

MILLING



CATALOGUE AND TECHNICAL MANUAL 2010



SAFETY INSTRUCTIONS FOR USING POKOLM-VOHA MILLING CUTTERS AND END MILLS

1 prior to operations

- ⊕ touching sharp cutting edges with bare hands can cause injuries
- ⊕ never touch cutting edges without hand protection
- ⊕ wear protective gloves when removing tools from boxes
- ⊕ wear protective gloves when attaching tools to chucks or spindles
- ⊕ for heavy items use transport equipment and wear safety shoes
- ⊕ check tools for cracks before putting into chucks or spindles
- ⊕ ensure that tools are suitable for materials to be cut prior to usage
- ⊕ check rotation direction of machine spindle prior to usage
- ⊕ check balance of tools before starting machining operations
- ⊕ check fixture of tools in holders and arbors before starting operations
- ⊕ check fixture and ensure that materials are properly secured on machine tables before starting operations

2 during operations

- ⊕ always close the security doors of your machine tool before starting operations
- ⊕ never touch tools or workpieces during operations
- ⊕ avoid coming close to machine spindle with clothing
- ⊕ avoid shock loads with your tools
- ⊕ wear safety glasses and protective equipment
- ⊕ never modify tools and never use tools for operations other than authorized
- ⊕ speed and feed recommendations should be used as a general guide
- ⊕ adjust recommendation to materials to be cut and rigidity of machine, if necessary
- ⊕ if vibrations or unusual noises occur during operations, stop process immediately
- ⊕ observe tools during operation for wear and chipping
- ⊕ replace worn tools
- ⊕ if using cutting oils, ensure that proper fire protection exists

3 after usage

- ⊕ tools and workpieces are extremely hot immediately after operations; never touch them with your bare hands
- ⊕ the chips and burrs produced during operations are dangerous and could lead to injuries; never touch them with your bare hands
- ⊕ when regrinding tools, wear dustproof masks or respirators, because the grinding dust generated is dangerous to your health

General Information

With the publication of this catalogue, all previous editions are invalid.

Due to alterations of standards, the dimensions and designs may differ from those in previous catalogues and price lists. However, we will supply tools of earlier standard designs as long as stock lasts.

We expressly reserve the right to alter dimensions, no. and style of teeth, etc. due to new standards or new technical developments. The graphic representations of our products may not conform to every detail of the actual model supplied.

We take no responsibility for printing errors.

Imprint

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We want to simplify your problems:
Benefit from our additional services!

Electronic selection per 'click'

- ➔ All necessary information are only one 'click' away!
- ➔ [Read more on page 11.](#)

CD-ROM-Catalogue

- ➔ Extensive search functions
- ➔ CAD/CAM data exports
- ➔ [Detailed description on page 12.](#)

PREMIUMTOOLS. WE KNOW HOW.



POKOLM-VOHA.
FOR MAXIMUM PROFESSIONAL ADVICE.



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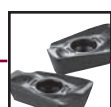
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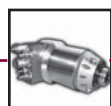
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Accessories



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Customized
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Operation Data



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Index

THIS IS HOW IT WORKS!

1

On these catalogue pages you will find all suitable arbors or adapters for your milling cutter bodies.

2

This symbol indicates an entirely new product group...

3

...and this symbol indicates a new product within a product group.

4

These columns show you the specific features of each item, which are in addition to the generally applicable features found on every right-hand page. All icons are explained on the Quickfinder card and on page 507.

5

These are the suitable accessories; their descriptions can always be found on the right-hand pages.

6

This is the dimensioned sketch for this item. The correspondance between dimensions and dimension descriptions can be seen from the adjoining list.

7

This symbol tells you about the availability of the tools.

8

Supplementary information about this particular product.

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SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

Slotworx® | size M

9

8

This new range is the all-purpose solution for square shoulder face milling and slotting. Applicable for inserts of line Slotworx®-M up to a corner radius of 2 mm.

1/2

Milling Cutter Bodies

DuoPlug®

P.O.-No.	d ₁	l	r	l ₁	l ₂	l ₃	d ₂	d ₃	z	Adapters + Accessories	Properties
2 16 267 SG	16	10	1-2	38	2.5	-	M 10	11	2	A, B	NEW
2 20 267 SG	20	10	1-2	40	2.5	-	M 12	18.6	2	A, B	NEW
3 25 267 SG	25	10	1-2	43	2.5	-	M 16	21.5	3	A, B	NEW
25 505 KP A > Page											
POKOLM 08 500 P B > Page											

Threaded shank end mill bodies

P.O.-No.	d ₁	l	r	l ₁	l ₂	l ₃	d ₂	d ₃	z	Adapters + Accessories	Properties
2 16 267	16	10	1-2	29	2.5	-	M 8	13.8	2	A, C	NEW
2 20 267	20	10	1-2	29	2.5	-	M 10	18	2	A, C	NEW
3 25 267	25	10	1-2	33	2.5	-	M 12	21	3	A, C	NEW
4 32 267	32	10	1-2	43	2.5	-	M 16	29	4	B, C	NEW
5 42 267	42	10	1-2	43	2.5	-	M 16	29	5	B, C	NEW
25 505 KP A > Page											
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Shell type milling cutter bodies

P.O.-No.	d ₁	l	r	l ₁	l ₂	l ₃	d ₂	d ₃	z	Adapters + Accessories	Properties
5 42 367	42	10	1-2	43	2.5	-	16	35	5	A, B	NEW
6 52 367	52	10	1-2	53	2.5	-	22	40	6	A, B	NEW
25 505 P A > Page											
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NEW latest items!

available as long as stock lasts

on request

stock item, subject to confirmation

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Indexable Inserts									
P.O.No.									
steel									
high-temperature alloys									
stainless steel									
cast iron									
non-ferrous metals									
carbide Grade									
Coating									
Size M r 1									
	04 67 820							K10	polished
	04 67 837							HSC 05	PVFN
	04 67 844							P40	PVGO
	04 67 848							P40	PVGO
	04 67 860							K10	PVTi
	04 67 860 D							K10	PVDiaN
	04 67 896							M40	
size M r 2									
	04 67 820 R20							K10	polished
size M HF									
	04 67 848 HF							P40	PVGO
	04 67 862 HF							K10	PVGP

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

103

Item description and additional information about this product group.

Tells you where you are and where to find which items.

A sample picture of this tool.

Tells you where to find additional information about inserts.

Material classification (see Operation Data chapter).

At a glance, all material suitability of cutting materials. Additional cutting parameters under Operation data.

Illustrations represent the different styles of inserts.

No endless searching: Find all the right cutting materials for your tools at a glance!

9

10

10

11

12

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16

14

15

16

POKOLM-VOHA



➞ WE ARE WHO WE ARE ...

... and we've been thinking!

The result is a connection between first-class tools and intensive professional consulting.

Because – as you know – a good tool alone doesn't automatically make a good milling application!

Since we believe in partnership, we treat and solve our customer's problems as if they were our own.

We offer much more than premium tools – we offer complete individual solutions, from planning strategies to CAD programming all the way to maintenance.

**We don't make it easy for ourselves.
We do a good job.**

With our practical and well-thought-out system solutions, we achieve very efficient results cooperating with our customers.

This saves you time and money right from the beginning.

Because first we analyse the tasks and objectives of the milling projects you are planning, then we develop workable and practice-oriented milling strategies for you.

We contribute to the optimum utilization of your resources and we are pleased about every euro we can save our customers.

Our highly qualified and experienced applications engineers are of course always prepared to make spontaneous, efficient modifications or to solve problems quickly, even after implementing tooling solutions and milling strategies.

As you can see, we do not do things by halves.

➞ **Our tested method:**

Reliability from the basic planning stage all the way to after-sales support. With Pokolm-Voha's know-how, you are well advised.

A PERFECT STRATEGY IS THE QUALIFICATION FOR AN EXCELLENT RESULT



The definition of task during the 7. European High-Speed-Machining-Award 2006 was to machine a form-insert of a chocolate easter-bunny of the pastry cook Roman Hauswirth of the city of Kittsee, according to pre-defined CAD-data. The component had a difficult geometry with various steep and shallow areas, which had to be machined in high precision surface finish and accuracy. Optimum machining of the component to meet the quality requirements was demanded.

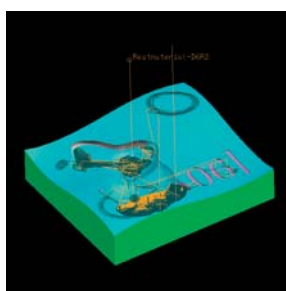


Material: 1.2342, hardness 52-54 HRC

The profile accuracy of the form cavity should be $\pm 0,015$ mm and a centre-line average roughness of $\leq 0,3$ Ra was required for the total surface.

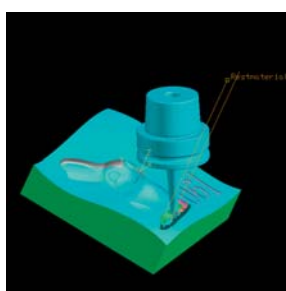
Surface finish of the parting surface should be 0,5-0,6 Ra.

Surface finish of the marking should be 0,8-1,0 Ra and the smallest tool used for this purpose was an end mill of 1 mm diam.



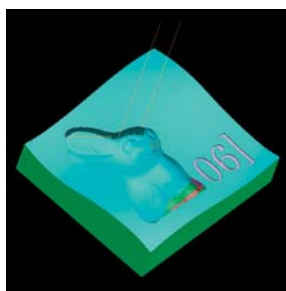
analysis of component "form-insert"

- ⊕ hardness of component is no problem due to its size
- ⊕ 90° walls have to be milled approx. 20 mm deep at the foot area of the bunny model, this means 10 times d1 for our 2 mm diam. end mill
- ⊕ there was not enough revolution supply for the engraving operation
- ⊕ but: a high speed spindle with 60000 rev/min would have had not enough performance for operating 12 mm diam.Trigaworx®-solid carbide end mills



strategy definition

- ⊕ the less tools, the better
- ⊕ avoiding tool-change costs and downtime
- ⊕ swivelling movement of the component allows shorter tools for machining foot area
- ⊕ machining strategy: z-constant and reciprocal milling
- ⊕ CAM-system: Tebis
- ⊕ Machine: Hermle C30
- ⊕ Tooling system: Pokolm-Voha



tooling strategy

- ⊕ Trigaworx®-end mills where possible, these tools are ideal for roughing those parts
- ⊕ milling of remaining material possibly with toric end mills
- ⊕ avoiding "zero"-speed situations at the ball centre
- ⊕ ball-nose end mills for finishing operations in the bunny-body
- ⊕ toric end mills for finishing the shallow parting-plane by setting angle of spindle allows larger stepover for targeted centreline average roughness

How you achieve a perfect form-insert with milling operations in 10 steps and further details about this HSM-award can be found in our flyer "Easter bunny mould: nobody is milling faster".

SERVICE A PART OF OUR IDENTITY

Excellent service, detailed consulting, and a comprehensive service package is part of the performance and quality, which you can expect from us. We want you to profit from our extensive experience.

That's why all of our staff are aware of their special responsibility for the total quality of our company.

Behind this is the idea of creating continual improvements. And never being satisfied. And finding even better solutions.

A lot of our inventions and innovations are admired and imitated by people throughout the industry. This makes us rather proud and tells us: We are on the right track.

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PREMIUMTOOLS. WE KNOW HOW.



YOUR ELECTRONIC QUOTATION PER 'CLICK'

If desired, we send our quotations or order-confirmations in PDF-data files per e-mail.

Example: your electronic quotation per 'click'.

Your advantage:

With only one click, you can receive all information about products selected, displayed on your screen

- ⊕ photo
- ⊕ drawing
- ⊕ all dimensions
- ⊕ accessories
- ⊕ suitable arbors, adaptors, inserts or solid carbide tools

All you need is internet connection!

Werkzeugsysteme Prozessoptimierung Frässtrategieberatung

pokoIm
FRASEINTECHNIK AG & CO. KG

Quotation

Document no. 2009-1006520
Reference no. 13.08.2009
Date D017200
Customer ID No. 123456789
Please indicate on all correspondence!

Our tax ident. no. 35157600403
Mode of shipment UPS
Terms of shipment
Contact Dirk Varnholt
Reference

Your reference John Doe
Your document no.
Your tax ident. no.
Your contact Dirk Varnholt
Extension +49 52 47 / 93 61-12
E-Mail dirk.varnholt@pokoim.de
Your sales rep. Gerhard Maurus
Extension +49 171 / 87 91 297
E-Mail Gerhard.Maurus@pokoim.de

Dear Mr. John Doe!

We thank you for your inquiry and would like to submit the following quotation to you.

Item	Item no.	designation	week	quantity	SU	price	total price	TC
1	32 200	Threaded shank end mill body for round inserts d1=32 d=18 r=8 D3=43.5 d2=M 16 d3=29 z=2 Internal coolant supply	09/23	1 pcs		114,34	114,34	0
2	04 16 842	Indexable round insert RDEX 1804 M01 d=18 r=8 r=8 P40 PPSR coated Further information at www.pokoim.com/artikel.php?id=04+16+842 Code number: 82000020	09/23	10 pcs		8,72	87,20	0

Further information at www.pokoim.com/artikel.php?id=32+200

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Die Gesellschaft ist eine KG mit Sitz in Harsewinkel, AG Gütersloh HRA 4055.
Persönlich haftende Gesellschafter sind die POKOIM Frästechnik Verwaltungs-GmbH mit Sitz in Harsewinkel, AG Gütersloh HRB 3651, Geschäftsführer: Nikola Pokoim, Marco Pokoim.

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FRASEINTECHNIK AG & CO. KG

COMPANY SHOP/PRODUCTS SERVICE NEWS DOWNLOADS WORLDWIDE CONTACT

4 32 200
Threaded Shank End Mill Body for Round Inserts

Print Page

Technical Data

Type: Milling cutter and end mill
Index for round inserts
d1=32 | d=18 | r=8 | D3=43.5
d2=M 16 | d3=29 | z=2
Internal coolant supply
d1=32 | d=18 | r=8 | D3=43.5
d2=M 16 | d3=29 | z=2
Internal coolant supply

Technical Drawing

Characteristics

Available

Accessories

35 500 Torx screw
T15 500 Torx
Interchangeable pin
T15 502 Torx magneising
Interchangeable blade
TV 2-6 Screwdriver torque

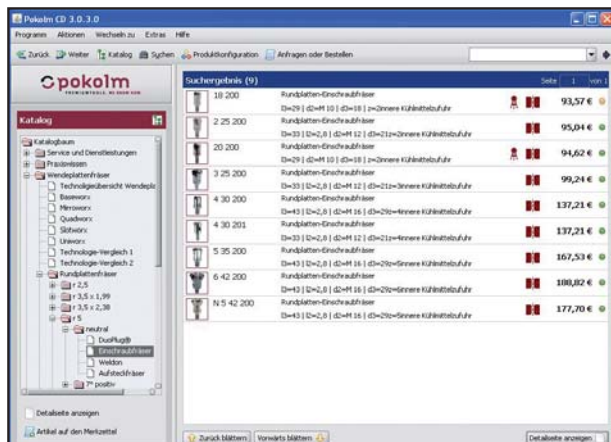
Only after registration, you are able to fill your basket!

