm wide and 51 cm diameter	910101 0072	<b>89,50</b>
57701	Magnetischer Rollenhalter für PIG Rollen 38 cm x 15 m	910110 0017	<b>10,20</b>

9208



910110 0015

910101 0072

910110 0017

## PIG Universal mat

- **High absorbency ensures a clean and safe workplace**
- Simply place the mat over the spill
- Rapid absorption and high strength, even with fully saturated mats
- Saves on disposal costs due to the reduced volume
- Perforation enables mats to be laid as needed
- For absorbing oil, coolants, solvents and water
- Ideal for wiping off machinery, laying out tool boxes and covering work areas
- The exceptionally hard-wearing 4-in-1® mats (MAT284 and MAT235) can be used as an underlay, roll, wipe and absorbent sock
- **Price per pack**



### Mats

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
MAT 231	38 x 51 cm	Double thickness	50 pcs. per box	42 l	<b>910101 0001</b>	<b>71,20</b>
MAT 203	38 x 51 cm	Double thickness	100 units in box	84 l	910101 0020	<b>137,50</b>
MAT 204	38 x 51 cm	Single thickness	200 units in box	84 l	910101 0021	<b>136,50</b>
MAT 2101	41 x 51 cm	Quadruple thickness	50 units in dispenser box	84 l	910101 0042	<b>128,50</b>
MAT 240	38 x 51 cm	Double thickness	100 units in dispenser box	84 l	910101 0025	<b>143,50</b>

9201



MAT 231

### Roll material, perforated every 25.5 cm

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
MAT 137	76 cm x 46 m	Single thickness	1 roll	76 l	<b>910101 0032</b>	<b>115,-</b>
MAT 220	38 cm x 46 m	Double thickness	2 rolls	76 l	910110 0030	<b>229,-</b>
MAT 202-01	61 cm x 46 m	Double thickness	1 roll	123 l	910110 0035	<b>181,50</b>
MAT 230	76 cm x 46 m	Double thickness	1 roll	152 l	910110 0010	<b>226,-</b>
MAT 2102	81 cm x 23 m	Quadruple thickness	1 roll	152 l	910110 0033	<b>213,-</b>

9201



MAT 202-01

MAT 230

### Roll material, 4-in-1®, perforated every 25.5 cm, extremely hard-wearing

Type	Dimensions	Contents	Absorption capacity	art.no.	€
MAT 284	41 cm x 24 m	1 roll	35 l	<b>910110 0060</b>	<b>102,-</b>
MAT 235	41 cm x 46 m	1 roll	66 l	910110 0061	<b>181,50</b>

9201



MAT 284

Continued on next page >>>

**Roll material, continuous, for use in narrow areas**

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
MAT 229	25 cm x 46 m	Double thickness	3 rolls	51 l	910110 0025	226,-
						9201



MAT 229

**Roll material, longitudinal perforations every 25.5 cm and lateral perforations every 9.5 cm for ideal adjustment**

Type	Dimensions	Contents	Absorption capacity	art.no.	€	
MAT 242	38 cm x 18 m in dispenser box	1 roll	30 l	910110 0001	76,30	
MAT 243	38 cm x 46 m	1 roll	74 l	910110 0002	129,50	
						9201



MAT 242



**pig Universal absorbent fleece**

- Replaces cleaning cloth
- Perforations every 25cm
- Highly absorbent, fine-fibre structure that leaves virtually no liquid or fibre residues behind
- The single-layer design is ideal for small spills and cleaning operations.
- Ideal for workshops, tool trolleys, toolboxes and service areas

*For a clean workplace*

**NEW**

**Roller material**

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
MAT1990-DE	38 cm x 15 m	Single thickness	1 roll	12.5 l	910110 0026	33,60
MAT1991-DE	38 cm x 15 m	Single thickness	12 rolls	150 l	910110 0027	395,-
						9201



910110 0026



910110 0027

**pig Economy mat**

- **The cost-effective mat with a high absorption capacity**
- For small spills, leaking and dripping points
- For light-duty applications in walkway areas
- Ideal as an underlay for tools and workpieces
- **Price per pack**



MAT 411

**Roll material**

Type	Dimensions	Contents	Absorption capacity	art.no.	€	
MAT 411	76 cm x 61 m	1 roll	161 l	910110 0045	226,-	
						9201

**Mats**

Type	Dimensions	Contents	Absorption capacity	art.no.	€	
MAT 412	38 x 51 cm	125 pcs. in box	82 l	910101 0030	136,50	
						9201



MAT 412

## Grippy mat

- Absorbent mat with strong grip thanks to anti-slip underside
- Prevents slipping and tripping
- Grips the floor without adhesive tape
- Floor coverings can be removed without leaving residue
- Fluids cannot trickle out onto the floor
- Durable surface, suitable for pedestrian and forklift traffic
- **Price per pack**



### Roll material

Type	Dimensions	Contents	Absorption capacity	art.no.	€
MAT 1625	41 cm x 7.6 m	1 roll	7.5 l	<b>910105 1625</b>	<b>44,80</b>
MAT 3250	81 cm x 15 m	1 roll	30.3 l	910105 3250	163,-
MAT 32100	81 cm x 30 m	1 roll	60.6 l	910105 3210	308,-

9201



### Mats

Type	Dimensions	Contents	Absorption capacity	art.no.	€
MAT 3200	41 cm x 61 cm	10 pcs. in bag	7.5 l	<b>910105 3200</b>	<b>44,80</b>

9201

## Grippy mat with safety edge

**NEW**

- **Black/yellow signal pattern on the edges of the roll mat warns of hazards and guarantees increased safety**
- Absorbent mat with strong grip thanks to adhesive backing
- Prevents slipping and tripping
- Grips the floor without adhesive tape
- Floor coverings can be removed without leaving residue
- Fluids cannot trickle out onto the floor
- Durable surface, suitable for pedestrian and forklift traffic
- **Easy to clean:** You can sweep, wipe, vacuum or go over the mat with your wet vacuum or floor cleaner (cleaning makes the signal edge visible again)
- **Easy adjustment:** You can trim the mat to indicate the safest route, even around corners
- **Price per pack**