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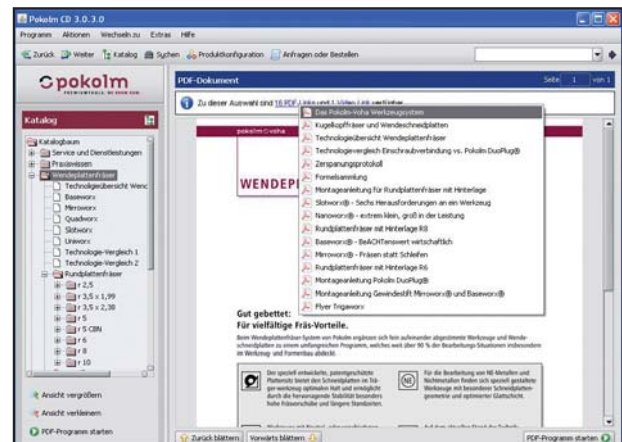
<http://shop.pokoim.de/pokoim/pokoim.de.asp?typ=artikel&id=4+32+200>

IN 300 SECONDS TO YOUR ENQUIRY THE POKOLM-VOHA CD-ROM-CATALOGUE

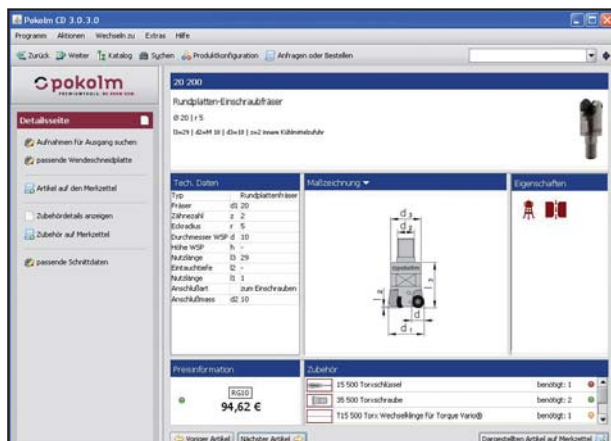
1. Browsing through the catalogue



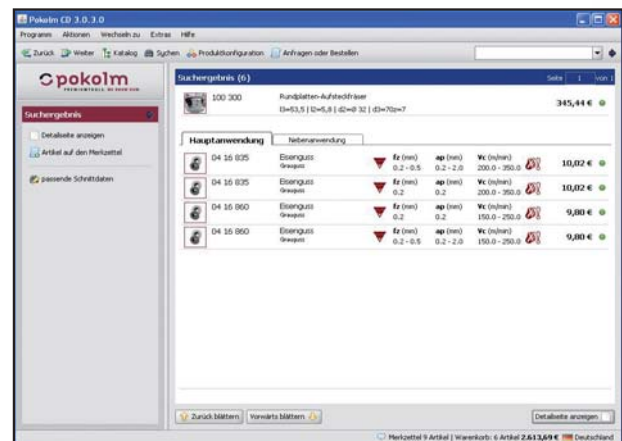
2. Direct access for PDF & video



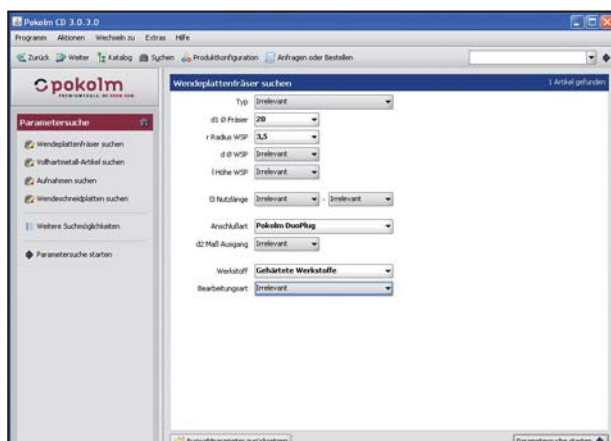
3. Detail page



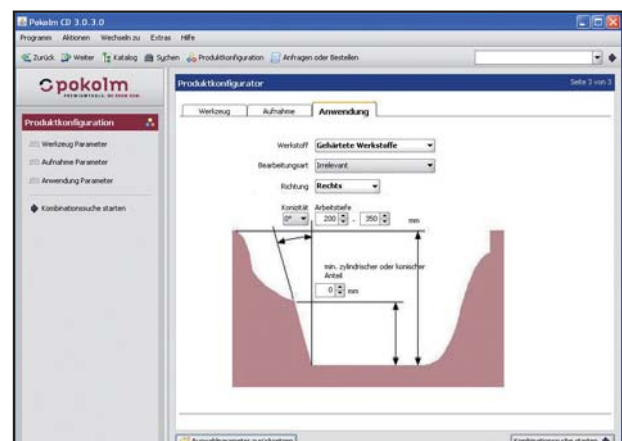
4. Operation data-overview



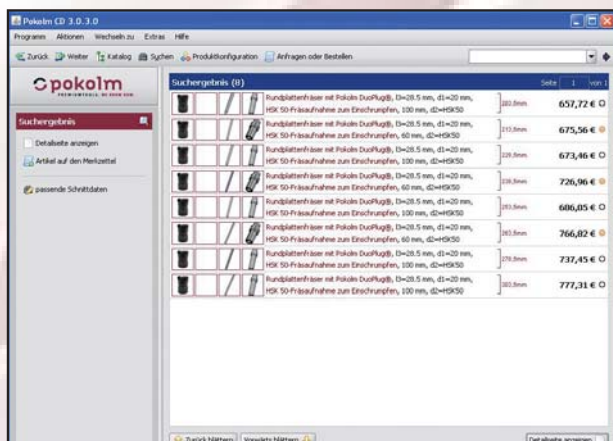
5. Search



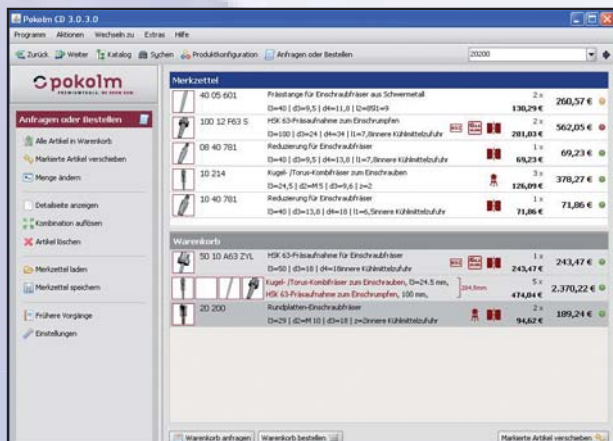
6. Product configurator



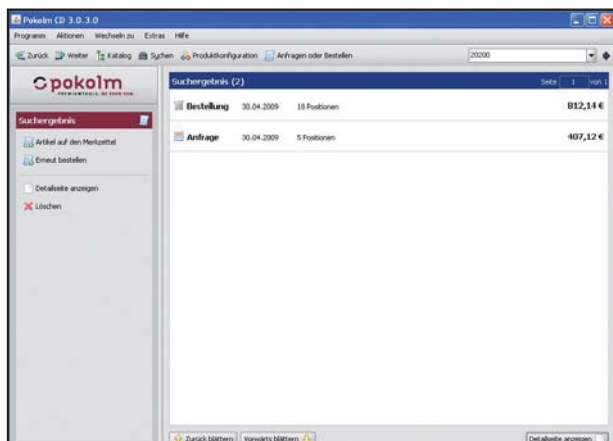
7. Results for combinations



8. Memos and basket



9. Pre-view



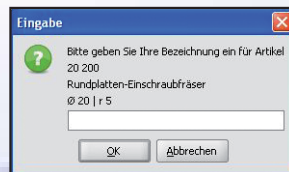
Extras

Formula calculator



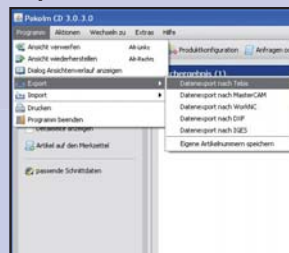
The operation data calculator offers fast calculation possibilities of feed rates, revolutions, cutting speeds and feeds per tooth - automatic presettings allow comfortable handling.

Your own code-no



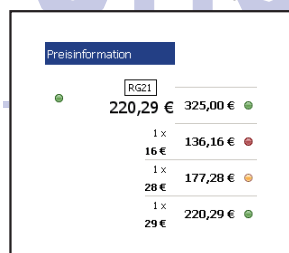
Input your own product code.

Export function



Possibility for exporting your product data to many popular CAD/CAM-programs.

Checking availability



Please check here, if the product required is available.

REFURBISHING OF PREMIUM SOLID CARBIDE END MILLS



**Premium solid carbide tools live longer:
... in more ways than one!**

The Pokolm-Voha-service team offers within this Workout-program for existing, already used Solid carbide tooling a wide variety of services:

- ⊕ reproduction
- ⊕ refurbishing
- ⊕ modification
- ⊕ recoating

We check, classify and mark every single tool individually, in order to ensure, that every customer receives his own tools back.

WORKOUT offers this service for all genuine Pokolm-Voha-tooling and also for non-Pokolm-Voha-tools, if its quality allows this.

You can send your tools for refurbishing, using the code "Workout" at any time to the following address:

**Voha-Tosec
Werkzeuge GmbH**

Schreinerweg 2a + 2b
D-51789 Lindlar

fon: +49 (0) 2266 4781-0
fax: +49 (0) 2266 4781-40

internet: www.voha-tosec.com
email: info@voha-tosec.de



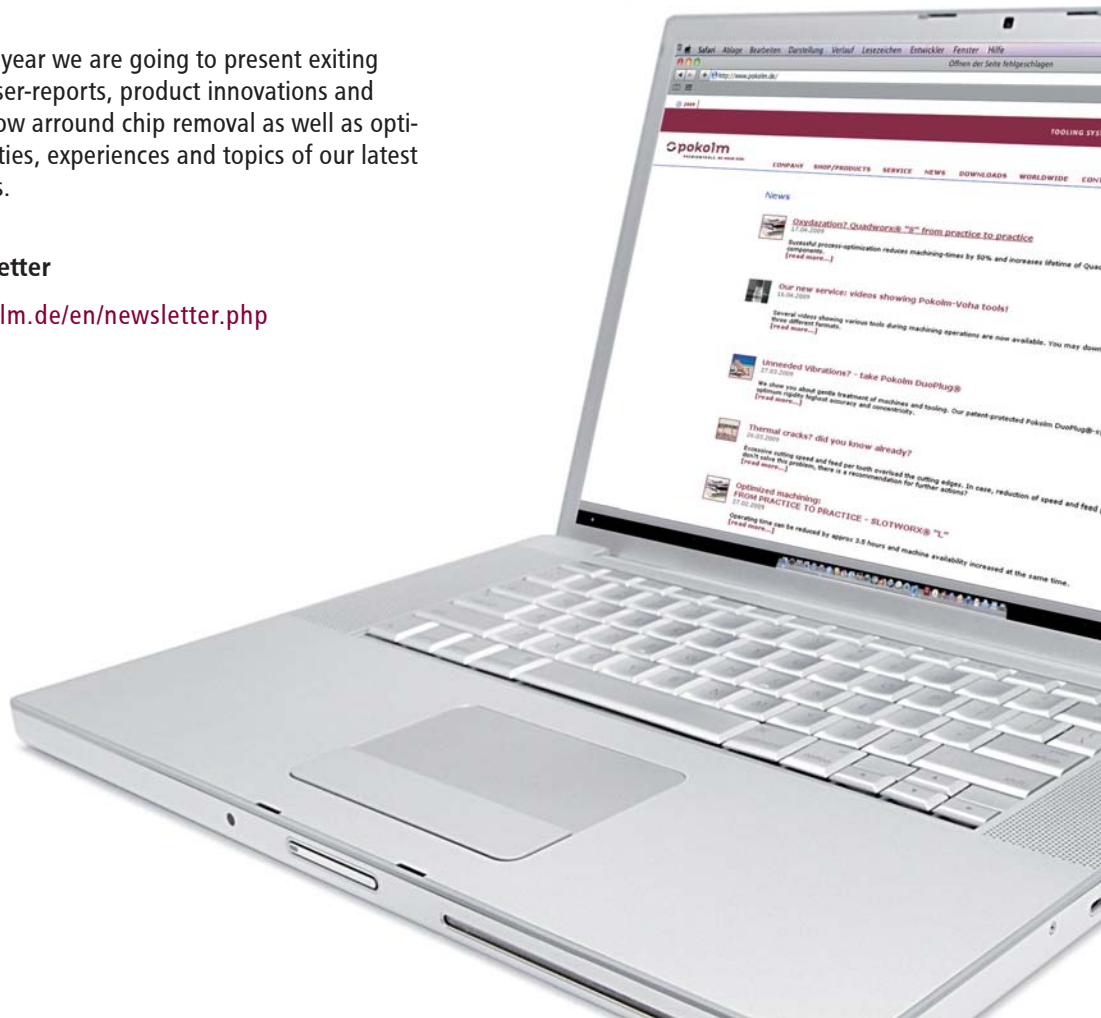
➔ Newsletter 2009

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PREMIUMTOOLS · WE KNOW HOW



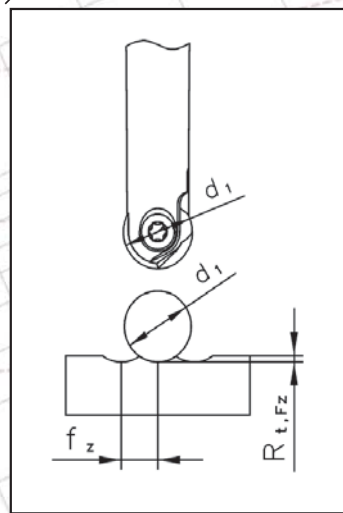
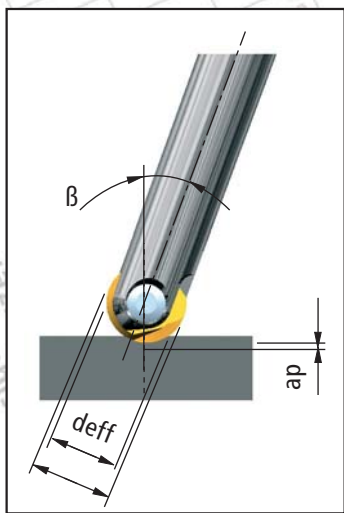
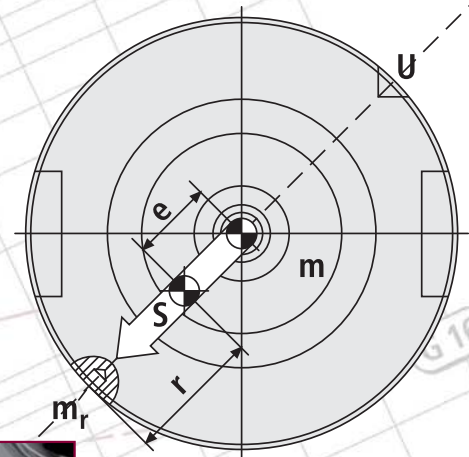
➔ **up-to-date information**

<http://www.pokolm.de/en/newsletter.php>



KNOW HOW

$$R_{th,ae} = \frac{d_1}{2} - \sqrt{\frac{d_1^2 - a_e^2}{4}}$$



KNOW-HOW

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Service

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End Mills

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Systems/Shrinking
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THE KNOW-HOW-CENTRE POKOLM ACADEMY

Knowledge takes the lead

Premium products are one side of the medal. The other side is focussing on the knowledge about more efficient, faster and more effective usage of your tooling system. This is the only way for engineering an optimized, integrated milling strategy. And it is your opportunity, to ensure a long-term unique competitive advantage.

However, there are many solution possibilities. Which one leads to maximum efficiency? How are you going to meet the challenges of the market? How are you going to map out the best possible strategy? The POKOLM-ACADEMY has the answers. Highly qualified experts instruct you during our professional seminars and workshops according to our philosophy: SOLUTIONS FOR PROBLEM-SOLVING. It is our obligation, not to leave you alone with our products, but to instruct you by dialog, based on partnership.

- ➔ Advantage of superior knowledge in order to stand out from the crowd.
- ➔ substantial product-knowledge for optimized full use of the product-opportunities.
- ➔ Latest milling strategies for a more efficient process-management.
- ➔ Securing and expansion of the market position.

Do you want to operate more economic?

Please ask your competent applications engineer. He will inform you individually about service offers and dates of our ACADEMY.

Continuing education means progress. We would be very pleased to welcome you soon in our know-how-centre in pleasant ambience.



We offer seminars and workshops among others:

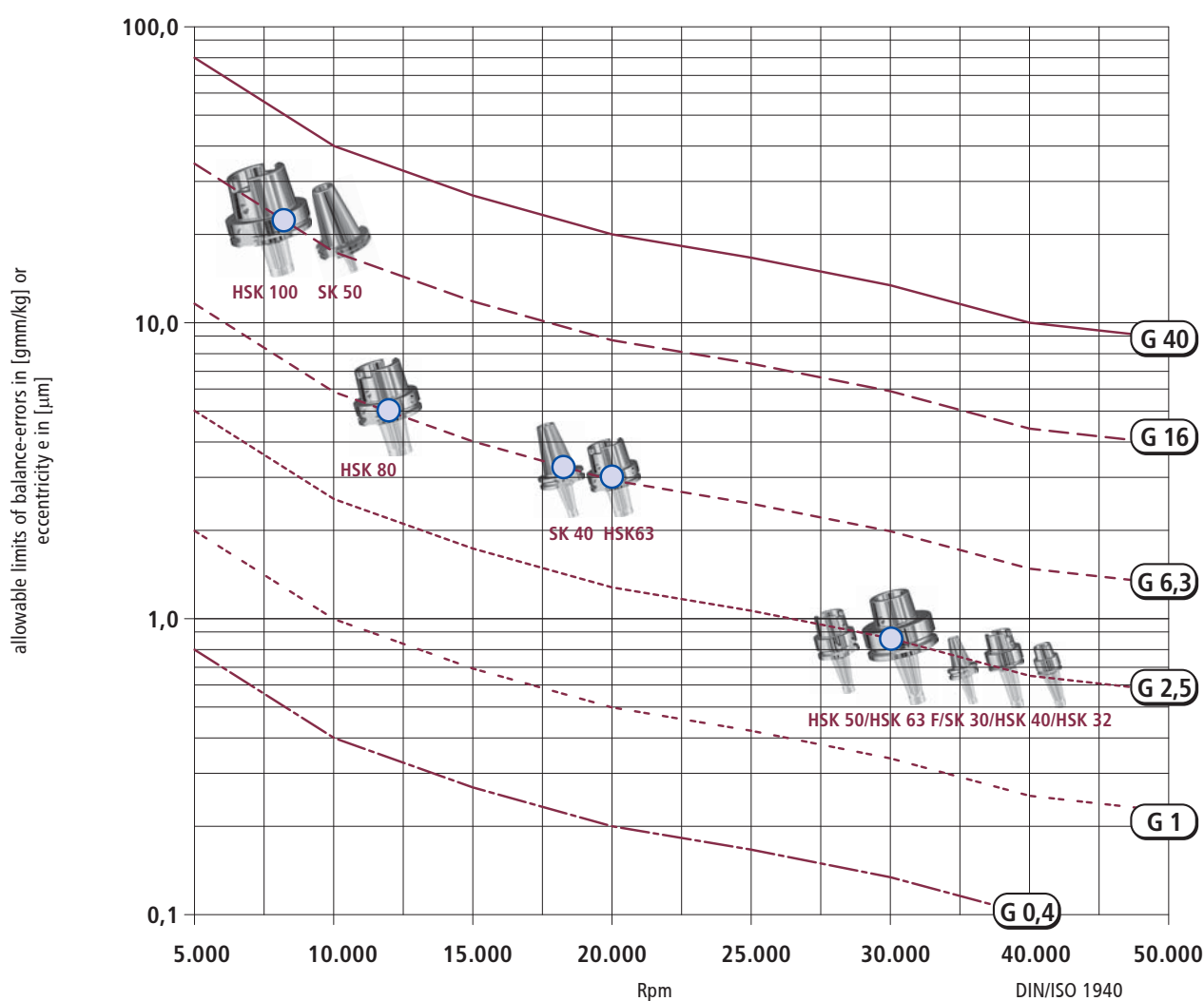
- | | |
|--|---|
| ➔ Presentation of the entire POKOLM-VOHA tooling systems | ➔ Processing of applicable milling strategies |
| ➔ Presentation of the POKOLM-VOHA range of services | ➔ Selection of adapted tooling systems |
| ➔ Basic information for spindle-systems and shrinking technology | ➔ Using of operation data via our CD-ROM and our CAM-interfaces |
| ➔ Theoretical applications-technologies for milling operations | ➔ Generation of optimized CNC-programs |
| | ➔ Milling demonstrations in practice |

BALANCING

Balance Grades of Pokolm Arbors

Kind of taper	SK/BT			HSK						
view										
size	30	40	50	32	40	50	63	63	80	100
form				all	all	all	all, except form F	form F	all	all
grade level	2,5	6,3	16	2,5	2,5	2,5	6,3	2,5	6,3	16
rpm	30.000	18.000	8.000	30.000	30.000	30.000	20.000	30.000	12.000	8.000

Deviations from this chart are possible – please tell us what your requirements are.



Calculations and definitions



Balancing grade classifications and typical applications:

G 0,4	e.g. microfinishing machines
G 1	e.g. low-power motors, driving gears for grinding machines
G 2,5	e.g. cutting tools, small arbors and adapters, electrical motors, turbines
G 6,3	e.g. cutting tools, arbors and adapters, machine tool parts
G 16	e.g. big arbors, cardan shafts, drive shafts
G 40	e.g. universal shafts, automotive wheels, crank gear drives

Formulas:

Calculation of remaining balance error in [gmm/kg]	Calculation of radian frequency in [1/s]	Calculation of balancing grade levels in [mm/s]	Calculation of compensation mass
$e = \frac{U}{m}$	$\omega = \frac{2 \cdot \pi \cdot n}{60}$	$G = e \cdot \omega = \frac{U \cdot \pi \cdot n}{m \cdot 30}$	$m_r = \frac{e \cdot m}{r}$

Definitions and dimensions:

G	= balancing grade level in [mm/s]	U	= balance error [m · e] in [gmm]
e	= remaining balance error in [gmm/kg] or eccentricity of center in [μm]	m	= rotor weight in [g]
ω	= radian frequency (2 · π · f) in [1/s]	F	= centrifugal force (U · ω) in [N]
f	= frequency (n/60) in [1/s]	r	= remaining balance error in [mm]
n	= rpm	m_r	= remaining balance error

Balance errors and balancing

Definition of balance error



Rotational axis $\neq$ mass axis
A balance error occurs when the rotational axis of a rotor part does not correspond to its mass axis.

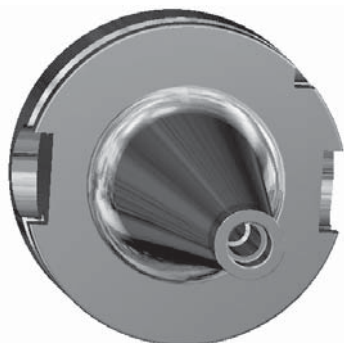


Rotational axis = mass axis

Reasons for Balance Errors:

- ⊕ Indexing seat for tool changer in SK and HSK
- ⊕ Driving slots in SK and BT
- ⊕ Driving slots in HSK- A, C, CE
- ⊕ any kinds of flats on tool shanks
- ⊕ Locking screws for tool shanks with flats
- ⊕ Non-uniform pitch on cutting tools
- ⊕ Collets and tightening nuts
- ⊕ Production tolerances

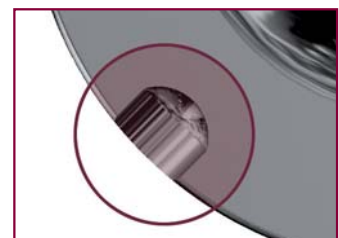
Balance errors can be eliminated either by adding material or by drilling corrective holes to remove material. See illustrations of corrective drill holes below:



Unbalanced arbor



Balanced arbor with corrective drill hole



➔ Balancing by drilling corrective holes. Sample calculations and detailed illustration, see next page.

Example of a calculation:

Shrinking Arbor HSK 63A: 50 08 A63 S

weight: 760 grams

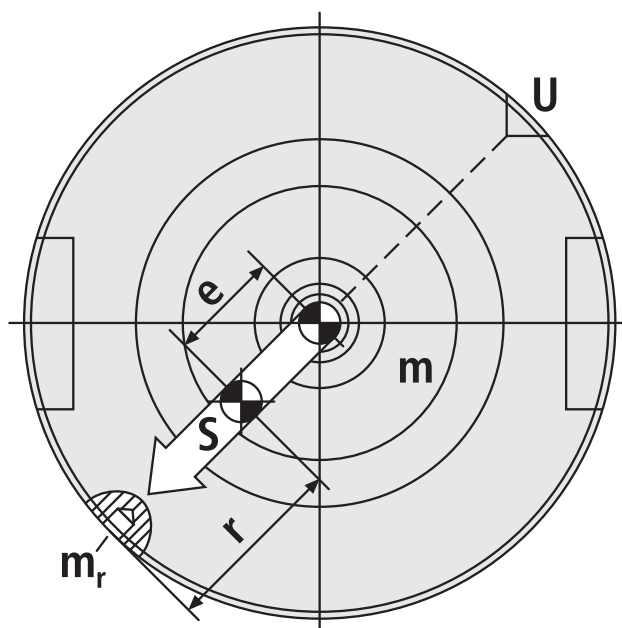
Taper radius: 31,5 mm

Balance grade: G 6.3 at 20,000 rpm

$$G = \frac{U \cdot 2 \cdot \pi \cdot n}{m \cdot 60} \Leftrightarrow U = \frac{G \cdot m \cdot 60}{2 \cdot \pi \cdot n}$$

$$U = \frac{6,3 \cdot 760 \cdot 60}{2 \cdot \pi \cdot 20.000} \Rightarrow U = 2,286 \text{ gmm}$$

$$e = \frac{2,286}{760} \Rightarrow e = 3 \mu\text{m}$$



Note to illustration: "S" = mass axis

Calculation of remaining balance error in example above:

$$m_r = \frac{m \cdot e}{r} \Rightarrow m_r = \frac{760 \cdot 0,003}{31,5} \Rightarrow m_r = 0,072\text{g}$$

By means of precision balancing, the remaining balancing error has been minimized to 0.072 g (in relation to the taper radius of the arbor of 31.5 mm).

Your advantages – why this is such an important subject.



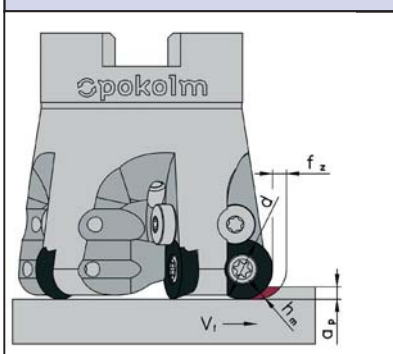
Balancing, particularly in connection with high concentricity, prevents your spindle from damage, because it decreases the centrifugal forces and reduces the formation of vibrations. This results in an extremely smooth operation, which greatly increases machining and component quality. In addition, it allows higher cutting parameters – both in high-speed milling and in conventional milling.

IMPORTANT PARAMETERS FOR MATERIAL REMOVAL: MEAN CHIP THICKNESS RATIO

Special features of milling cutter bodies with round inserts

The specific, comma-like shape of chips results in a chip cross section that starts with a thickness of f_z and goes down to zero (0). Therefore, it is best to use the mean chip thickness ratio h_m to calculate the operation data.

Calculation of Theoretical Mean Chip Thickness Ratio

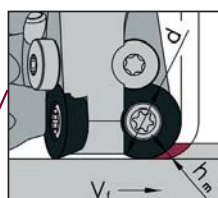


Formula:

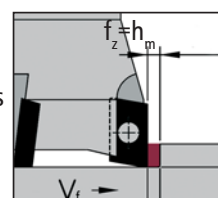
$$h_m \approx f_z \sqrt{\frac{a_p}{d}} * \sqrt{\frac{a_e}{D_c}}$$

Formula:

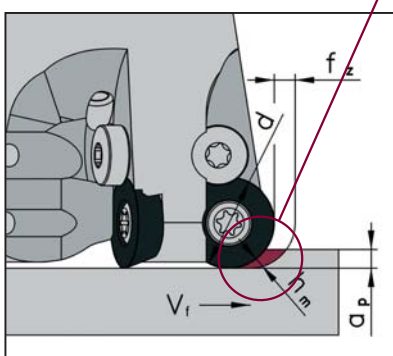
$$f_z \approx h_m \sqrt{\frac{d}{a_p}} * \sqrt{\frac{D_c}{a_e}}$$



Comparison to rectangular inserts



Machining example:



Milling cutter: 35 200
No. of effective teeth: 3
Requested h_m : 0,15
Size of insert: Ø 12 x 3,97 mm
Depth of cut a_p : 2
Width of cut a_e : 60%

$$f_z \approx 0,15 \sqrt{\frac{12}{2}} * \sqrt{\frac{35}{60\% * 35}} = 0,47 \text{ mm}$$

This means:

➔ Using round inserts results in an increase of the feed rate by a factor of 2.4!

Recommended mean chip thickness for round inserts:

WSP diam	5	7	10	12	16	20
h_m	0,07	0,1	0,15	0,15	0,2	0,25

Definitions and dimensions:

a_p depth of cut [mm]
 d diameter of insert [mm]

f_z feed per tooth in [mm]
 h_m mean chip thickness ratio [mm]

OPERATION DATA CALCULATOR

for mobile devices

Use our Operation data calculator, wherever you stay.

This mobile operation data calculator allows a fast calculation of all possible operation data via your mobile phone at any time.

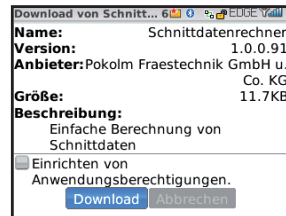
Feed rates, revolutions, speed or feed per tooth are calculated without any difficulty, an automatic menu- navigation is assisting your handling. For example: revolutions are automatically mentioned, if speed V_c and the cutter diameter have been put in.

This program package has a size of ~13 KB and is executable on all available mobile devices.

For software-installation, please call the following website via your mobile-phone-browser:

<http://downloads.pokolm.de/sonstiges/Schnittdaten-rechner.jar> (~13KB)

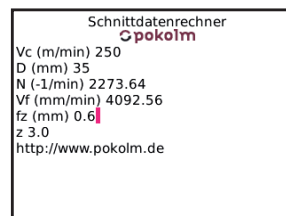
and download this software-package to your mobile-phone.



download program



start program



input data



special functions



SURFACE FINISH

The goal when finishing a component is, to avoid or at least minimize the necessity for manual retouching. However, many factors influence the surface finish of a milled component:

- ⊕ workpiece geometry, material
- ⊕ rigidity of the clamp and the machine
- ⊕ length of overhang and cutting data
- ⊕ precision, geometry and design of cutting tools and arbors

In addition to these points, the desired surface-roughness R_{th} definitively influences both the surface finish and the machining times needed for finishing. The well-informed selection of operation data to achieve a defined surface roughness saves valuable time in every finishing operation and ensures competitive machining times.

Machining example:

Material: 1.2312, SK40-machine	Surface to be machined: 150 x 200 mm
Milling cutter: 08 214 with $d_1 = 8$, $z = 2$	$n = 14000$ rpm $V_c = 350$ m/min

	from		resulting in:			
	f_z	a_e	V_f	surface roughness in [mm]	milling length in [mm]	machining time
kind of machining 1	0,08	0,08	2.240	0,0002	375.000	2 h 47 min
kind of machining 2	0,08	0,16	2.240	0,0008	187.500	1 h 24 min
kind of machining 3	0,16	0,16	4.480	0,0008	187.500	42 min
kind of machining 4	0,16	0,32	4.480	0,0032	93.750	21 min
kind of machining 5	0,32	0,16	8.960	0,0008	187.500	21 min

You can roughly say that:

- ⊕ Doubling either your width of cut or your feed rate reduces your machining time by 50 %.

$f_z = a_e$ results in:

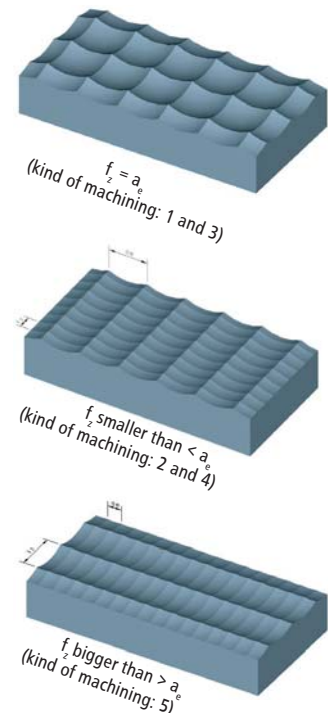
- ⊕ doubling both of these values reduces machining time to one quarter.
- ⊕ reducing f_z and a_e by half, however, increases surface smoothness fourfold.

Definitions and dimensions:

d_1 tool diameter in [mm]
 $R_{th,ae}$ surface roughness in feed direction in [mm]
 f_z feed per tooth in [mm]

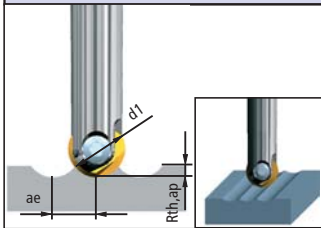
d_{eff} true tool diameter in action in [mm]
 $R_{th,tz}$ surface roughness in feed motion in [mm]
 B approach angle of tool axis in [°]

r tool radius in [mm]
 a_e width of cut in [mm]
 a_p depth of cut in [mm]



Collection of Formulas

1a Calculation of theoretical surface roughness in advance direction



Formula:

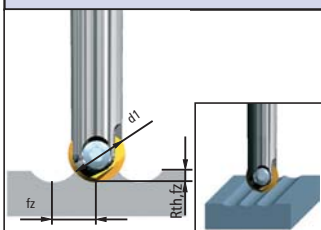
$$R_{th,ap} = \frac{d_1}{2} - \sqrt{\frac{d_1^2 - a_p^2}{4}}$$

Example:

$$\begin{aligned} d_1 &= 12 \\ a_p &= 0,2 \end{aligned}$$

$$R_{th,0,2} = \frac{12}{2} - \sqrt{\frac{12^2 - 0,2^2}{4}} = 0,000833$$

1b Calculation of theoretical surface roughness in feed direction



Formula:

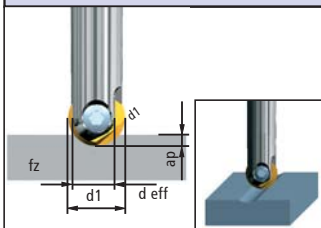
$$R_{th,fz} = \frac{d_1}{2} - \sqrt{\frac{d_1^2 - f_z^2}{4}}$$

Example:

$$\begin{aligned} d_1 &= 12 \\ f_z &= 0,2 \end{aligned}$$

$$R_{th,0,2} = \frac{12}{2} - \sqrt{\frac{12^2 - 0,2^2}{4}} = 0,000833$$

2a Calculation of true cutting diameter of ball nose end mills in the case of vertical axis



Formula:

$$d_{eff} = 2 \sqrt{a_p (d_1 - a_p)}$$

Example:

$$\begin{aligned} d_1 &= 12 \\ a_p &= 0,2 \end{aligned}$$

$$d_{eff} = 2 \sqrt{0,2 \cdot (12 - 0,2)} = 3,07$$

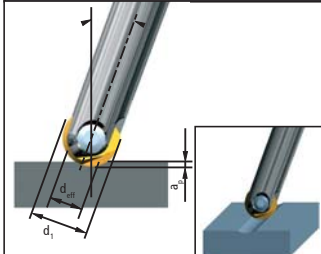
Don't waste your time on calculations:

Here is our chart for the true diameters of ball nose end mills depending on depth of cut:

	End mill diameter d_1 :											
a_p	1	2	3	4	5	6	7	8	10	12	16	20
0,1	0,60	0,87	1,08	1,25	1,40	1,54	1,66	1,78	1,99	2,18	2,52	2,82
0,2	0,80	1,20	1,50	1,74	1,96	2,15	2,33	2,50	2,80	3,07	3,56	3,98
0,3	0,92	1,43	1,80	2,11	2,37	2,62	3,84	3,04	3,41	3,75	4,34	4,86
0,4	0,98	1,60	2,04	2,40	2,71	2,99	3,25	3,49	3,92	4,31	5,00	5,60
0,5	1,00	1,73	2,24	2,65	3,00	3,32	3,61	3,87	4,36	4,80	5,57	6,24

2b

Calculation of true cutting diameter of ball nose end mills using an action angle of spindle


Formula:

$$d_{\text{eff}} = d_1 \cdot \sin \left(\beta + \arccos \left(1 - \frac{2 \cdot a_p}{d_1} \right) \right)$$

Formula applies to positive action angles

$$d_{\text{eff}} = 12 \cdot \sin \left(15 + \arccos \left(1 - \frac{2 \cdot 0,2}{12} \right) \right) = 5,97$$

Example:

$$\begin{aligned} d_1 &= 12 \\ a_p &= 0,2 \\ \beta &= 15^\circ \end{aligned}$$

True cutting diameters change when you use ball nose end mills in spindles with an action angle. Depth of cut (a_e) stays constant, but the area of the end mill diameter that is actually cutting is reduced. This requires another method of calculating the true cutting diameter.