**91% more environmentally friendly than leased floor mats**



Type	Dimensions	Contents	Absorption capacity	art.no.	€
GRPSB36200	91 cm x 30 m	1 roll	30 l	<b>910105 6200</b>	<b>440,-</b>
GRPSB36201	91 cm x 15.3 m	1 roll	15 l	910105 6201	237,-

9201



## piig Grippy Traffic MAT® mat

- Very durable absorbent mat
- The material is heat-fused and needle-punched, creating a high level of durability
- The underside provides the mat with a strong grip, which reduces the risk of slipping and tripping
- **Price per pack**



### Roll material

Type	Dimensions	Contents	Absorption capacity	art.no.	€
GRP36201	91 cm x 15 m	1 roll	15 l	<b>910105 3621</b>	<b>187,50</b>
GRP36200	91 cm x 30 m	1 roll	50 l	910105 3620	347,-

9201

## piig Accessories: Grippy Mat



### Accessories: Grippy Mat

Type	Description	art.no.	€
GRP001	Cutting template	<b>910110 0020</b>	<b>25,50</b>
GRP012	Safety knife	910110 0022	12,25
GRP011	Spare blades	910110 0021	12,25

9208



## piig Elephant mat

- **Durable mat, roll material**
- High wear and tear resistance
- Keeps walkways and standing areas clean and safe
- Absorbs oil, coolants and solvents, water
- **Price per pack**



### Roll material

Type	Dimensions	Contents	Absorption capacity	art.no.	€
MAT 234	84 cm x 46 m	1 roll	87 l	<b>910110 0006</b>	<b>254,-</b>

9201

## piig Traffic mat

- **Hard-wearing mat for enhanced safety on smooth floors, roll material**
- Extremely hard-wearing
- MAT223 with PE lining on the underside
- Prevents liquids from leaking through
- **Price per pack**



### Roll material

Type	Dimensions	Contents	Absorption capacity	art.no.	€
MAT 223	91 cm x 30 m	1 roll	49 l	<b>910110 0055</b>	<b>241,-</b>
MAT 218	91 cm x 91 m	1 roll	148 l	910110 0050	365,-

9201



## pig Ham-O mat

- **Liquid disappears in seconds**
- Unique pattern hides leaks and drops
- Absorbs oil, water and coolant (not recommended for solvents, which could dissolve the embossed pattern)
- Extremely hard-wearing
- Practical perforation
- **Price per pack**



225 ml oil is poured onto the HAM-O...



... and completely absorbed in a matter of seconds.



910101 0081



MAT 267

### Roll material, perforated every 25.5 cm

Type	Dimensions	Contents	Absorption capacity	Colour	art.no.	€
MAT 267	41 cm x 46 m	1 roll in dispenser box	89 l	Green	910101 0081	174,-
MAT 269	81 cm x 46 m	1 roll	180 l	Green	910110 0269	315,-
MAT 116	81 cm x 46 m	1 roll	179.5 l	Grey	910101 0022	312,-

9201



910101 0022



MAT 116

## pig Drum lid mats

- **Keep drum lids clean and dry**
- Absorbs oil, cooling solvents, water
- Pre-cut, fits perfectly onto a 210 litre drum
- **Price per pack**



MAT 208

Type	Ø cm	Thickness	Contents	Absorption capacity	art.no.	€
MAT 208	56	Double thickness	25 units in box	26 l	910101 0041	94,60

9201

## pig Blue mat

- Made of 75 % recycled material
- **High absorption capacity**
- Absorbs oils, coolants, solvents and water
- Good floor adhesion, highly resistant even when saturated
- **Price per pack**



### Mats in a dispenser box

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
BLU107	38 x 48 cm	Single thickness	50 units in box	45.5 l	910200 0107	58,50
BLU106	38 x 48 cm	Double thickness	50 units in box	64.5 l	910200 0106	68,70
BLU100	38 x 48 cm	Single thickness	100 units in box	90 l	910200 0100	113,-
BLU101	38 x 48 cm	Double thickness	100 units in box	129 l	910200 0101	132,50

9201



BLU 100

### Roll material, perforated every 25.5 cm

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
BLU105	38 cm x 46 m	Single thickness	1 roll	78 l	910201 0105	95,60
BLU103	38 cm x 46 m	Double thickness	1 roll	121 l	910201 0103	111,-
BLU104	76 cm x 46 m	Single thickness	1 roll	155 l	910201 0104	183,50
BLU102	76 cm x 46 m	Double thickness	1 roll	242.5 l	910201 0102	215,-

9201



BLU 104

### Drum lid mats

Type	Ø cm	Thickness	Contents	Absorption capacity	art.no.	€
BLU255	56	Single thickness	25 units in box	45.4 l	910202 0255	80,40

9201



BLU 0255

## Oil-Only mat (white)

- **The special white mat absorbs oil only, no water**
- Made of polypropylene, absorbs oil drops and leaks
- Water-resistant, which means it is also suitable for outdoor use. Absorption capacity is not affected by rain
- The exceptionally hard-wearing 4-in-1® Mats (MAT484 and MAT435) can be used as an underlay, roll, wipe and absorbent sock.
- **Price per pack**



### Mats

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
MAT 415	38 x 51 cm	Double thickness	50 units in box	42 l	911001 0010	56,-
MAT 4101	41 x 51 cm	Quadruple thickness	50 units in box	84 l	911001 0013	116,-
MAT 440	38 x 51 cm	Medium	100 in box	84 l	918009 0013	115,-
MAT 403	38 x 51 cm	Double thickness	100 units in box	84 l	911001 0011	109,-
MAT 460	38 x 51 cm	Medium	125 pcs. in bag	83 l	918009 0021	109,-
MAT 423	38 x 51 cm	Single thickness	200 units in box	84 l	911001 0001	109,-

### Roll material

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
MAT 401	76 cm x 46 m	Double thickness	1 roll	152 l	911010 0012	184,50
MAT 4102	81 cm x 23 m	Quadruple thickness	1 roll	152 l	911010 0013	195,50
MAT 461	76 cm x 61 m	Medium	1 roll	161 l	918009 0022	184,50