Don't waste your time on calculations:

Here is our chart for true cutting diameters of ball nose end mills depending on the action angle and the depth of cut:

		End Mill Diameter d_1 :											
β	a_p	1	2	3	4	5	6	7	8	10	12	16	20
10°	0,1	0,73	1,17	1,55	1,89	2,21	2,52	2,82	3,11	3,66	4,20	5,23	6,22
	0,2	0,89	1,46	1,93	2,34	2,73	3,09	3,44	3,78	4,42	5,04	6,21	7,32
	0,3	0,97	1,65	2,19	2,67	3,10	3,51	3,90	4,28	4,99	5,67	6,95	8,16
	0,4	1,0	1,78	2,39	2,92	3,40	3,85	4,28	4,68	5,46	6,19	7,56	8,85
	0,5	0,98	1,88	2,55	3,13	3,65	4,13	4,59	5,03	5,86	6,63	8,09	9,45
15°	0,1	0,79	1,31	1,77	2,19	2,59	2,99	3,36	3,74	4,46	5,16	6,53	7,85
	0,2	0,93	1,57	2,12	2,62	3,08	3,53	3,99	4,38	5,19	5,97	7,47	8,92
	0,3	0,99	1,74	2,36	2,92	3,43	3,92	4,40	4,85	5,73	6,57	8,18	9,72
	0,4	1,00	1,86	2,54	3,15	3,71	4,24	4,74	5,23	6,17	7,06	8,76	10,38
	0,5	0,97	1,92	2,68	3,33	3,93	4,50	5,04	5,55	6,54	7,48	9,26	10,95
20°	0,1	0,84	1,43	1,97	2,47	2,96	3,43	3,89	4,34	5,22	6,09	7,77	9,42
	0,2	0,69	1,67	2,30	2,87	3,41	3,94	4,45	4,95	5,91	6,85	8,68	10,44
	0,3	1,00	1,82	2,51	3,14	3,74	4,30	4,85	5,39	6,42	7,42	9,35	11,20
	0,4	0,99	1,91	2,67	3,35	3,99	4,59	5,17	5,74	6,83	7,88	9,89	11,83
	0,5	0,94	1,97	2,79	3,51	4,19	4,83	5,44	6,03	7,17	8,27	10,36	12,37
25°	0,1	0,88	1,55	2,16	2,74	3,30	3,84	4,38	4,91	5,95	6,96	8,96	10,92
	0,2	0,98	1,76	2,46	3,10	3,72	4,32	4,90	5,48	6,59	7,69	9,82	11,89
	0,3	1,00	1,89	2,65	3,30	4,01	4,65	5,27	5,88	7,06	8,21	10,44	12,61
	0,4	0,97	1,69	2,78	3,53	4,23	4,91	5,57	6,20	7,44	8,64	10,95	13,19
	0,5	0,91	1,99	2,87	3,67	4,41	5,12	5,80	6,47	7,75	9,00	11,39	13,69
30°	0,1	0,92	1,65	2,33	2,98	3,61	4,23	4,84	5,44	6,62	7,79	10,08	12,34
	0,2	0,99	1,84	2,60	3,31	4,00	4,67	5,32	5,96	7,22	8,46	10,88	13,25
	0,3	0,99	1,94	2,76	3,52	4,26	4,96	5,66	6,33	7,65	8,94	11,46	13,91
	0,4	0,95	1,99	2,87	3,68	4,45	5,19	5,91	6,62	7,99	9,33	11,93	14,45
	0,5	0,87	2,00	2,94	3,79	4,60	5,37	6,12	6,85	8,27	9,65	12,32	14,91

Definitions and Dimensions:

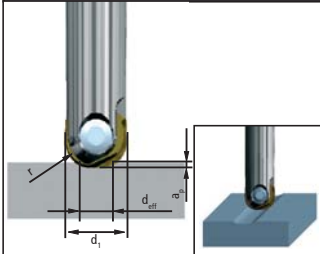
d_1 tool diameter in [mm]
 $R_{a,ae}$ surface roughness in feed direction in [mm]
 f_z feed per tooth in [mm]

d_{eff} true tool diameter in action in [mm]
 $R_{a,az}$ surface roughness in feed motion in [mm]
 β action angle of tool axis in [°]

r tool radius in [mm]
 a_e width of cut in [mm]
 a_p depth of cut in [mm]

2c

Calculation of true cutting diameter of toric end mills


Formula:

$$d_{\text{eff}} = (d_1 - 2r) + 2\sqrt{a_p(2r - a_p)}$$

Formula applies to positive approach angles

$$d_{\text{eff}} = (12 - 2 \cdot 5) + 2\sqrt{0,2 \cdot (2 \cdot 5 - 0,2)} = 4,8$$

Example:

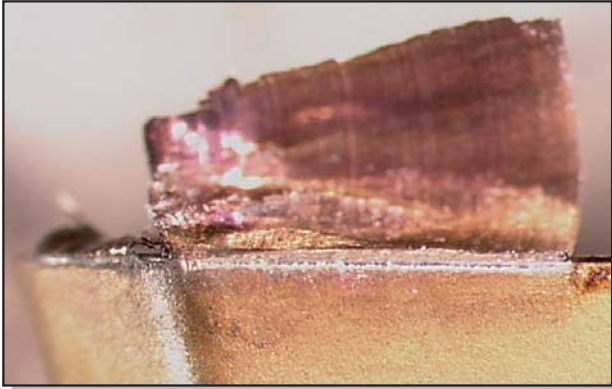
$$\begin{aligned} d_1 &= 12 \\ r &= 5 \\ a_p &= 0,2 \end{aligned}$$

Don't waste your time on calculations.

Here is our chart for true cutting diameters of toric end mills, depending on corner radius and depth of cut:

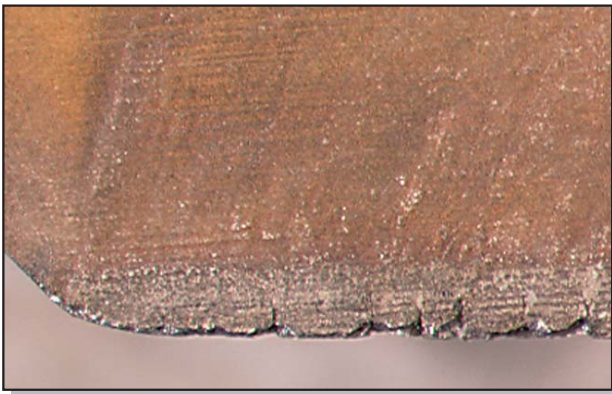
		End mill diameter							
r	a _p	6	8	10	12	15	16	20	25
2	0,1	3,25	5,25	7,25	9,25	-	13,25	17,25	-
	0,2	3,74	5,74	7,74	9,74	-	13,74	17,74	-
	0,3	4,11	6,11	8,11	10,11	-	14,11	18,11	-
	0,4	4,40	6,40	8,40	10,40	-	14,40	18,40	-
	0,5	4,65	6,65	8,65	10,65	-	14,65	18,65	-
2,5	0,1	2,40	4,40	6,40	8,40	11,40	12,40	16,40	-
	0,2	2,96	4,96	6,96	8,96	11,96	12,96	16,96	-
	0,3	3,37	5,37	7,37	9,37	12,37	13,37	17,37	-
	0,4	3,71	5,71	7,71	9,71	12,71	13,71	17,71	-
	0,5	4,00	6,00	8,00	10,00	13,00	14,00	18,00	-
3	0,1	-	3,54	-	-	-	-	-	-
	0,2	-	4,15	-	-	-	-	-	-
	0,3	-	4,62	-	-	-	-	-	-
	0,4	-	4,99	-	-	-	-	-	-
	0,5	-	5,32	-	-	-	-	-	-
3,5	0,1	-	-	-	6,66	9,66	10,66	14,66	19,66
	0,2	-	-	-	7,33	10,33	11,33	15,33	20,33
	0,3	-	-	-	7,84	10,84	11,84	15,84	20,84
	0,4	-	-	-	8,25	11,25	12,25	16,25	21,25
	0,5	-	-	-	8,61	11,61	12,61	16,51	21,61
4	0,1	-	-	3,78	-	-	-	-	18,78
	0,2	-	-	4,50	-	-	-	-	19,50
	0,3	-	-	5,04	-	-	-	-	20,04
	0,4	-	-	5,49	-	-	-	-	20,49
	0,5	-	-	5,87	-	-	-	-	20,87
5	0,1	-	-	-	3,99	-	-	11,99	16,99
	0,2	-	-	-	4,80	-	-	12,80	17,80
	0,3	-	-	-	5,41	-	-	13,41	18,41
	0,4	-	-	-	5,92	-	-	13,92	18,92
	0,5	-	-	-	6,36	-	-	14,36	19,36
7	0,1	-	-	-	-	-	4,36	-	-
	0,2	-	-	-	-	-	5,32	-	-
	0,3	-	-	-	-	-	6,05	-	-
	0,4	-	-	-	-	-	6,66	-	-
	0,5	-	-	-	-	-	7,20	-	-

KINDS OF TOOL WEAR IN MILLING OPERATIONS



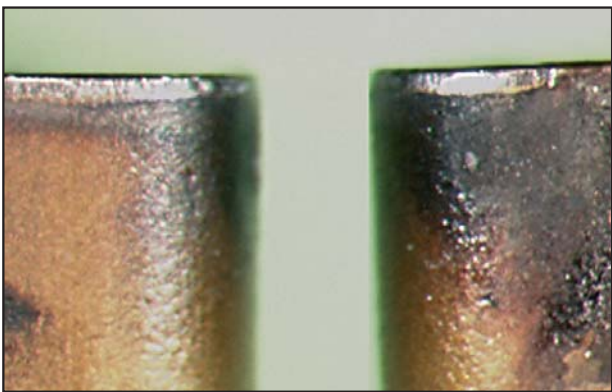
Built-up edges

Built-up edges cause poor surface finish and cutting-edge chipping when trying to remove material built-up.



Chipping

Small cutting-edge chipping leads to poor surface texture and excessive flank wear.



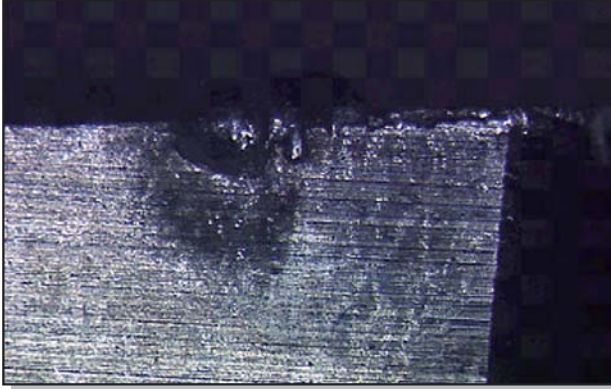
Flank wear

Rapid flank wear causes poor surface texture or inconsistency of tolerances.



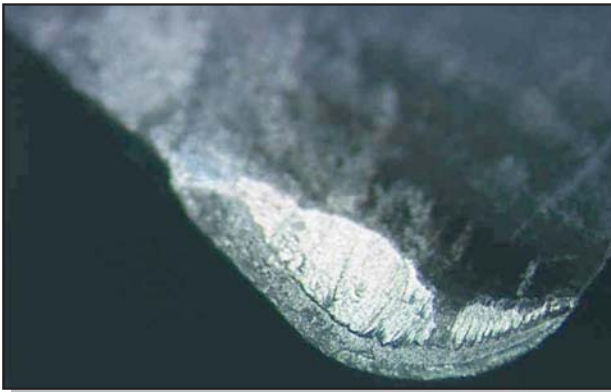
Thermal cracks

Small cracks perpendicular to the cutting edge cause chipping on workpiece and poor surface finish.



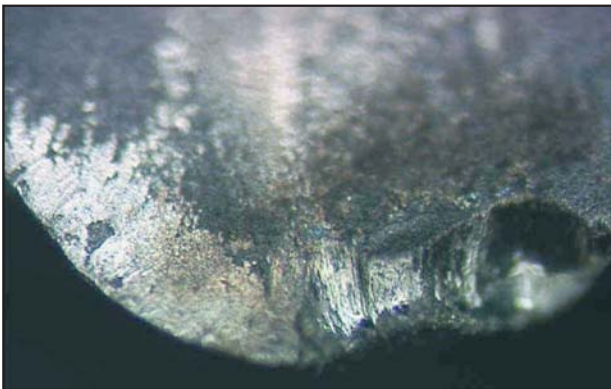
Notch wear

Notch wear causes poor surface texture and risk of edge breakage.

Milling Cutter
Bodies


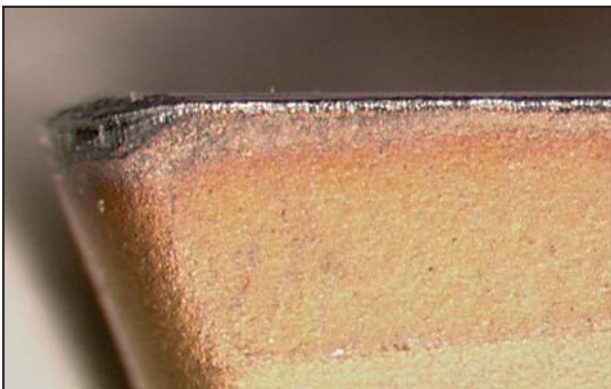
Crater wear

Excessive crater wear causes a weakened edge and poor surface finish.

Solid Carbide
End Mills


Insert/Edge fracture

Damages not only the insert but can also ruin the shim and workpiece.

High-Speed Spindle
Systems/Shrinking
Technology


Plastic deformation

Plastic deformation of edge, depression or flank impression, leading to poor chip control, poor surface and insert breakage.

Accessories

Customized
Products

Operation Data

Index

OPTIMIZING OF MILLING CONDITIONS AND TOOL LIFE

If you are not satisfied with your machining results, please check the following details:

- ⊕ have you selected the appropriate tool and insert diameter for your machine?
(In both cases it is better to select somewhat smaller diameters.)
- ⊕ have you selected the correct insert grade for the material to be machined?
- ⊕ do your selected operation data correspond to the recommended data in our catalogue?

Every milling operation is influenced by a very large number of very diverse factors. The following optimizing proposals are only an overview and do not claim to be complete.

For optimum operation data, specially selected for your specific machining application, please ask one of our applications engineers.

Wear and tool life

(see also our page "kind of tool wear")

A certain amount of wear during a milling operation is normal. However, if wear occurs after a very short machining time, please consider the following steps:

kind of tool wear	possible causes and solutions
Built-up edge	⊕ If your cutting speed is too low or your selected feed per tooth too small: this can lead to built-up chips on your cutting edges. ⊕ If your rake angle or your cutting edge are not optimal, there is a possibility for using our inserts with concave moulding or you might use milling cutter bodies with positive rake angle. ⊕ If your coolant supply is not optimal, chips starting to weld on your cutting edge. Your coolant flood should be strong enough to reach the point of cutting and can care for sufficient heat removal also. ⊕ Partly, the use of a different coating leads to improvements.
Edge chipping	⊕ If your cutting speed is too low or your selected feed per tooth too small: this can lead to edge chipping. Increasing or reducing those values can achieve improvements. ⊕ Also a tougher carbide grade reacts against edge chipping. ⊕ A softer cut of an insert with concave moulding or a cutter with positive rake angle might also solve these problems. ⊕ A too large depth of cut is an unnecessary stress. Often, reducing of your ap-value and increasing of speed Vc ends up in better results.

kind of wear	possible causes and solutions
Thermal cracks	⊕ Increased speeds and increased feeds per tooth excessively stress the cutting edge. If there is no improvement after reduction of the feed rate, following actions are possible: ⊕ by selecting a smaller setting angle, the position of the insert towards the component gets improved. ⊕ Thermal cracks can also result from heavy temperature changes at the cutting edge. Dry machining as well as sufficient coolant flood can put things right.
Notch wear	⊕ When notch wear occurs, milling chips "grind" material out of the insert at the deepest point of the cutting depth. Reducing of speed and feed rates provide a better chip removal as well as a tougher carbide grade. ⊕ Selecting a smaller setting angle and varying of the cutting depth work against those problems. ⊕ In case, notch wear is created by burr formation, the alteration of the operation angle of the milling cutter can improve the situation.
Crater wear	⊕ Crater wear is a thermal problem. In case, coolant is not or not in sufficient quantity available at the cutting edge, it gets overheated immediately. The same effect occurs, when speed and feed are increased. ⊕ Selection of a more wear resistant carbide grade can also work against this problem of crater wear.
Edge fracture/ insert breakage	Reason for insert breakage or edge fracture is a mechanical overstressing of the insert. Reasons for that can vary: ⊕ incorrect mounting of the insert to the cutter body can result in an air gap. The contact surface of the insert gets too small or gets lost completely. ⊕ In case, an excessive wear is recognized, an early insert change might help. ⊕ In case, the cutting edge is overstressed, a reduction of cutting depth or selection of a more rigid cutter geometry might help, as well as selection of a tougher carbide grade. ⊕ Please try to achieve a better proportion from cutting depth to cutting width by reduction of cutting depth and your sidesteps. ⊕ Also, excessive oscillations or vibrations can lead to insert breakage. Please read further instructions under "vibrations". ⊕ In case, insert breakage appears always at the same spot in your component, you should check your programming. Perhaps there is a spot with suddenly changing cutting forces, or, in case of finishing operations, too much residual material has been left.
Plastic deformation	⊕ In case, increased cutting temperature and increased cutting forces occur at the same time, it might come to thermal and mechanical deformations of the cutting edge. In order to put things right, you better select a more wear-resistant carbide grade or you look for a considerably increased improvement of your coolant supply.
Flank wear	⊕ Excessive flank wear results from increased speed and a too low feed rate. Adjust these values or select a more wear resistant carbide grade.