### Roll material, 4-in-1®, perforated every 25.5 cm, extremely hard-wearing

Type	Dimensions	Contents	Absorption capacity	art.no.	€
MAT 484	41 cm x 24 m in dispenser box	1 roll	35 l	910101 0048	95,60
MAT 435	41 cm x 46 m	1 roll	66 l	910101 0043	165,-

### Roll material, perforated, in a dispenser box

Type	Dimensions	Thickness	Contents	Absorption capacity	art.no.	€
MAT 442	38 cm x 18 m	Double thickness	1 roll	30	918009 0014	63,10



MAT 401



MAT 484



MAT 435



MAT 443

## HAZ-MAT mat

- **Specially for absorbing acids and aggressive liquids**
- Simply place the mat over the spill
- Rapid absorption and high strength, even with fully saturated mats
- Saves on disposal costs due to the reduced volume
- Perforation enables mats to be laid as needed
- Resistance list available on request
- **Price per pack**



### Mats

Type	Dimensions	Thickness mm	Contents	Absorption capacity	art.no.	€
MAT 301	38 x 51 cm	Double thickness	100 units	84 l	912001 0002	143,50

### Roll material

Type	Dimensions	Thickness mm	Contents	Absorption capacity	art.no.	€
MAT 309	76 cm x 46 m	Double thickness	1 roll	152 l	912010 0001	250,-



## pig Absorbent sock

- For absorbing drops and leaks in all parts of your machinery
- For a clean and safe workplace
- Cost savings thanks to low disposal volumes
- Absorbs oil, water, coolants and solvents
- Exceptionally supple, for surrounding heavily leaking machinery or for containing leaks
- Sock forms a tight seal with the floor
- Price per pack



### Original

- Cost-effective
- For daily use

Type	Dimensions	Contents	Absorption capacity	art.no.	€
204	Ø 8 x 107 cm	20 units	38 l	910120 0001	64,10
404	Ø 8 x 107 cm	40 units	76 l	910120 0002	110,-



### BLUE

- Effective for all-purpose application

Type	Dimensions	Contents	Absorption capacity	art.no.	€
PIG 203	Ø 8 x 600 cm	4 units	56 l	910120 0014	106,-
PIG 202	Ø 8 x 300 cm	8 units	56 l	910120 0013	106,-
2048	Ø 8 x 122 cm	20 units	56 l	910120 0010	79,90
PIG 201	Ø 8 x 61 cm	55 units	77 l	910120 0012	130,50
4048	Ø 8 x 122 cm	40 units	112 l	910120 0011	146,50



### SUPER

- Maximum absorption capacity to meet the toughest requirements

Type	Dimensions	Contents	Absorption capacity	art.no.	€
PIG 214	Ø 8.25 x 213 cm	12 units	91 l	910120 0042	115,-
PIG 210	Ø 8.25 x 107 cm	24 units	91 l	910120 0040	108,-
PIG 211	Ø 8.25 x 53 cm	48 units	91 l	910120 0041	118,-



## pig Absorbent pillow

- Absorbs oil, coolant, water and all non-aggressive liquids
- Robust, tear-proof polypropylene cover
- Also for use in confined spaces, under hydraulic lines and in the tightest corners
- Price per pack



### Absorbent pillow

Type	Dimensions	Contents	Absorption capacity	art.no.	€
PIL 201	53 x 43 x 5 cm	16 units	121 l	910101 0055	120,50
PIL 204	25 x 25 x 5 cm	40 units	76 l	910101 0060	110,-



## pig DRAINBLOCKER®

- Drain covers
- Special shape creates a secure seal over the drain opening
- Made of flexible polyurethane for protection against water, oil and most chemicals
- Easy to clean and therefore re-usable
- Cover must overlap the drain by at least 8 cm on all sides



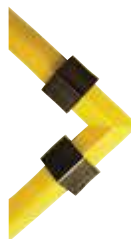
Type	Dimensions	Contents	art.no.	€
PLRE 241	46 x 46 x 1.1 cm	1 unit	913020 0001	134,50
PLRE244	61 x 61 x 1.1 cm	1 unit	913020 0055	241,-
PLRE 242	91 x 91 x 1.1 cm	1 unit	913020 0002	460,-
PLRE 243	122 x 122 x 1.1 cm	1 unit	913020 0003	669,-

9203

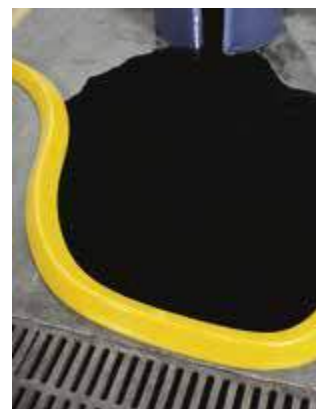


## PIG SPILLBLOCKER®

- **Containing leaks**
- Made of non-absorbent polyurethane; resistant to water, oil and most chemicals
- Flexible down to -20°C - adheres to smooth floors, forms a dam that can be curved as necessary
- Containing liquids
- Diverting liquids
- Protects sites from approaching liquid flows
- Due to the high weight and flexibility of the polyurethane, SPILLBLOCKER® forms a tight seal with the floor with even minor surface irregularities sealed
- Connecting sections for joining together and corner sections for rectangular layouts available



Rectangular barriers are formed using corner sections PLR206.



For greater leaks, two or more barriers are jointed with connectors PLR205.