CIRCUMSTANCES WITH A NEGATIVE INFLUENCE ON A MILLING OPERATION

Factors, which affect milling results negatively:

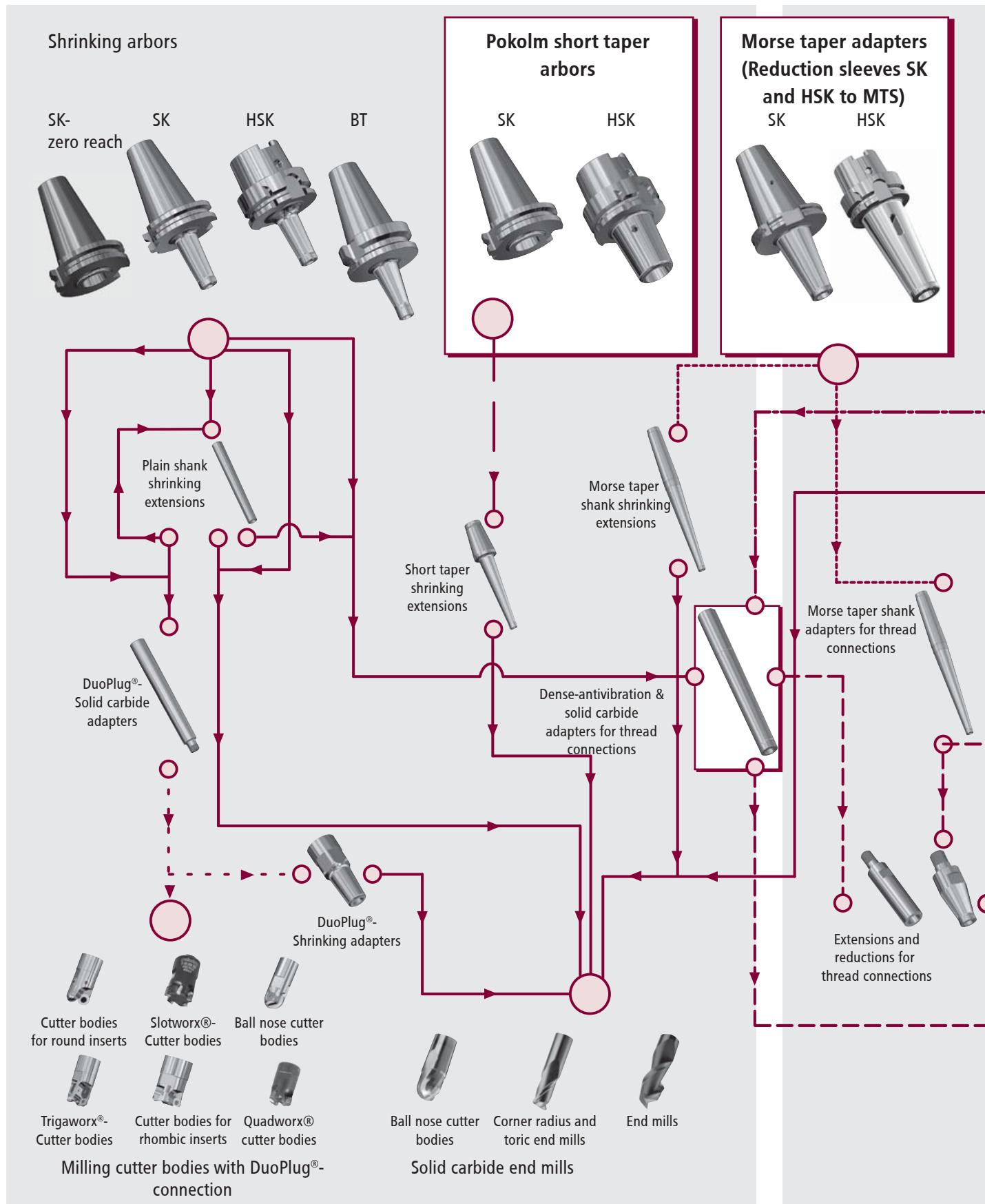
kind of wear	possible causes and solutions
burr formation	⊕ Dull cutting edges lead to burr formation. Positive insert geometries (e.g. concave moulding) are able to correct this effect. ⊕ Unfavourable cutting force direction can be eliminated by selecting another entering angle.
sticking chips	⊕ In case of very soft and clogging materials, the use of inserts with coatings containing lubricating additives leads to better chip removal. If inserts, suitable for wet machining are used, the results with coolant floods are possibly better. Higher feed per tooth can also avoid sticking chips. Chips are getting thicker, can absorb more heat and reduce temperature rising of inserts.
overstressed machines	⊕ If overstressing of the machine appears, cutting pressure is too high. Common reason is selection of oversized milling cutters and/or oversized inserts. Reduce those parameters and select a more positive tool geometry (7°, 12° or 17°). In order to reduce cutting pressure, speed, feed per tooth and cutting depths can be decreased.
unwanted scratches/ repeated-cutting	⊕ Repeated cutting becomes apparent through unwanted scratches and surface scoring. Select smaller tooling or a smaller setting angle. Those actions reduce overstressing. Sometimes, the change of dull inserts already leads to relief and you better check your adjustment angle of your spindle.
poor surface finish	⊕ If vibrations (see next page) are not the reason for poor surface finish, it should be checked, if an axial run-out occurs, which can be eliminated by adjustment of spindle, tool holder or tool. ⊕ For plane faces, the use of inserts with chamfer instead of corner radius, or even special face milling cutters and appropriate inserts are recommended. ⊕ Or simply, feed per revolution is too high? Further information about surface finish, you are going to find in chapter "know how".
no chip flow	⊕ Optimum chip removal is essential in milling operations. Please care for sufficient pressure-air supply and care for avoiding recutting of already removed material. ⊕ Too small chip room can lead to swarf jamming. Use tools with fewer teeth and more chip room. ⊕ By reducing depth of cut, width of cut and feed per tooth, chips are getting smaller and chip flow is increased. ⊕ In case of soft and clogging materials, inserts and solid carbide end mills coated with lubricating additives and positive cutting geometries (e.g. concave moulding) put things right.

kinds of wear	possible causes and solutions
Vibrations/chatter Did you know: Vibrations cause more wear on cutting edges than the actual cutting process.	⊕ A possible reason is an unsuitable rigidity of the machine. If there is no possibility to change to a more rigid machine, you have to select smaller tooling. We have small inserts for unstable machines in our range. Reducing speed and/or depth of cut are other possibilities for improvements. ⊕ Further possibilities: avoid poor set-up, avoid long overhangs by reducing the length of your tool-combination. Our Pokolm-Voha CD-ROM catalogue can assist you in your selection. ⊕ Distinct improvement in rigidity results through use of vibration-reduced combinations like DuoPlug®, dense- antivibration adapters or monobloc arbors, because the number of interfaces is smaller. For SK50 machines, we recommend direct spindle mounting, using the flange contact surface of the machine. ⊕ For machining deep cavities with long overhang, we offer – in addition to the above-mentioned possibilities – special Trigaworx®-or Quadworx®-tooling with long reach and coarse tooth pitches ⊕ In case of unstable set-ups, you should change to a more rigid set-up where the elements are clamped directly on to the machine table. ⊕ Finally, vibrations can also originate from resonances. In this case, the problem can be solved by altering the speed, increasing feed per tooth or selecting a more positive cutter geometry.
Fracture of component	⊕ Component fractures due to increased cutting forces could be avoided by sharper cutting edges and more positive cutter geometries. ⊕ Probably, an unfavourable direction of cutting forces has to be altered. In that case, the change from climb milling to conventional milling could improve the situation. ⊕ Particularly, in brittle material, fracture can be avoided by chamfering the tool exit side of the component.

If our recommendations for optimizing are not successful, please don't hesitate to contact one of our applications engineers.

THE POKOLM-VOHA TOOL SYSTEM

over 500000 combination possibilities



—————	Shrinking Combinations	—————
—— ———	Short Taper Combinations	—— ———
-----	Morse Taper Combinations	-----
- - - - -	Thread Combinations	- - - - -
-----	Shell-type Combinations	-----
—————	ER Collet Combinations	—————
- . - . -	DuoPlug®-Combinations	- . - . -

Arbors for thread connections

SK

HSK

BT



ER Collet chucks

SK

HSK

BT



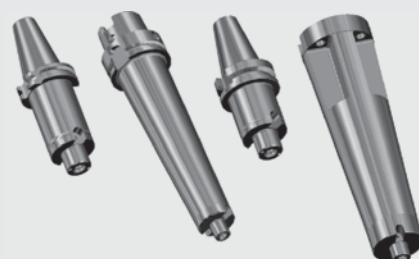
Arbors for shell-type milling cutter bodies

SK

HSK

BT

Direct spindle mounting



ER Shrinking extensions



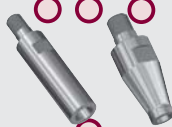
Shell-type adapters for thread connections



Cylindrical adapters for thread connections*



Extensions and reductions for thread connections



End mill bodies for thread connections

Plain shank end mills*



*Using suitable shrinking units you can combine all plain shank end mills, adapters, and extensions with shrinking adapters and arbors.

Shell-type adapters for thread connections



Shell-type extensions



Quadworx®



Slotworx®

Shell-type milling cutter bodies

MILLING CUTTER BODIES



Well Incorporated:

For multiple advantages in milling.

For Pokolm-milling cutter systems, all bodies are completed by a fine tuned insert-range, leading to an extensive choice of tooling, covering about 90% of every possible application in mould- and die-Making.



Our patent protected, specially incorporated insert seats offer optimum support and insert-life during all milling operations by outstanding rigidity, in particular, when using high feed rates.



For machining non-ferrous materials of all kinds, we offer specially designed tools with special insert geometries and optimum coatings with lubricating additives.



Tools with 0° axial rake angle (neutral) and with a variety of positive rake angles offer optimum cutting conditions for a wide range of all possible materials to be machined.



In keeping latest state-of-the-art developments: Nearly all the tools in the Pokolm-Voha range are equipped with an internal coolant supply.



The latest Pokolm DuoPlug®-adapter- and milling cutter system eliminates the looseness between adapter and cutter body. Together with the enormous retention forces and adhesive strength through the shrinking process, you reach a high quality surface finish, even for extreme milling operations and long reach overhang.



Milling cutters with our special 2-point contact milling design can be used for 90° plunge angles.



Reliability in case of roughing operations. The shims have 2 functions: shock absorber and protection at the same time. Increased process reliability with positive influences to smooth running are further characteristics of this product feature.



Optimized tool-geometries, carbide grades and coatings, specially developed for the characteristics of stainless-, acid- and heat-resistant materials, guarantee excellent machining results.

Further information about special features of our POKOLM-tooling systems are indicated on following pages.

MILLING CUTTER BODIES

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TECHNOLOGY OVERVIEW

MILLING CUTTER BODIES

⊕ INCREASED ECONOMIC EFFICIENCY

Our seven different diameters for round inserts alone, plus numerous additional geometries and sizes – combined with five different rake angles in our milling cutter bodies – provide optimum cutting conditions for almost every application you can think of.

Our neutral (0° axial rake angle) standard design inserts for universal use are supplemented by:



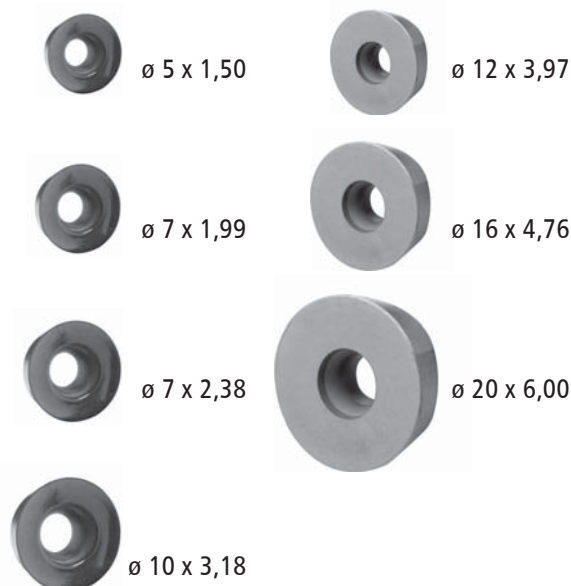
for machines with low input power and steels containing less than 10% chromium



for machining steels containing more than 10% chromium



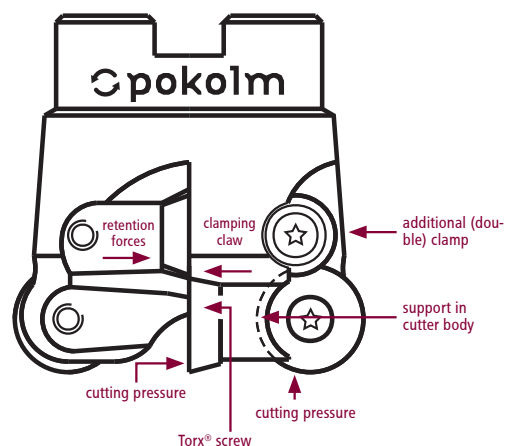
for exceptionally light cuts in face milling operations



Optimum load distribution

The patent-protected, specially developed insert seats in our milling cutter bodies absorb all axial and radial milling forces, because the insert is not only fixed with a Torx® screw, it is also supported by being embedded into the cutter body. Thus, the cutting pressure no longer acts on the screw alone, but is also absorbed by our milling cutter bodies.

Compared to open insert seats, our incorporated insert seats allow stronger teeth, clearly improving the rigidity of our milling cutters. This results in longer tool life and allows higher feed rates. Additional double clamps provide excellent support, even under extreme cutting conditions.



Reduced wear

Our chip spaces were specially designed for exceptionally easy chip flow, thus protecting both body and workpiece from damage. The supply channels for the coolant in arbors and cutter bodies are precisely coordinated with each other so that the coolant is conducted directly onto the cutting edge even under difficult cutting conditions.

Specially selected materials and extra-hard coatings offer higher tensile strength and heat resistance, making Pokolm tools and arbor systems unbeatable in durability and long-life-cycles.

UNIWORX®

➔ MULTIPLE PURPOSE MILLING CUTTERS FOR EXTENSIVE APPLICATIONS

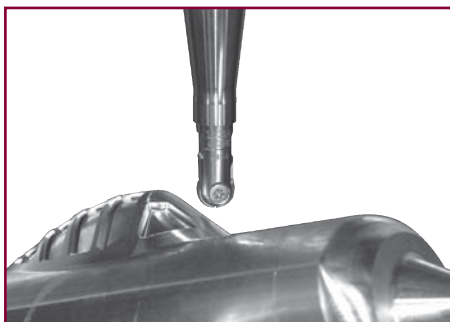


Uniworx® is our cutting tool range for ball- and toric indexable inserts. Its V-shaped insert-seat together with its positive and frictional connection of inserts, cutter bodies and locating screws care for best results in finishing passes.

Our new toric inserts, available in 2 selected coatings, are suitable for milling in hard and soft materials. Inserts with CBN-tips are also available and are suitable for finishing large-sized moulds. Together with our ball-nose inserts, this tooling range offers general purpose capabilities.

These special helical inserts, ground in one single set-up, leads to exceptionally easy cutting and smooth running.

These tools are designed for pre-finishing and finishing only.



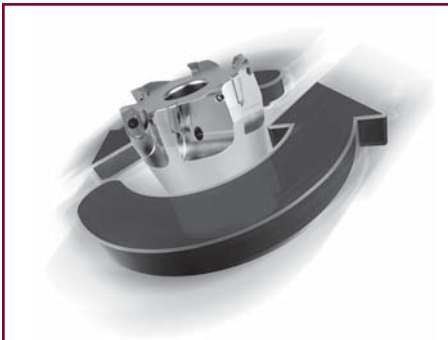
You benefit from these advantages:

- ➔ helical cutting edges for improved surface finish
- ➔ v-shaped insert seats and locating screw care for optimum indexing of inserts
- ➔ selected coatings and carbide grades are specially tuned for super-finish machining



SLOTWORX®

⊕ ANY GROOVE – IMPROVE YOUR CHIP-REMOVE



Slotworx®, our new square shoulder face milling and slotting cutter bodies for mould- and die-making as well as machine building offer multiple application possibilities for roughing and finishing of steel and non-ferrous materials, such as aluminium, graphite or plastics. Exceptionally precisely produced bodies secure excellent milling results.

Highest expectations for precision and accuracy are secured through ground and polished inserts. Considerably increased tool life is possible through latest coatings.

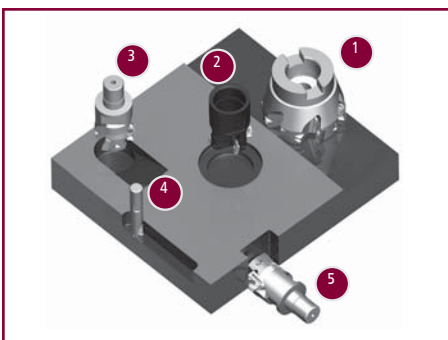
Our state-of-the-art helical cutting edges with positive rake angles lead to a constantly good edge rigidity, easy cutting and outstanding surface accuracy, as well as for 90°-shoulders, as for face milling.