Type	Dimensions	Contents	art.no.	€
PLR 204 barrier	5.7 x 10 x 300 cm	1 unit	913001 0001	529,-
PLR 205 connector	5.7 x 10 cm	1 unit	913001 0005	21,40
PLR 206 corner piece	5.7 x 10 cm	1 unit	913001 0006	49,90

9203

## PIG LITE-DRI absorbent

- **Absorbs up to 30 litres per bag, three times more than binding granulate**
- Absorption capacity: 1 kg = approx. 3 l
- Rapid absorption
- No silicate dust formation
- Does not scratch floors or machinery (cellulose-based)
- Leaves ash residue of less than 5 % when incinerated.
- **Pricing:** ex works, including packaging



Contents	art.no.	€
10 kg	911001 0300	23,40

9203

## SARA® Special granules SARA-Sorb V2000

- 1 kg granulate is sufficient for approx. 30 - 45 m<sup>2</sup>
- Absorption capacity: 1 kg = 0.724 litre
- Up to three times higher absorption than conventional granulates
- Absorbs virtually all liquids during operation, e.g. leaking oil, fuel, chemicals, acids, alkalis and solutions
- Fine-grained, Class III R natural material that has been calcinated several times for ecological and cost-saving use on smooth or porous surfaces
- Dust and asbestos-free, chemically neutral, non-combustible, non-toxic, crush-resistant, does not stain and leaves no residues
- Retains its strength even in a saturated state (no sludge formation)
- **Note:** All used oil binders must be disposed of in accordance with the waste code number and the medium that was absorbed.
- **For orders of 1 pallet (65 buckets or 56 bags of 10 kg), we offer a 20 % volume discount**
- **Pricing ex works, including packaging**



920101 0010



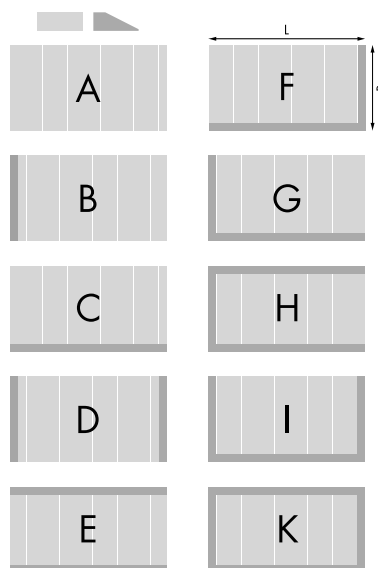
920101 0100

Contents	art.no.	€
10 kg bucket	920101 0010	19,25
10 kg bag	920101 0100	14,15

9128

## SARA® Foot grilles

- **The safe machine base**
- Made of dried beech
- Can be rolled up - practical for cleaning
- Elastic, relieves strain on the vertebrae
- Robust, can also withstand hard use on machines
- Maintenance-free, no wear at connecting elements
- Supported by oil-resistant, fibre-reinforced rubber belts
- Profiled batten surface, height 3.5 cm
- Available grille widths 60 - 150 cm
- Grille length as required, prices per running metre
- 970111.... Standard version without access ramp
- 970112.... Additional charge for version with access ramp along one width (for version with access ramps along both widths, please order 2x)
- 970113.... Additional charge for version with access ramp along length
- 970114.... Additional charge for impregnation
- Corundum coating for maximum skid resistance also available on request
- Price per running metre
- **For orders with access ramp on one side, please specify which side (see example)**
- **Delivery:** free kerbside delivery within Germany, excluding platforms and custom designs



Platforms and custom designs available on request



Width mm	Number of cover rows	Walk grating		Ramp edge along width		Ramp edge along length		Impregnation	
		art.no.	€	art.no.	€	art.no.	€	art.no.	€
600	2	970111 0602	95,10	970112 0602	17,20	970113 0602	19,65	970114 0602	18,85
700	2	970111 0702	120,50	970112 0702	17,20	970113 0702	19,65	970114 0702	22,-
800	2	970111 0802	136,50	970112 0802	17,20	970113 0802	19,65	970114 0802	25,10
800	3	970111 0803	172,-	970112 0803	17,20	970113 0803	19,65	970114 0803	25,10
900	3	970111 0903	193,50	970112 0903	17,20	970113 0903	19,65	970114 0903	28,20
1000	3	970111 1003	202,-	970112 1003	17,20	970113 1003	19,65	970114 1003	31,40
1100	3	970111 1103	224,-	970112 1103	17,20	970113 1103	19,65	970114 1103	34,50
1200	3	970111 1203	239,-	970112 1203	17,20	970113 1203	19,65	970114 1203	37,70
1300	3	970111 1303	255,-	970112 1303	17,20	970113 1303	19,65	970114 1303	40,70
1400	3	970111 1403	270,-	970112 1403	17,20	970113 1403	19,65	970114 1403	43,90
1500	3	970111 1503	295,-	970112 1503	17,20	970113 1503	19,65	970114 1503	47,-
		9130		9130		9130		9130	



Corundum coating for maximum skid resistance also available on request



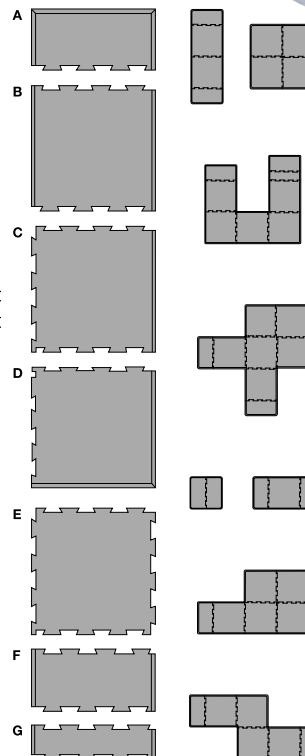
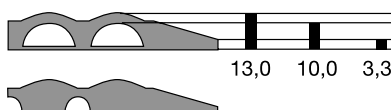
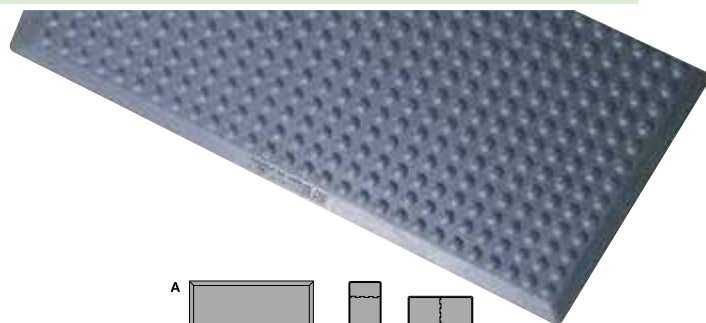
Platforms and custom designs available on request





## ☀️ sunnex Mat system

- **For damp and oily areas**
- Thickness: 13 mm
- A significant factor influencing the health and productivity of staff
- Reduces fatigue and joint pain in the feet, legs and back
- Non-slip, noise and heat insulating
- Sealed surface, easy to clean
- Tapered edge, no trip hazard, can be driven over
- Individual parts can be fitted together like jigsaw pieces
- Dovetail profile for simple, tool-free connection
- Nitrile rubber – exceptionally resistant to wear, cleaning agents, cutting oils, hot chips, falling tools
- **ESD version available on request**



Standard measuring units and installation example

Description	L cm	Width cm	Type	art.no.	€
Base set	150	75	A+B+A	<b>975001</b> 1575	<b>260,-</b>
Corner	37.5	75	A	975003 0001	<b>79,40</b>
Centre	75	75	B	975003 0005	<b>111,-</b>
Edge	75	75	C	975003 0010	<b>111,-</b>
Corner	75	75	D	975003 0015	<b>111,-</b>
Centre	75	75	E	975003 0020	<b>111,-</b>
Extension	37.5	75	F	975003 0025	<b>79,90</b>
Extension	17.5	75	G	975003 0030	<b>55,50</b>
9129					



## NOTRAX® pig Anti-fatigue mat Sorb-Stance

- **For damp and oily areas**
- Thickness: 19 mm
- Made of high-quality nitrile rubber
- Special profiles on the underside ensure excellent cushioning
- Combines the advantages of an anti-fatigue mat with an absorbent mat
- Can be combined with PIG absorbent mats, article numbers 910101 0106 and 910101 0107



### Anti-fatigue mat, without absorbent mat

L cm	Width cm	Weight kg	art.no.	€
163	91	18	<b>970148</b> 1016	<b>301,-</b>
316	91	33	970148 1031	<b>569,-</b>
9131				

### PIG® All-in-1 mat

- Suitable for insertion in anti-fatigue mats

Type	L cm	Width cm	Contents	Absorption capacity	art.no.	€
RFLE906	150	81	10 units	58.5 l/VPE	<b>910101</b> 0106	<b>142,50</b>
RFLE907	300	81	10 units	117.1 l/PU	910101 0107	<b>249,-</b>
9201						



## NO TRAX Ergonomic workplace floor covering DIAMOND SOF-TRED

- For dry areas
- Thickness: 12,7 mm
- Weight: approx. 6 kg/m<sup>2</sup>
- Floor covering for walking and standing in safety
- Non-slip surface
- Extra strong vinyl foam ensures enhanced ergonomic benefits
- Prevents premature symptoms of fatigue and protects the user from cold concrete floors, protects the floor and reduces the risk of breaking tools
- Dyna-Shield™ hard-wearing surface increases durability by 50 % in comparison to conventional vinyl floor coverings
- Four tapered edges eliminate tripping hazards

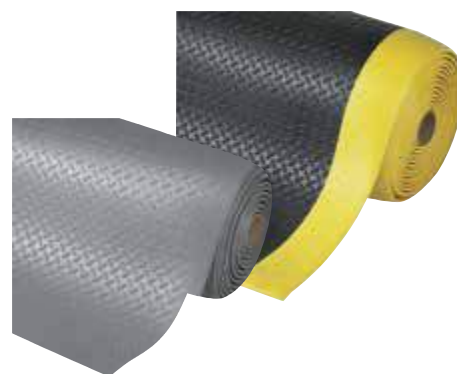
### Mats

L cm	Width cm	Grey		Black/yellow	
		art.no.	€	art.no.	€
91	60	970149 6009	43,80	970150 6009	47,50
150	91	970149 9015	109,-	970150 9015	118,-
300	91	970149 9030	239,-	970150 9030	260,-
600	91	970149 9060	485,-	970150 9060	529,-
		9131		9131	

### Rolled product (max. 18.3 m length)

- Price per running metre

Width cm	Grey		Black/yellow	
	art.no.	€	art.no.	€
60	970153 0060	53,40	970154 0060	57,50
91	970153 0091	79,90	970154 0091	87,50
122	970153 0122	107,-	970154 0122	116,-
	9131		9131	



## NO TRAX Rubber floor mats

- For damp and oily areas
- Non-slip surface and secure grip of the floor surface
- Extremely durable and versatile for industrial use
- **100% nitrile rubber makes it resistant to numerous oils and chemicals**
- Practically indestructible, designed for harsh working environments where safety and durability are essential
- Outstanding protection against fatigue when working in a standing position
- Orange safety edges made of nitrile rubber on three sides
- **Also available with red edge strips on request**

### Safety Stance™

- Thickness: 22 mm
- Perforated surface

Description	art.no.	€
Black, 3 orange safety edges	970156 6610	158,-
	9131	

### Modular system for customised configurations

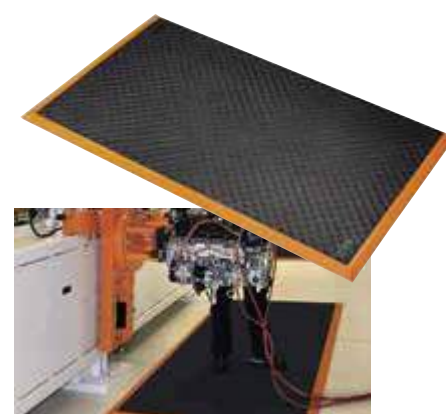
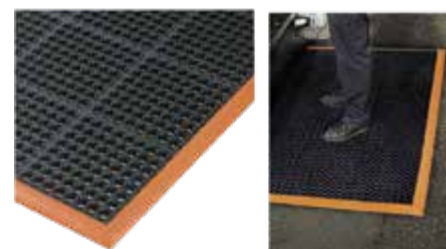
Description	Dimensions cm	art.no.	€
Standard module	91 x 152	970155 9115	186,50
Connector	30	970155 0030	10,35
Edge strip, orange	91	970155 0091	20,80
Edge strip, orange	152	970155 0152	34,40
		9131	