Smooth surfaces also at the moulding bottom are possible through insert-integrated finishing lands. Cutting depths up to 7 mm are realistic and lead to enormous chip volume and increased operation fastness.



You benefit from these advantages:

- ⊕ universal operative range: roughing and finishing of steel and non-ferrous materials, such as aluminium, graphite etc.
- ⊕ face-, groove (slot)-, peripheral-, pocket- and circular milling as well as ramping
- ⊕ optimum coolant supply direct to the cutting edge
- ⊕ integrated finishing lands achieve outstanding surface finish



- 1 Slotworx® „L“ for face-milling
- 2 Slotworx® „M“ circular ramping
- 3 Slotworx® „L“ angular ramping
- 4 Slotworx® „S“ side- and shoulder milling
- 5 Slotworx® „L“ for grooving

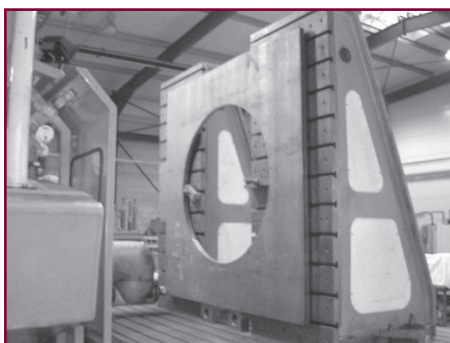
BASEWORX®

⊕ REMARKABLE EFFICIENT FACE MILLING CUTTERS



Baseworx® face milling cutters are superior for highly economic efficient milling in deep cavities and outstandingly suitable through its smooth running and its reduced power consumption. Suitable for roughing and finishing applications in steel and aluminium.

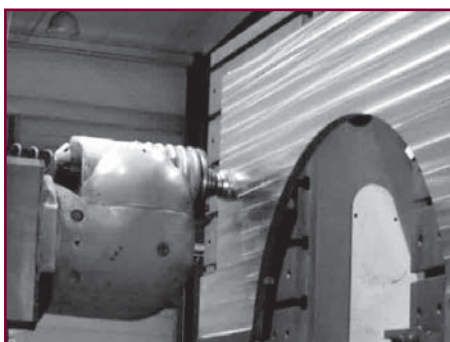
Face milling applications with 3 mm depths of cut and tooth loads up to 0.5 mm per tooth result in extreme chip volume. Depending on the machine tool available, chip volumes of up to 2000 cm³/min (122 cu.in/min) are possible. The surfaces achieved are so smooth, that a Mirroworx® finishing cutter can operate with optimum operation data for the remaining 0.1 mm path.



The capability achieved is huge: high metal removal and best surface finish and accuracy with high feed rates in short machining time = increased capacity and cost reduction!

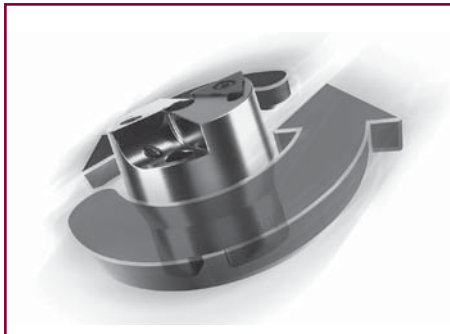
You benefit from these advantages:

- ⊕ 20° rake angle for reduced power consumption
- ⊕ approach angle k: approx. 43° for chamfering
- ⊕ in a cutting depth of ≤ 2.2 mm, all 8 teeth are applicable for cutting
- ⊕ also capable for instable components
- ⊕ increased operational reliability through incorporated inserts



MIRROWORX®

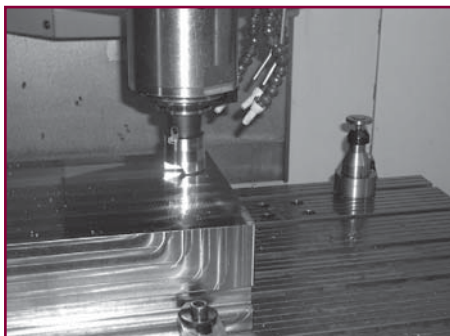
⊕ MILLING IN PLACE OF GRINDING



Mirroworx® is a face milling cutter for producing absolutely smooth and levelled surfaces in best possible efficiency.

This new tool range is designed with 2 adjustable insert seats and allows face milling also up to fronting and abutting vertical walls.

Mirroworx® face milling cutters achieve feed rates up to 10.000 mm/min and machined surfaces of up to 90.000 cm² (13950 sq.in.) with minimum tool costs through continuous development of new carbide grades at Pokolm.



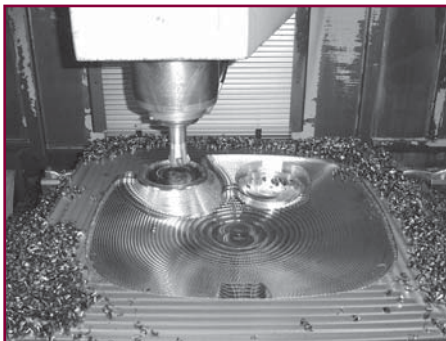
You benefit from these advantages:

- ⊕ surface roughness values $R_z < 2.5 \mu\text{m}$, this allows elimination of grinding processes; using grinding shops is unnecessary
- ⊕ an adjustment possibility allows control of possible inaccuracy of your machine-camber,
- ⊕ also capable for unstable components
- ⊕ particular smooth running
- ⊕ every of 3 cutting edges can be used reliably



QUADWORX®

⊕ SQUARED FEED RATES



QUADWORX® – this new Pokolm-development offers a high-feed milling possibility for universal applications in the field of high-feed milling.

Huge feed-rates when roughing steel, cast iron or tempered steel care for efficient machining of your components and now -this is NEW- also for stainless- and acid-resistant materials. This new range of Quadworx®-milling cutters is providing more efficiency and machining capacity.

Quadworx®-tooling are available with threaded shanks, shell type with plain bores as well as with our patent protected DuoPlug®-system for highest concentricity and maximum rigidity. All tools are provided with internal coolant supply to ensure maximum process reliability and secure chip removal when machining deep cavities.

You benefit from these advantages:

- ⊕ four cutting edges per insert offer high efficiency
- ⊕ maximum material removal and extremely easy cutting
- ⊕ using the 2nd clearance angles's surface and the 90° setting angle in the cutter body for positioning, twisting of inserts is eliminated
- ⊕ maximum process reliability, specially for interrupted cutting, by absolutely safe positioning of our inserts
- ⊕ with wiper edge and large radii, already in roughing operations
- ⊕ maximum surface accuracy is possible

TECHNOLOGICAL COMPARISON

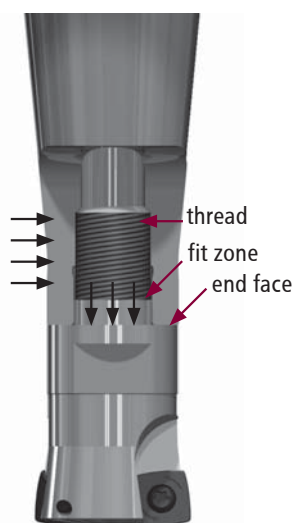
Thread Connection vs. Pokolm DuoPlug® Connection

Where the difference is:

Pokolm Thread Connection –
our high-performance standard

Pokolm Thread Connection

The black arrows show the retention and supporting forces.

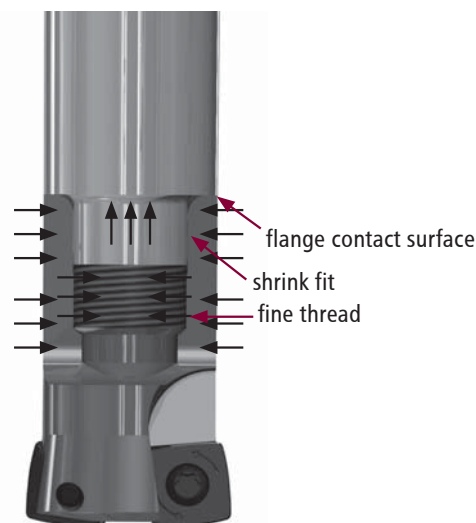


This standard thread connection is produced with the best tolerances possible using the latest technology. We maximize the efficiency of our Pokolm thread connections by optimizing our design of arbors, adapters, and milling cutter bodies.

Our patented protected DuoPlug® System –
the perfect increase

Pokolm DuoPlug®= Shrink and Screw

The black arrows show the retention and supporting forces.



Our Pokolm DuoPlug® system offers optimum rigidity and extremely high precision and concentricity. As a supplement to conventional thread connections, the retention and supporting forces between cutting tool and adapter act along the entire surface of the shrink fit and a large part of the shrink thread. For more information, please see the assembling and dismantling instructions for our DuoPlug® system in the "Operation Data" chapter.

The fact is:

DuoPlug® perfects the thread connection by means of greatly increased retention forces, resulting in the highest possible precision for extremely slim dimensions.

Pokolm Thread Connection – our high-performance standard

Performance

- ➔ no undercut, thus avoiding a rated break-point
- ➔ extremely precise fit zone and extremely precise flange contact surface
- ➔ better tensile strength and heat resistance because of the special materials and extra-hard coating
- ➔ for hundreds of tool changes
- ➔ optimized chamfers on arbors and adapters

Your Advantages

- ➔ increased process reliability
- ➔ universally applicable for all roughing and finishing operations
- ➔ better fatigue strength and red hardness
- ➔ lower tool costs because of longer tool life
- ➔ considerable increase in stability because of larger flange contact surface

Ideal Applications

- ➔ low-cost standard equipment for milling operations in shallow and medium-deep cavities
- ➔ especially for deep machining applications without vertical walls

Our patent protected DuoPlug® System – the perfect increase

Performance

- ➔ maximum precision and concentricity
- ➔ optimum stability
- ➔ absolutely backlash-free class of fits by screwed connection
- ➔ extremely precise and constant connection
- ➔ clearly increased retention forces compared to conventional thread connection
- ➔ better tensile strength and heat resistance because of special materials and extra-hard coating

Your Advantages

- ➔ longer tool life
- ➔ absolutely minimal vibrations with long overhangs
- ➔ renders top precision in finishing operations
- ➔ increased availability of tool system and increased process reliability
- ➔ improved performance in roughing operations
- ➔ better fatigue strength and red hardness

Ideal Applications

- ➔ for maximum precision in finishing operations
- ➔ roughing and finishing applications with long overhangs
- ➔ ideal for applications on vertical walls because of extremely slim arbor/adapter system



MILLING CUTTER BODIES FOR ROUND INSERTS

r 2.5 | neutral (0° axial rake angle)

Tools especially suitable for milling small dies and engraving.
The larger number of teeth allows much higher feed rates.

1/2 ▶

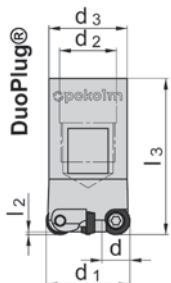
Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

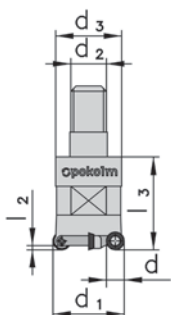
ref. pg. arbors
ref. accessories
features

DuoPlug®



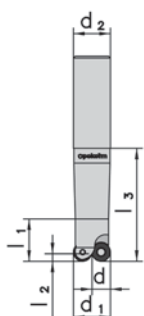
3 12 225 SG	12	5	2,5	24.5	1.3	-	M 7	10.8	3	310-311 A, B, C, D, E	    	
4 15 225 SG	15	5	2,5	28	1.3	-	M 10	14	4	310-311 A, B, C, D, E	    	
4 16 225 SG	16	5	2,5	28	1.3	-	M 10	15	4	310-311 A, B, C, D, E	    	
5 20 225 SG	20	5	2,5	28	1.3	-	M 12	18.5	5	310-311 A, B, C, D, E	    	
 21 500 A > Page 401	 POKOLM 06 500 B > Page 403			 TV 04-1 C > Page 404			 T6 500 D > Page 405			 T6 502 E > Page 405		

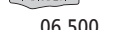
Threaded shank end mill bodies



2 10 225	10	5	2,5	19	-	-	M 5	9.5	2	312-313 A, B, C, D, E	    
3 12 225 M5	12	5	2,5	20.5	1.3	-	M 5	9.7	3	312-313 A, B, C, D, E	    
3 12 225	12	5	2,5	20.5	1.3	-	M 8	11.8	3	314-318 A, B, C, D, E	    
4 15 225	15	5	2,5	20.5	1.3	-	M 8	13.8	4	314-318 A, B, C, D, E	    
5 20 225	20	5	2,5	25.5	1.3	-	M 10	18	5	319-323 A, B, C, D, E	    
 21 500 A > Page 401	 06 500 B > Page 403			 TV 04-1 C > Page 404			 T6 500 D > Page 405		 T6 502 E > Page 405		

Plain shank end mill bodies



30 08 125	8	5	2,5	30	-	18	diam. 10	-	1	366-370 A, B, C, D, E	   
30 10 125	10	5	2,5	30	-	24	diam. 10	-	2	366-370 A, B, C, D, E	   
30 12 125	12	5	2,5	30	1.3	24	diam. 12	-	3	385 A, B, C, D, E	  
30 16 125	16	5	2,5	30	1.3	23.5	diam. 16	-	5	375-378 A, B, C, D, E	  
 21 500 A > Page 401	 06 500 B > Page 403			 TV 04-1 C > Page 404			 T6 500 D > Page 405			 T6 502 E > Page 405	

Indexable Inserts

for further details, see p. 140

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

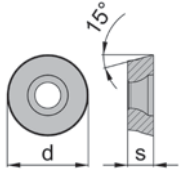
non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX



01 05 835



HSC 05

PVTi

01 05 850



P25

PVTi

01 05 870



cermet

PVTi

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

r 3.5 x 1.99 | neutral (0° axial rake angle)

Tools especially suitable for milling small dies or engraving. The larger number of teeth allows much higher feed rates.

Milling cutter bodies

catalogue no.

ref. pg. arbors
ref. accessories
features

2 12 235 SG	12	7	3,5	24.5	-	-	M 7	10.8	2	310-311 B, C, D, E, F	
3 15 235 SG	15	7	3,5	28	1.5	-	M 10	14	3	310-311 A, C, D, E, F	
5 25 235 SG	25	7	3,5	30	1.5	-	M 16	23.5	5	310-311 A, C, D, E, F	
 25 500 A > Page 401	 25 500 K B > Page 401	 07 500 C > Page 403		 TV 04-1 D > Page 404		 T7 500 E > Page 405		 T7 502 F > Page 405			

12 200	12	7	3,5	28.5	-	-	M 8	11.8	2	314-318 B, C, D, E, F	
12 200 M5	12	7	3,5	28.5	-	-	M 5	11.8	2	312-313 B, C, D, E, F	
3 15 235	15	7	3,5	28.5	1.5	-	M 8	13.8	3	314-318 A, C, D, E, F	
4 20 235	20	7	3,5	28.5	1.5	-	M 10	18	4	319-323 A, C, D, E, F	
5 25 235	25	7	3,5	28.5	1.5	-	M 12	21	5	324-329 A, C, D, E, F	
6 30 235	30	7	3,5	28.5	1.5	-	M 16	29	6	330-335 A, C, D, E, F	
 25 500 A > Page 401	 25 500 K B > Page 401			 07 500 C > Page 403			 TV 04-1 D > Page 404			 T7 500 E > Page 405	 T7 502 F > Page 405

Milling cutter bodies

catalogue no.

 d_1
 d
 r
 l_3
 l_2
 l_1
 d_2
 d_3
 z

ref. pg. arbors
ref. accessories
features

Plain shank end mill bodies

	30 12 100	12	7	3,5	30	-	23	diam. 12	-	2	385 A, B, C, D, E	
	 25 500 K A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405							

Indexable Inserts

for further details, see p. 142

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX

	01 07 835							HSC 05	PVTi
	01 07 840							P40	PVTi
	01 07 842							P40	PVSR
	01 07 850							P25	PVTi
	01 07 860							K10	PVTi
	01 07 870							cermet	PVTi

RDHX | concave moulding

	01 07 831P						K10	polished
	01 07 880 D						K10	PVDiaN
	01 07 880						K10	PVTi

major application
minor application


roughing



roughing



pre-finishing



pre-finishing



finishing



finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 3.5 x 1.99 | neutral (0° axial rake angle)

Tools especially suitable for milling small dies or engraving.
The larger number of teeth allows much higher feed rates.