### Safety Stance Solid™

- Thickness: 20 mm
- Sealed surface

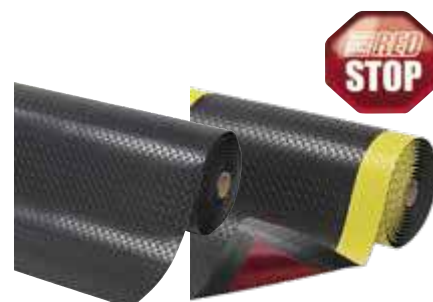
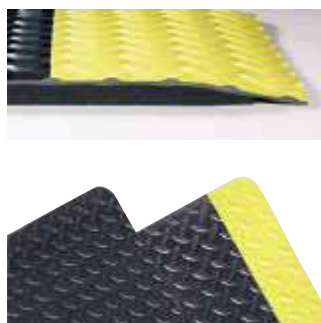
Description	L mm	Width mm	art.no.	€
Black, 3 orange safety edges	102	66	970158 6610	224,-
Black, 3 orange safety edges	163	97	970158 9716	370,-
Black, 3 orange safety edges	315	97	970158 9731	839,-
			9131	

Made-to-measure on request



## NO TRAX® Industrial workplace mat Cushion Trax™

- **For dry areas**
- Thickness: 14 mm
- Weight: 6.5 kg/m<sup>2</sup>
- For demanding industrial applications in dry work areas
- Very rugged design offering a high level of standing comfort
- All-round tapered edges remove any trip hazard
- Stable, laminated surface over damping vinyl foam
- Tested with RedStop anti-slip backing (R 10)
- Meets fire protection class Bfl-S1
- Colours: black or black with yellow safety stripes
- Made-to-measure in 3 different standard widths
- **Rolled product (max. 22.8 m length)**
- **Price per running metre**



Colour	Width mm	art.no.	€
Black	60	970157 0060	103,-
Black	91	970157 0091	154,-
Black	122	970157 0122	204,-
Black	152	970157 0153	255,-
Black/yellow	60	970157 1060	111,-
Black/yellow	91	970157 1091	167,-
Black/yellow	122	970157 1122	224,-
Black/yellow	152	970157 1152	311,-

9131



## ATORN® Flame-retardant workplace mat

NEW

- **for dry (coin tread) and damp (studded tread) areas**
- Thickness: 13mm
- Weight: 2.9kg
- Material: polyurethane foam
- pursuant to EN13501-1 /floor covering test flame-retardant and therefore also suitable for use in public buildings
- in accordance with fire protection class Bfl-S1
- heat-resistant against short-term sparking and welding beads
- hardness 25-30 Shore A

for grinding and welding workstations



Dimensions cm	Washer profile		Hemispherical	
	art.no.	€	art.no.	€
96 x 66	970200 0010	126,50	970200 0030	126,50
120 x 90	970200 0020	243,-	970200 0040	243,-
	8108		8108	

# Environmental technology info

Other workplace mats available as mats, rolls, tiles or customised mats on request:

- dry areas
- damp areas
- oily areas
- fireproof areas
- ESD areas
- Hygiene mats
- Food industry
- Specialist industrial areas



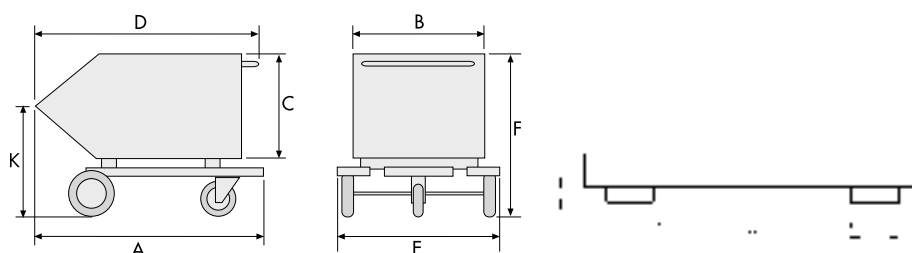


**BAUER** Steel sheet box cart

- **Manual tipper with level-ground discharge facility**
- **For all types of bulk material**
- **Load bearing capacity 300 kg**
- Welded oil and water-tight
- Strong sheet steel design with edge reinforcement
- Base frame made of profile steel
- Spring-loaded anti-tip lock
- Forklift pockets designed to prevent accidental slipping and tipping off
- Painted RAL 5012 (light blue) or RAL 7005 (mouse grey)
- **Other RAL colours available on request**
- **Custom designs available on request**
- **Supplied with:** two wheels plus one swivel castor (from 0.6 m<sup>3</sup> 2 wheels & 2 swivel castors) made of solid rubber, including one swivel castor with wheel stop, push handle
- **Pricing: free kerbside delivery within Germany**



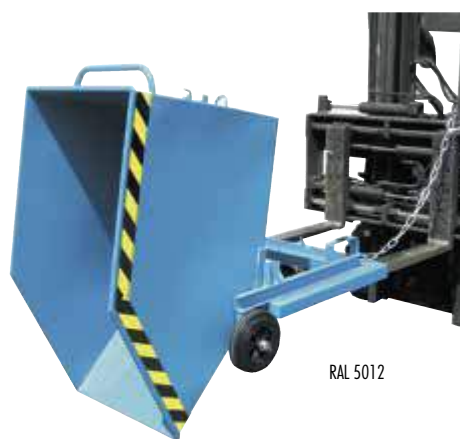
RAL 5012



RAL 7005

**Standard version**

Contents m <sup>3</sup>	A mm	B mm	C mm	D mm	E mm	F mm	H mm	I mm	J mm	K mm	Roller quantity	Weight kg	RAL 5012		RAL 7005	
													art.no.	€	art.no.	€
0.25	1115	560	610	1120	820	990	465	55	170	690	3	75	955004 0250	609,-	955004 0251	609,-
0.40	1320	660	710	1330	900	1090	465	55	170	740	3	91	955004 0400	689,-	955004 0401	689,-
0.60	1395	830	780	1400	1070	1220	465	55	170	830	4	139	955004 0600	859,-	955004 0602	859,-
1.00	1420	1100	850	1430	1340	1290	465	55	170	870	4	164	955004 1000	1.049,-	955004 1001	1.049,-
													9107		9107	



RAL 5012



RAL 7005

**Sheet steel box tipper for collecting and separating liquids and solids**

- Screen plate for chip collection, hole Ø 3 mm, division 6 mm
- Drain cock 1" for draining the liquids