3/3

Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

End mill bodies with plain shanks and flats

	40 12 100	12	7	3,5	40	-	19.5	diam. 16	-	2	375-378 B, C, D, E, F	
	60 12 100	12	7	3,5	60	-	19.5	diam. 16	-	2	375-378 B, C, D, E, F	
	80 12 100	12	7	3,5	80	-	19.5	diam. 16	-	2	375-378 B, C, D, E, F	
	30 15 100	15	7	3,5	30	1.2	19.5	diam. 12	-	3	385 A, C, D, E, F	
	N 30 15 100	15	7	3,5	30	1.2	19.5	diam. 16	-	3	375-378 A, C, D, E, F	
	 25 500 A > Page 401	 25 500 K B > Page 401	 07 500 C > Page 403			 TV 04-1 D > Page 404			 T7 500 E > Page 405		 T7 502 F > Page 405	

Indexable Inserts

for further details, see p. 142

catalogue no.

steel

high-temperature alloys

stainless steel

cast iron

non-ferrous materials

hardened steel

Carbide Grade

Coating

RDHX

	01 07 835							HSC 05	PVTi
	01 07 840							P40	PVTi
	01 07 842							P40	PVSR
	01 07 850							P25	PVTi
	01 07 860							K10	PVTi
	01 07 870							cermet	PVTi

RDHX | concave moulding

	01 07 831P						K10	polished
	01 07 880 D						K10	PVDiaN
	01 07 880						K10	PVTi



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems / Shrinking
Technology

Accessories

Customized
Products

Operation Data

Index

Milling cutter bodies

catalogue no.

d₁

d

r

l₃

l₂

l₁

d₂

d₃

z

ref. pg. arbors
ref. accessories
features

End mill bodies with plain shanks and flats

	40 15 100	15	7	3,5	40	2.6	23	diam. 16	-	2	375-378 A, B, C, D, E	☒
	60 15 100	15	7	3,5	60	2.6	23	diam. 16	-	2	375-378 A, B, C, D, E	☒
	80 15 100	15	7	3,5	80	2.6	22	diam. 20	-	2	379-381 A, B, C, D, E	☒
	100 15 100	15	7	3,5	100	2.6	22	diam. 20	-	2	379-381 A, B, C, D, E	☒
	 25 500 A > Page 401	 07 500 B > Page 403			 TV 04-1 C > Page 404			 T7 500 D > Page 405			 T7 502 E > Page 405	

Indexable Inserts

for further details, see p. 144

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX

	02 07 835							HSC 05	PVTi
	02 07 840							P40	PVTi
	02 07 842							P40	PVSR
	02 07 844							P40	PVML
	02 07 850							P25	PVTi
	02 07 860							K10	PVTi
	02 07 870							cermet	PVTi
	02 07 892							CBN for steel	

RDHX | concave moulding

	02 07 831P							K10	polished
	02 07 880							K10	PVTi
	02 07 880 D							K10	PVDiaN
	02 07 897							P25	PVGO

major application



roughing

minor application



roughing



pre-finishing



pre-finishing



finishing



finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 5 | neutral (0° axial rake angle)

The all-rounder:

Tools are applicable for a wide range of milling operations.

1/4 ▶

Milling cutter bodies

catalogue no.

d₁

d

r

l₃

l₂

l₁

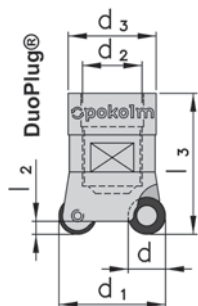
d₂

d₃

z

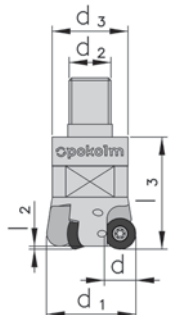
ref. pg. arbors
ref. accessories
features

DuoPlug®



20 200 SG	20	10	5	35	-	-	M 12	18.6	2	310-311 A, B, C, D, E	✓	✓	✓	✓	✓	✓
3 25 200 SG	25	10	5	35	2.8	-	M 16	23.5	3	310-311 A, B, C, D, E	✓	✓	✓	✓	✓	✓
35 500 A > Page 401	15 500 B > Page 403	TV 2-8 C > Page 404	T15 500 D > Page 405	T15 502 E > Page 405												

Threaded shank end mill bodies



20 200	20	10	5	29	-	-	M 10	18	2	319-323 A, B, C, D, E	✓	✓	✓	✓	✓	✓
2 25 200	25	10	5	33	2.8	-	M 12	21	2	324-329 A, B, C, D, E	✓	✓	✓	✓	✓	✓
3 25 200	25	10	5	33	2.8	-	M 12	21	3	324-329 A, B, C, D, E	✓	✓	✓	✓	✓	✓
4 30 201	30	10	5	33	2.8	-	M 12	21	4	324-329 A, B, C, D, E	✓	✓	✓	✓	✓	✓
4 30 200	30	10	5	43	2.8	-	M 16	29	4	330-335 A, B, C, D, E	✓	✓	✓	✓	✓	✓
5 35 200	35	10	5	43	2.8	-	M 16	29	5	330-335 A, B, C, D, E	✓	✓	✓	✓	✓	✓
N 5 42 200	42	10	5	43	2.8	-	M 16	29	5	330-335 A, B, C, D, E	✓	✓	✓	✓	✓	✓
6 42 200	42	10	5	43	2.8	-	M 16	29	6	330-335 A, B, C, D, E	✓	✓	✓	✓	✓	✓
35 500 A > Page 401	15 500 B > Page 403	TV 2-8 C > Page 404	T15 500 D > Page 405	T15 502 E > Page 405												

Milling cutter bodies

catalogue no.

d₁

d

r

l₃

l₂

l₁

d₂

d₃

z

ref. pg. arbors
ref. accessories
features

End mill bodies with plain shanks and flats

	40 20 100	20	10	5	40	-	23	diam. 20	-	2	379-381 A, B, C, D, E	
	60 20 100	20	10	5	60	-	23	diam. 20	-	2	379-381 A, B, C, D, E	
	80 20 100	20	10	5	80	-	23	diam. 25	-	2	382-383 A, B, C, D, E	
	100 20 100	20	10	5	100	-	23	diam. 25	-	2	382-383 A, B, C, D, E	
	120 20 100	20	10	5	120	-	23	diam. 25	-	2	382-383 A, B, C, D, E	
	 35 500 A > Page 401	 15 500 B > Page 403	 TV 2-8 C > Page 404	 T15 500 D > Page 405	 T15 502 E > Page 405							

Indexable Inserts

for further details, see p. 146

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX

	02 10 835							HSC 05	PVTi
	02 10 837							HSC 05	PVFN
	02 10 840							P40	PVTi
	02 10 842							P40	PVSR
	02 10 844							P40	PVML
	02 10 850							P25	PVTi
	02 10 860							K10	PVTi
	02 10 892							CBN for steel	

RDHX | concave moulding

	02 10 831P							K10	polished
	02 10 848							P40	PVGO
	02 10 880							K10	PVTi
	02 10 880 D							K10	PVDiaN
	02 10 897							P25	PVGO

major application



roughing



pre-finishing



finishing

minor application



roughing



pre-finishing



finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 5 | neutral (0° axial rake angle)

The all-rounder:

Tools are applicable for a wide range of milling operations.

3/4

Milling cutter bodies

catalogue no.

d₁

d

r

l₃

l₂

l₁

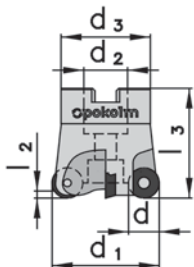
d₂

d₃

z

ref. pg. arbors
ref. accessories
features

Shell type milling cutter bodies



N 5 42 310

42

10

5

43

2.8

-

diam. 16

35

5

340-341

A, B, C, D, E

340-341

A, B, C, D, E

340-341

A, B, C, D, E

340-341

A, B, C, D, E

340-341

A, B, C, D, E

35 500
A > Page 401

15 500
B > Page 403

TV 2-8
C > Page 404

T15 500
D > Page 405

T15 502
E > Page 405

Indexable Inserts

for further details, see p. 146

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

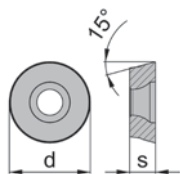
non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX



02 10 835



HSC 05

PVTi

02 10 837



HSC 05

PVFN

02 10 840



P40

PVTi

02 10 842



P40

PVSR

02 10 844



P40

PVML

02 10 850



P25

PVTi

02 10 860



K10

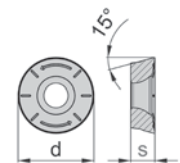
PVTi

02 10 892



CBN for steel

RDHX | concave moulding



02 10 831P



K10

polished

02 10 848



P40

PVGO

02 10 880



K10

PVTi

02 10 880 D



K10

PVDiaN

02 10 897



P25

PVGO

major application
minor application


roughing



roughing



pre-finishing



pre-finishing



finishing



finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 5 | 7° positive axial rake angle

The all-rounder:

Tools are applicable for a wide range of milling operations.

1/2

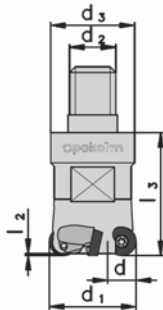
Milling cutter bodies

catalogue no.

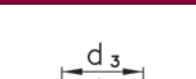
d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies

	3 25 200/7	25	10	5	32.5	2.5	-	M 12	21	3	324-329 A, B, C, D, E	
	6 42 200/7	42	10	5	42.5	2.5	-	M 16	29	6	330-335 A, B, C, D, E	
 35 500 A > Page 401	 15 500 B > Page 403			 TV 2-8 C > Page 404			 T15 500 D > Page 405			 T15 502 E > Page 405		

Shell type milling cutter bodies

	6 42 310/7	42	10	5	42.5	3.5	-	diam. 16	35	6	340-341 A, B, C, D, E	
	7 52 310/7	52	10	5	52.5	3.5	-	diam. 22	40	7	342-344 A, B, C, D, E	
 35 500 A > Page 401	 15 500 B > Page 403			 TV 2-8 C > Page 404			 T15 500 D > Page 405			 T15 502 E > Page 405		

Indexable Inserts

for further details, see p. 146

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

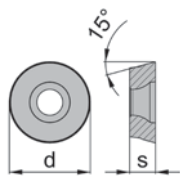
non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX



02 10 835



HSC 05

PVTi

02 10 837



HSC 05

PVFN

02 10 840



P40

PVTi

02 10 842



P40

PVSR

02 10 844



P40

PVML

02 10 850



P25

PVTi

02 10 860



K10

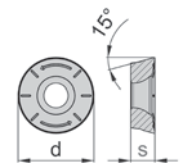
PVTi

02 10 892



CBN for steel

RDHX | concave moulding



02 10 831P



K10

polished

02 10 848



P40

PVGO

02 10 880



K10

PVTi

02 10 880 D



K10

PVDiaN

02 10 897



P25

PVGO

major application
minor application


roughing



pre-finishing

pre-finishing



finishing

finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 5 | 12° positive axial rake angle

Tools especially suitable for milling stainless steel with chrome and nickel content:

- exceptionally easy cutting
- low energy consumption
- for unstable clamping conditions

Milling cutter bodies

catalogue no.

d₁

d

r

l₃

l₂

l₁

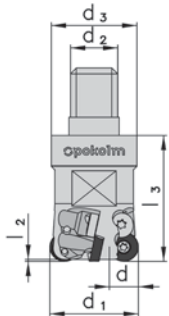
d₂

d₃

z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies



20 200/12	20	10	5	28.5	-	-	M 10	18	2	319-323 A, B, C, D, E, F	12°
3 25 200/12	25	10	5	32.5	2.5	-	M 12	21	3	324-329 A, B, C, D, E, F	12°
4 30 201/12	30	10	5	32.5	2.5	-	M 12	21	4	324-329 A, C, D, E, F	12°
4 30 200/12	30	10	5	42.5	2.5	-	M 16	29	4	330-335 A, B, C, D, E, F	12°
5 35 200/12	35	10	5	42.5	2.5	-	M 16	29	5	330-335 A, B, C, D, E, F	12°
 30 500 A > Page 401	 35 511 B > Page 401		 10 500 C > Page 403			 TV 1-5 D > Page 404			 T10 500 E > Page 405		 T10 502 F > Page 405

Indexable Inserts

for further details, see p. 146

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

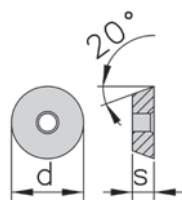
non-ferrous
materials

hardened steel

Carbide Grade

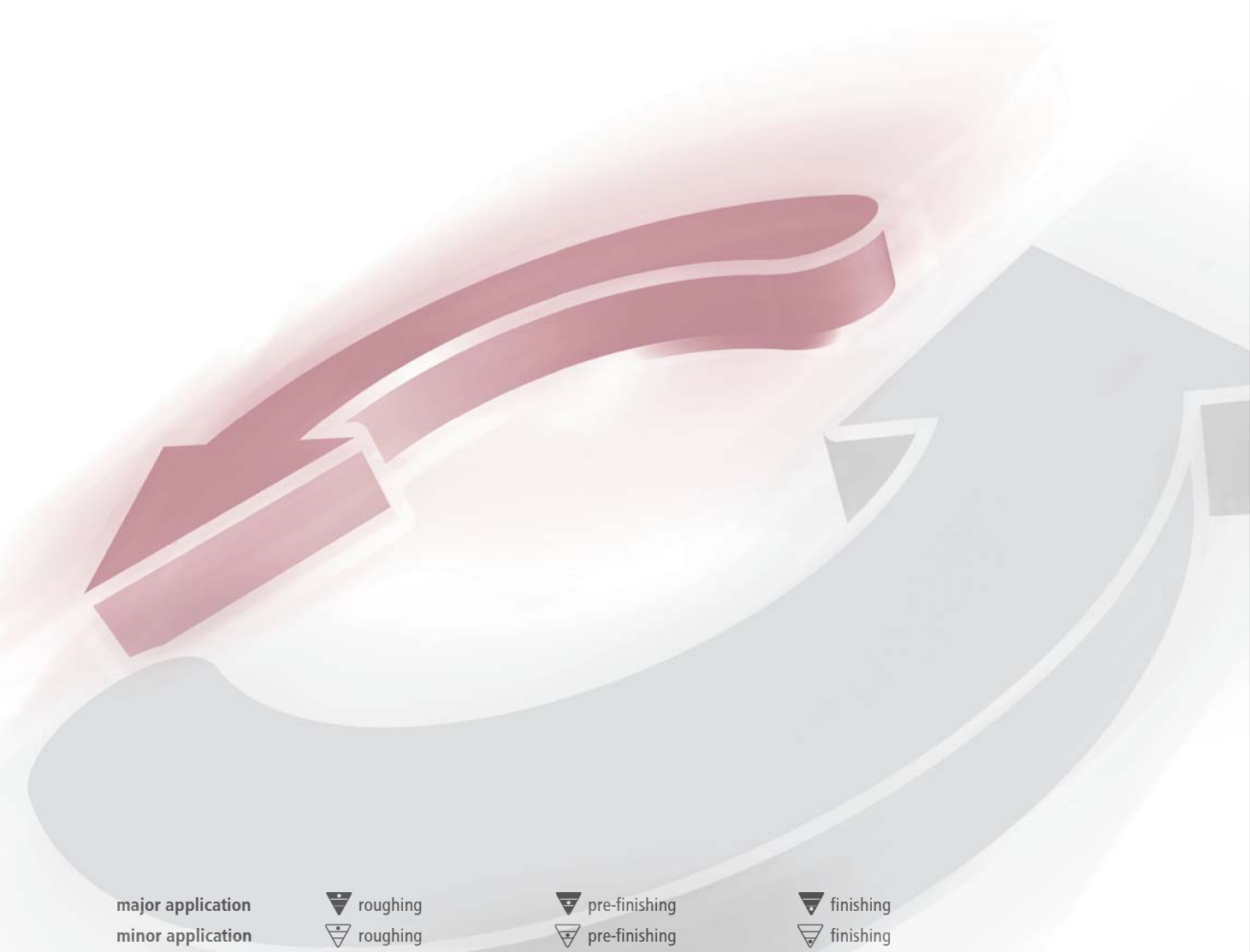
Coating

REHX



02 10 834							HSC 20	PVTi
02 10 835K							HSC 05	PVTi
02 10 841							P40	PVTi
02 10 895							P40	PVGM

pokoImCvoha
PREMIUMTOOLS. WE KNOW HOW.



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

Index



MILLING CUTTER BODIES FOR ROUND INSERTS

r 5 CBN | neutral (0° axial rake angle)

Specially designed for high-speed super-finish milling of hardened steel.