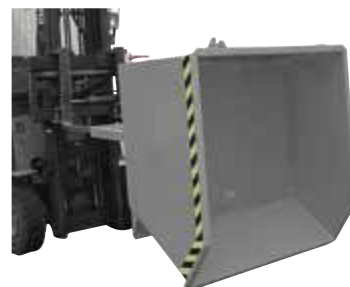
Contents m <sup>3</sup>	A mm	B mm	C mm	D mm	E mm	F mm	H mm	I mm	J mm	K mm	Roller quantity	Weight kg	RAL 5012		RAL 7005	
													art.no.	€	art.no.	€
0.25	1115	560	610	1120	820	990	465	55	170	690	3	77	955007 0250	679,-	955007 0252	679,-
0.40	1320	660	710	1330	900	1090	465	55	170	740	3	93	955007 0400	729,-	955007 0401	729,-
0.60	1395	830	780	1400	1070	1220	465	55	170	830	4	141	955007 0600	959,-	955007 0601	959,-
1.00	1420	1100	850	1430	1340	1290	465	55	170	870	4	167	955007 1000	1.149,-	955007 1001	1.149,-
													9107		9107	

**BAUER** Chip containers

- **Tipping at any height by means of cable control from the forklift seat**
- **For all types of bulk material**
- **Load bearing capacity up to 1500 kg**
- Welded oil and water-tight
- Low height
- Tank plate with circumferential edge profile
- Robust base frame with forklift pockets
- Designed to prevent accidental slipping and tipping off
- Painted RAL 5012 (light blue) or RAL 7005 (mouse grey)
- **Other RAL colours available on request**
- **Custom designs available on request**
- **Supplied with:** Tipper without castors (castors available on request)
- **Pricing:** free kerbside delivery within Germany



Equipped with optional castors, RAL5012



RAL 7005



**Version for collecting and separating liquids and solids**

- Screwed perforated sheet for chip collection, hole Ø 3 mm, division 6 mm
- Drain cock 1" for draining the liquids

Contents m <sup>3</sup>	Dimensions L x W x H mm	Load bearing capacity kg	Weight kg	H mm	I mm	J mm	RAL 5012		RAL 7005	
							art.no.	€	art.no.	€
0.30	1440 x 680 x 580	750	125	10	60	200	955011 0300	1.099,-	955011 0302	1.099,-
0.50	1440 x 780 x 680	1000	137	150	60	200	955011 0500	1.349,-	955011 0510	1.349,-
0.75	1440 x 1280 x 680	1000	169	495	60	200	955011 0750	1.519,-	955011 0751	1.519,-
1.00	1640 x 1280 x 780	1500	220	495	60	200	955011 1000	1.819,-	955011 1002	1.819,-
1.50	1640 x 1280 x 1090	1500	250	495	60	200	955011 1500	2.059,-	955011 1501	2.059,-
							9107		9107	



**COLLECT  
SHIP AND  
STORE**

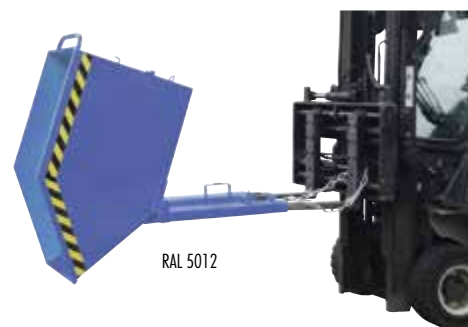


**BAUER**  
Lift truck attachments  
and warehouse equipment  
176 pages  
Art.no. 019900 5634

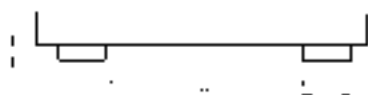
Overview of all free manufacturers' catalogues  
on page 16/17

## BAUER Tipping troughs

- For collecting and disposing of bulk goods and industrial waste
- Strong sheet steel design with edge reinforcement
- Tippable trough with handle
- Base frame with profile steel forklift pockets, easy to move with a forklift
- Welded oil and water-tight
- Designed to prevent accidental slipping and tipping off
- Can be fitted with castors
- **Custom designs available on request**
- **Other RAL colours available on request**
- **Supplied with:** Tipping trough without castors, safety chain
- **Pricing:** free kerbside delivery within Germany



RAL 5012



### Box-shaped trough

- For collecting and separating liquids and solids
- Perforated plate insert for collecting chips
- Drain cock 1" for draining the liquids

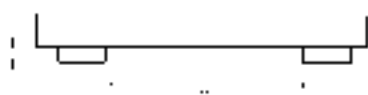


RAL 7005

Contents m <sup>3</sup>	Dimensions L x W x H mm	Pouring edge height mm	Load bearing capacity kg	Weight kg	H mm	I mm	J mm	RAL 5012		RAL 7005	
								art.no.	€	art.no.	€
0.25	1115 x 590 x 740	430	300	61	205	55	170	955017 0250	599,-	955036 0250	599,-
0.40	1320 x 670 x 840	484	300	75	285	55	170	955017 0400	689,-	955036 0400	689,-
0.60	1390 x 840 x 910	516	300	116	455	55	170	955017 0600	919,-	955036 0600	919,-
0.80	1420 x 910 x 975	556	300	127	525	55	170	955017 0800	989,-	955036 0800	989,-
1.00	1420 x 1110 x 975	556	300	140	725	55	170	955017 1000	1.049,-	955036 1000	1.049,-
								9107		9107	



RAL 5012



RAL 7005

### Low trough

- For collecting and separating liquids and solids
- Perforated plate insert for collecting chips
- Drain cock 1" for draining the liquids

Contents m <sup>3</sup>	Dimensions L x W x H mm	Pouring edge height mm	Load bearing capacity kg	Weight kg	H mm	I mm	J mm	RAL 5012		RAL 7005	
								art.no.	€	art.no.	€
0.25	1320 x 670 x 535	527	300	64	205	55	170	955019 0250	579,-	955038 0250	599,-
0.40	1390 x 840 x 610	605	300	77	455	55	170	955019 0400	689,-	955038 0400	689,-
								9107		9107	

### Cover for chip trough tipper

suitable for	art.no.	€
Chip tipping trough 0.25 m <sup>3</sup>	955036 0010	152,-
Chip tipping trough 0.40 m <sup>3</sup>	955036 0020	172,-
Chip tipping trough 0.60 m <sup>3</sup>	955036 0030	192,50
Chip tipping trough 0.80 m <sup>3</sup>	955036 0040	201,-
Chip tipping trough 1.00 m <sup>3</sup>	955036 0050	216,-
Chip tipping trough 0.40 m <sup>3</sup> , low trough	955038 0020	172,-
Chip tipping trough 0.25 m <sup>3</sup> , low trough	955038 0010	152,-

9107



## BAUER Swivel and fixed castors for tipping troughs

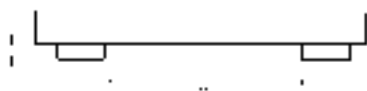
- Swivel castor with wheel stop

Description	D mm	art.no.	€
2 swivel and 2 fixed castors made of polyamide, height 225 mm	180	<b>955036 0060</b>	<b>229,-</b>
9107			



## BAUER Tipper with roller system

- **Compact tipper with roller system, good centre of gravity**
- **Tipping at any height by means of cable control from the forklift seat**
- **For all types of bulk material**
- **Load bearing capacity up to 1500 kg**
- Robust sheet steel design with circumferential edge profile
- Robust base frame with forklift pockets
- Designed to prevent accidental slipping and tipping off
- Painted RAL 5012 (light blue) or RAL 7005 (mouse grey)
- **Other RAL colours available on request**
- **Custom designs available on request**
- **Supplied with:** Tipper without castors (castors available on request)
- **Pricing:** free kerbside delivery within Germany



Equipped with optional castors, RAL 5012



RAL 7005

### Standard version

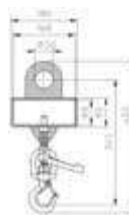
Contents m <sup>3</sup>	Dimensions L x W x H mm	Load bearing capacity kg	Weight kg	H mm	I mm	J mm	RAL 5012		RAL 7005	
							art.no.	€	art.no.	€
0.15	960 x 640 x 540	750	70	170	80	200	<b>955001 0150</b>	<b>749,-</b>	<b>955001 0152</b>	<b>749,-</b>
0.30	1260 x 770 x 835	750	112	300	80	200	955001 0300	769,-	955001 0301	769,-
0.60	1260 x 1070 x 835	1000	131	600	80	200	955001 0600	889,-	955001 0602	889,-
0.90	1260 x 1570 x 835	1000	173	600	80	200	955001 0900	989,-	955001 0901	989,-
1.20	1720 x 1070 x 1095	1500	200	600	80	200	955001 1200	1.069,-	955001 1202	1.069,-
1.70	1720 x 1570 x 1095	1500	240	600	80	200	955001 1700	1.519,-	955001 1701	1.519,-
2.10	1720 x 1870 x 1095	1500	265	600	80	200	955001 2100	1.669,-	955001 2102	1.669,-
							9107			9107

### Optional additional equipment

Description	suitable for	art.no.	€
2 swivel and 2 fixed castors, 180 mm, load bearing capacity: 450 kg/castor	All	<b>955003 0010</b>	<b>229,-</b>
Welded oil and water-tight	Size 0.15 0.30 0.60 0.90 m <sup>3</sup>	955003 0020	86,-
Welded oil and water-tight	Size 1.20 1.70 2.10 m <sup>3</sup>	955003 0030	112,-
9107			

## BAUER Forklift load hook

- Holding fixture with 1 or 2 fork arms
- Safety mechanism to prevent slipping off
- With rotating load hook
- Surface painted in RAL 2000 (yellow orange) or hot-dip galvanised
- **Free kerbside delivery within Germany**

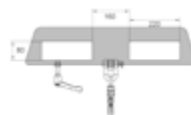


### For lifting with 1 fork arm

- With eyelet for lifting by crane
- Forklift pocket inner dimensions A / B / C (mm): - / 168 / 68

Dimensions L x W x H mm	Load bearing capacity kg	Weight kg	Galvanised	
			art.no.	€
300 x 180 x 395	1000	10	<b>958002</b> 1000	<b>250,-</b>

9107



### For lifting with 2 fork arms

- Also suitable for lifting trucks
- Forklift pocket inner dimensions A / B / C (mm): 160 / 220 / 80

Dimensions L x W x H mm	Load bearing capacity kg	Weight kg	Galvanised	
			art.no.	€
170 x 750 x 385	1500	23	<b>958002</b> 1500	<b>420,-</b>
170 x 750 x 425	2500	24	958002 2500	<b>569,-</b>
180 x 750 x 490	5000	34	958002 5000	<b>899,-</b>
180 x 750 x 555	7500	38	958002 7500	<b>1.049,-</b>

9107

## BAUER Drum collection trays

- For storing drums and small containers
- Conformity declaration (ÜHP) in accordance with StawaR, approved for ignitable liquids of GHS categories 1-3 and aquatic pollutants of GHS categories 1-4
- Construction of 3 mm sheet steel, hot-galvanised
- **With galvanised grating (load bearing capacity 1000 kg/m²)**
- Ground clearance 100 mm
- **Pricing:** free kerbside delivery within Germany



956004 0005

956004 0004

### For 200 l drums

L mm	Width mm	Height mm	Weight kg	Collecting volumes l	Number of drums max.	art.no.	€
120	1200	365	72	215	2	<b>956004</b> 0002	<b>395,-</b>
120	1200	290	91	216	4	956004 0004	<b>455,-</b>
240	2400	250	132	222	4	956004 0005	<b>719,-</b>

9107

**COLLECT  
SHIP AND  
STORE**



**BAUER**  
Lift truck attachments  
and warehouse equipment  
176 pages  
Art.no. 019900 5634

Overview of all free manufacturers' catalogues  
on page 16/17



TOOL  
**WORN-OUT.**  
THAT WON'T  
**STOP YOU**

**BECAUSE YOU ARE ALWAYS PREPARED:  
SARA® GO TOOL DISPENSING SYSTEM.**

**THAT'S POWER TO PRODUCE**

**SARATOOLS.com**

**POWER TO PRODUCE**

A BRAND OF SARTORIUS WERKZEUGE