1/2 ▶

Milling cutter bodies

catalogue no.

d_1

d

r

l_3

l_2

l_1

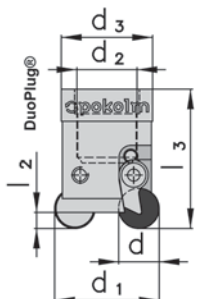
d_2

d_3

z

ref. pg. arbors
ref. accessories
features

DuoPlug®



POKOLM
10 500
A > Page 403

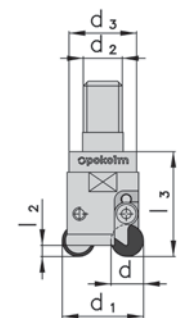
TV 2-8
B > Page 404

T10 500
C > Page 405

T10 502
D > Page 405

10 514
E > Page 405

Threaded shank end mill bodies



POKOLM
10 500
A > Page 403

TV 2-8
B > Page 404

T10 500
C > Page 405

T10 502
D > Page 405

10 514
E > Page 405

Indexable Inserts
for further details, see p. 146

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

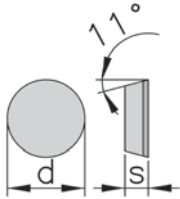
non-ferrous
materials

hardened steel

Carbide Grade

Coating

RPHN (CBN)



02 10 092

02 10 093



CBN for steel



CBN for cast
iron

major application
minor application



roughing



roughing



pre-finishing



pre-finishing



finishing



finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 6 | 7° positive rake angle | shim

- increased reliability against fractures during machining
- optimum protection of milling cutter body by shim
- in case of insert fracture, shims, screws and threaded bushes can be replaced separately, it is not necessary to buy a new body

1/2 ▶

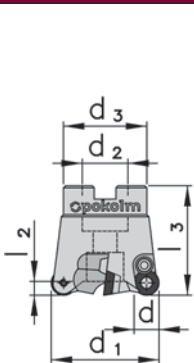
Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

Shell type milling cutter bodies

	42 310/7 HL	42	12	6	42	3.5	-	diam. 16	35	4	340-341 A - H	
	52 310/7 HL	52	12	6	52.5	3.5	-	diam. 22	40	5	342-344 A - H	
	66 310/7 HL	66	12	6	52.5	3.5	-	diam. 27	48	6	345-347 A - H	
	80 310/7 HL	80	12	6	52.5	3.5	-	diam. 27	60	7	345-347 A - H	
	 35 500 L A > Page 401	 35 510 B > Page 401			 35 500 I C > Page 403			 09 511 D > Page 403		 15 500 E > Page 403		 TV 2-8 F > Page 404
	 T15 500 G > Page 405	 T15 502 H > Page 405										

Indexable Inserts

for further details, see p. 150

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

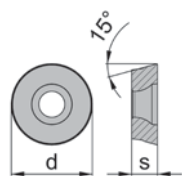
non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX



03 12 835K



HSC 05

PVTi

03 12 837K



HSC 05

PVFN

03 12 840K



P40

PVTi

03 12 842K



P40

PVSR

03 12 844K



P40

PVML

03 12 850K



P25

PVTi

03 12 860K



K10

PVTi

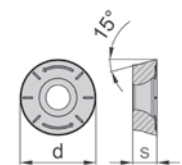
03 12 870K



cermet

PVTi

RDHX | concave moulding



03 12 831P



K10

polished

03 12 848K



P40

PVGO

03 12 880



K10

PVTi

03 12 880 D



K10

PVDiaN

03 12 897K



P25

PVGO

major application
minor application



roughing

roughing



pre-finishing

pre-finishing



finishing

finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 6 | neutral (0°) and 7° positive axial rake angles

The allrounder:

- for high-speed-machining centres
- for roughing and finishing operations

1/2 ▶

Milling cutter bodies

catalogue no.

d₁

d

r

l₃

l₂

l₁

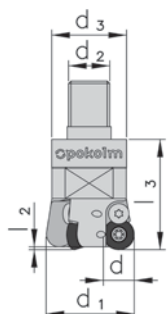
d₂

d₃

z

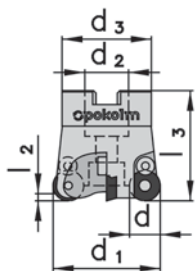
ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies



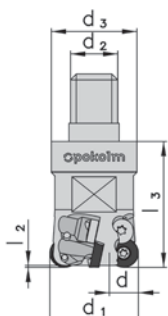
24 200	24	12	6	33	-	-	M 12	21	2	324-329 A, B, C, D, E, F	✓
35 200	35	12	6	43	3	-	M 16	29	3	330-335 A, B, C, D, E, F	✓
4 35 200	35	12	6	43	3	-	M 16	29	4	330-335 A, C, D, E, F	✓
42 200	42	12	6	43	3	-	M 16	29	4	330-335 A, B, D, E, F	✓
5 42 200	42	12	6	43	3	-	M 16	29	5	330-335 A, C, D, E, F	✓
35 500 A > Page 401	35 510 B > Page 401	15 500 C > Page 403	TV 2-8 D > Page 404	T15 500 E > Page 405	T15 502 F > Page 405						

Shell tp. mill. cutt. bodies | 0° axial rake angle



4 42 310	42	12	6	43	3	-	diam. 16	35	4	340-341 A, B, C, D, E, F	✓
5 42 310	42	12	6	43	3	-	diam. 16	35	5	340-341 A, C, D, E, F	✓
52 310	52	12	6	53	3.5	-	diam. 22	40	5	342-344 A, B, C, D, E, F	✓
35 500 A > Page 401	35 510 B > Page 401	15 500 C > Page 403	TV 2-8 D > Page 404	T15 500 E > Page 405	T15 502 F > Page 405						

Thr. sh. end mill bodies | 7° pos. rake angle



3 35 200/7	35	12	6	42.5	3	-	M 16	29	3	330-335 A, B, C, D, E, F	✓
4 35 200/7	35	12	6	42.5	3	-	M 16	29	4	330-335 A, C, D, E, F	✓
35 500 A > Page 401	35 510 B > Page 401	15 500 C > Page 403	TV 2-8 D > Page 404	T15 500 E > Page 405	T15 502 F > Page 405						

Milling cutter bodies

catalogue no.

d₁

d

r

l₃

l₂

l₁

d₂

d₃

z

ref. pg. arbors
ref. accessories
features

Shell tp. mill. cutt. bodies | 7° pos. rake angle

	52 310/7	52	12	6	52.5	3.5	-	diam. 22	40	5	342-344 A, B, C, D, E, F	7°
	66 310/7	66	12	6	52.5	3.5	-	diam. 27	48	6	345-347 A, B, D, E, F	7°
	80 310/7	80	12	6	52.5	3.5	-	diam. 27	60	7	345-347 A, B, D, E, F	7°
	35 500 A > Page 401	35 510 B > Page 401			15 500 C > Page 403			TV 2-8 D > Page 404			T15 500 E > Page 405	T15 502 F > Page 405

Indexable Inserts

for further details, see p. 150

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX

	03 12 835K							HSC 05	PVTi
	03 12 837K							HSC 05	PVFN
	03 12 840K							P40	PVTi
	03 12 842K							P40	PVSR
	03 12 844K							P40	PVML
	03 12 850K							P25	PVTi
	03 12 860K							K10	PVTi
	03 12 870K							cermet	PVTi

RDHX | concave moulding

	03 12 831P							K10	polished
	03 12 848K							P40	PVGO
	03 12 880							K10	PVTi
	03 12 880 D							K10	PVDiaN
	03 12 897K							P25	PVGO

major application



roughing

minor application



roughing



pre-finishing



pre-finishing



finishing



finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 6 | 12° positive axial rake angle

Tools especially suitable for milling stainless steels with chrome and nickel content:

- exceptionally easy cutting
- low energy consumption
- for unstable clamping situations

Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies

	3 35 200/12	35	12	6	42.5	2.5	-	M 16	29	3	330-335 A, B, C, D, E, F	✓
	35 500 A > Page 401	35 510 B > Page 401		15 500 C > Page 403		TV 2-8 D > Page 404		T15 500 E > Page 405		T15 502 F > Page 405		

Shell type milling cutter bodies

	4 42 310/12	42	12	6	42.5	2.5	-	diam. 16	35	4	340-341 A, B, C, D, E, F	✓
	52 310/12	52	12	6	52.5	3	-	diam. 22	40	5	342-344 A, B, C, D, E, F	✓
	35 500 A > Page 401	35 510 B > Page 401		15 500 C > Page 403		TV 2-8 D > Page 404		T15 500 E > Page 405		T15 502 F > Page 405		

Indexable Inserts

for further details, see p. 150

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

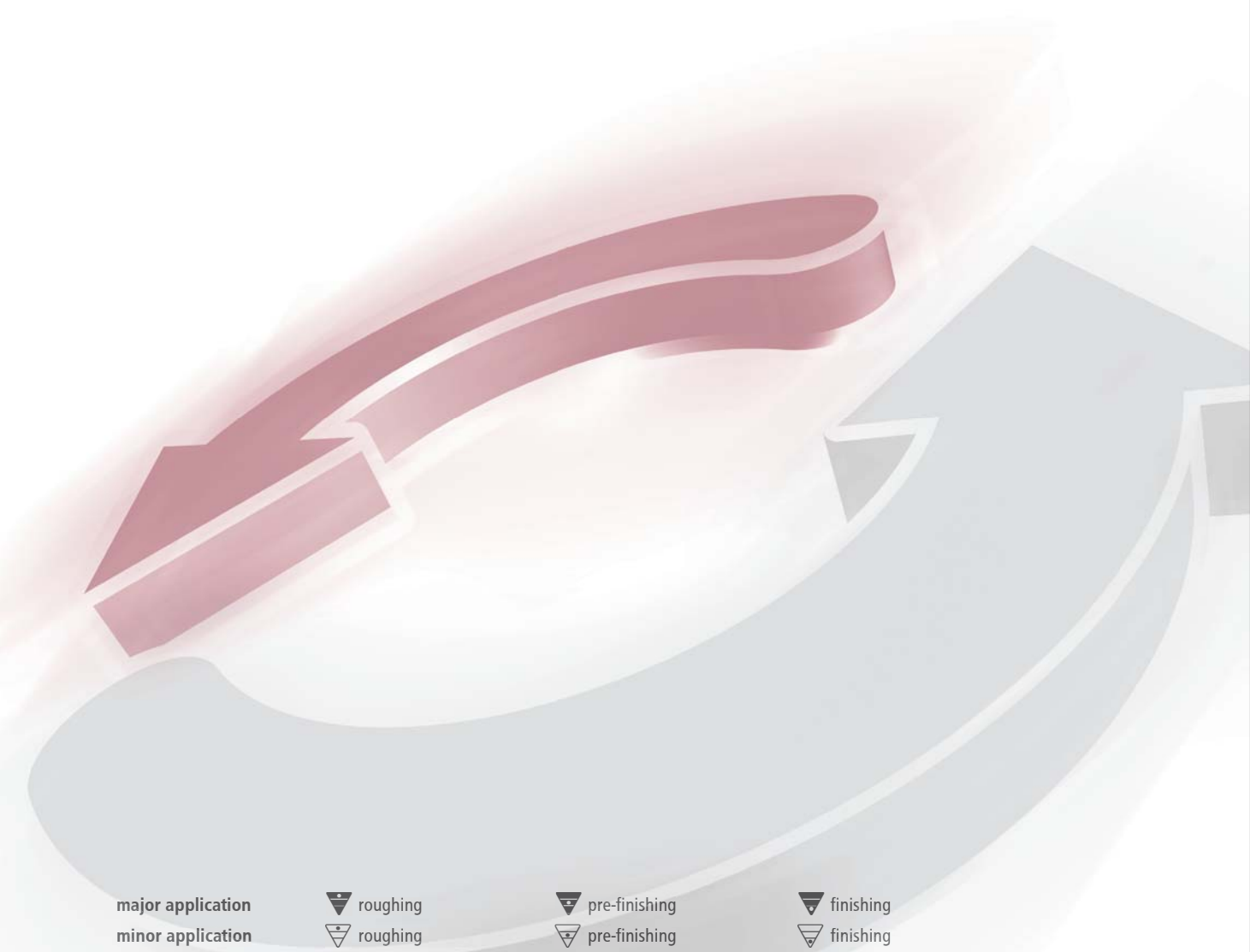
Carbide Grade

Coating

REHX

	03 12 834K							HSC 20	PVTi
	03 12 841K							P40	PVTi
	03 12 895K							P40	PVGM

pokoImCvoha
PREMIUMTOOLS. WE KNOW HOW.



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

Index



MILLING CUTTER BODIES FOR ROUND INSERTS

r 8 | 7° positive rake angle | shim

- increased reliability against fractures during machining
- optimum protection of milling cutter body by shim
- in case of insert fracture, shims, screws and threaded bushes can be replaced separately, it is not necessary to buy a new body

1/2 ▶

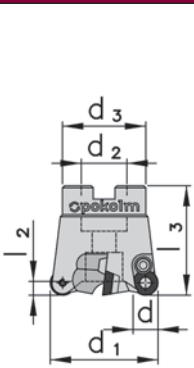
Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

Shell type milling cutter bodies

	52 300/7 HL	52	16	8	53	4.1	-	diam. 22	40	4	342-344 A - I	     	
	66 300/7 HL	66	16	8	53	4.1	-	diam. 27	48	5	345-347 A - I	     	
	80 300/7 HL	80	16	8	53	4.1	-	diam. 27	60	6	345-347 A - I	     	
	100 300/7 HL	100	16	8	53	4.1	-	diam. 32	70	7	348 A - I	    	
	 45 500 A > Page 401	 45 500 L B > Page 401			 45 500 I C > Page 403			 10 510 D > Page 403			 10 511 E > Page 403		 20 500 F > Page 403
	 TV 2-8 G > Page 404	 T20 500 H > Page 405			 T20 502 I > Page 405								

Indexable Inserts

for further details, see p. 152

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

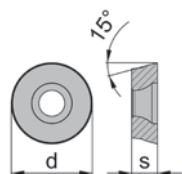
non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX



04 16 835



HSC 05

PVTi

04 16 840



P40

PVTi

04 16 842



P40

PVSR

04 16 844



P40

PVML

04 16 850



P25

PVTi

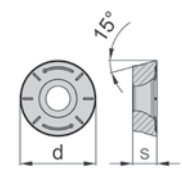
04 16 860



K10

PVTi

RDHX | concave moulding



04 16 831P



K10

polished

04 16 848



P40

PVGO

04 16 880



K10

PVTi

04 16 897



P25

PVGO

major application
minor application



roughing



roughing



pre-finishing



pre-finishing



finishing



finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 8 | neutral (0°) and 7° positive axial rake angles

The first choice when using SK 50 machines for medium and heavy milling. Tools with a 7° rake angle are characterized by its low energy consumption.

1/2 ▶

Milling cutter bodies

catalogue no.

d₁

d

r

l₃

l₂

l₁

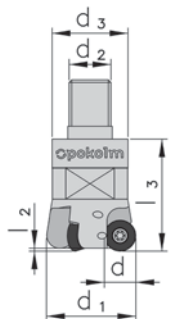
d₂

d₃

z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies



32 200

32

16

8

43.5

-

-

M 16

29

2

330-335
A, B, C, D, E



35 201

35

16

8

43.5

4

-

M 16

29

3

330-335
A, B, C, D, E



45 500
A > Page 401

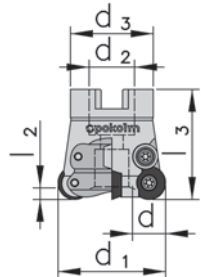
POKOLM
20 500
B > Page 403

TV 2-8
C > Page 404

T20 500
D > Page 405

T20 502
E > Page 405

Shell tp. mill. cutt. bodies | 0° axial rake angle



52 300

52

16

8

53.5

4.7

-

diam.
22

40

4

342-344
A, B, C, D, E, F



66 300

66

16

8

53.5

5.1

-

diam.
27

48

5

345-347
A, B, C, D, E, F



80 300

80

16

8

53.5

5.8

-

diam.
27

60

6

345-347
A, B, C, D, E, F



100 300

100

16

8

53.5

5.8

-

diam.
32

70

7

348
A, B, C, D, E, F



45 500
A > Page 401

10 510
B > Page 403

POKOLM
20 500
C > Page 403

TV 2-8
D > Page 404

T20 500
E > Page 405

T20 502
F > Page 405

Milling cutter bodies

catalogue no.

 d_1
 d
 r
 l_3
 l_2
 l_1
 d_2
 d_3
 z

ref. pg. arbors
ref. accessories
features

Shell tp. mill. cutt. bodies | 7° pos. rake angle

	5 52 300/7	52	16	8	53	4.1	-	diam. 22	40	5	342-344 A, C, D, E, F	
	66 300/7	66	16	8	53	4.6	-	diam. 27	48	5	345-347 A, C, D, E, F	
	6 66 300/7	66	16	8	53	5.1	-	diam. 27	48	6	345-347 A, C, D, E, F	
	80 300/7	80	16	8	53	5.1	-	diam. 27	60	6	345-347 A, B, C, D, E, F	
	100 300/7	100	16	8	53	5.1	-	diam. 32	70	7	348 A, B, C, D, E, F	
	125 300/7	125	16	8	53	5.1	-	diam. 40	90	8	349 A, B, C, D, E, F	
	160 300/7	160	16	8	53	5.1	-	diam. 40	120	9	349 A, B, C, D, E, F	
	 45 500 A > Page 401	 10 510 B > Page 403			 20 500 C > Page 403			 TV 2-8 D > Page 404			 T20 500 E > Page 405	 T20 502 F > Page 405

Indexable Inserts

for further details, see p. 152

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX

	04 16 835							HSC 05	PVTi
	04 16 840							P40	PVTi
	04 16 842							P40	PVSR
	04 16 844							P40	PVML
	04 16 850							P25	PVTi
	04 16 860							K10	PVTi

RDHX | concave moulding

	04 16 831P							K10	polished
	04 16 848							P40	PVGO
	04 16 880							K10	PVTi
	04 16 897							P25	PVGO

major application

minor application



roughing

roughing

pre-finishing

pre-finishing

finishing

finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 8 | 12° positive axial rake angle

Tools especially suitable for milling stainless steels with chrome and nickel content:

- exceptionally easy cutting
- low energy consumption
- for unstable clamping situations

Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

Shell type milling cutter bodies

	5 52 300/12	52	16	8	53	3	-	diam. 22	40	5	342-344 A, B, C, D, E, F	12°
	66 300/12	66	16	8	53	5	-	diam. 27	48	5	345-347 A, B, C, D, E, F	12°
	80 300/12	80	16	8	53	5	-	diam. 27	60	6	345-347 A, B, C, D, E, F	12°
	125 300/12	125	16	8	53	5	-	diam. 40	90	8	349 A, B, C, D, E, F	12°
	45 500 A > Page 401	10 510 B > Page 403	20 500 C > Page 403	TV 2-8 D > Page 404	T20 500 E > Page 405	T20 502 F > Page 405						

Indexable Inserts

for further details, see p. 152

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

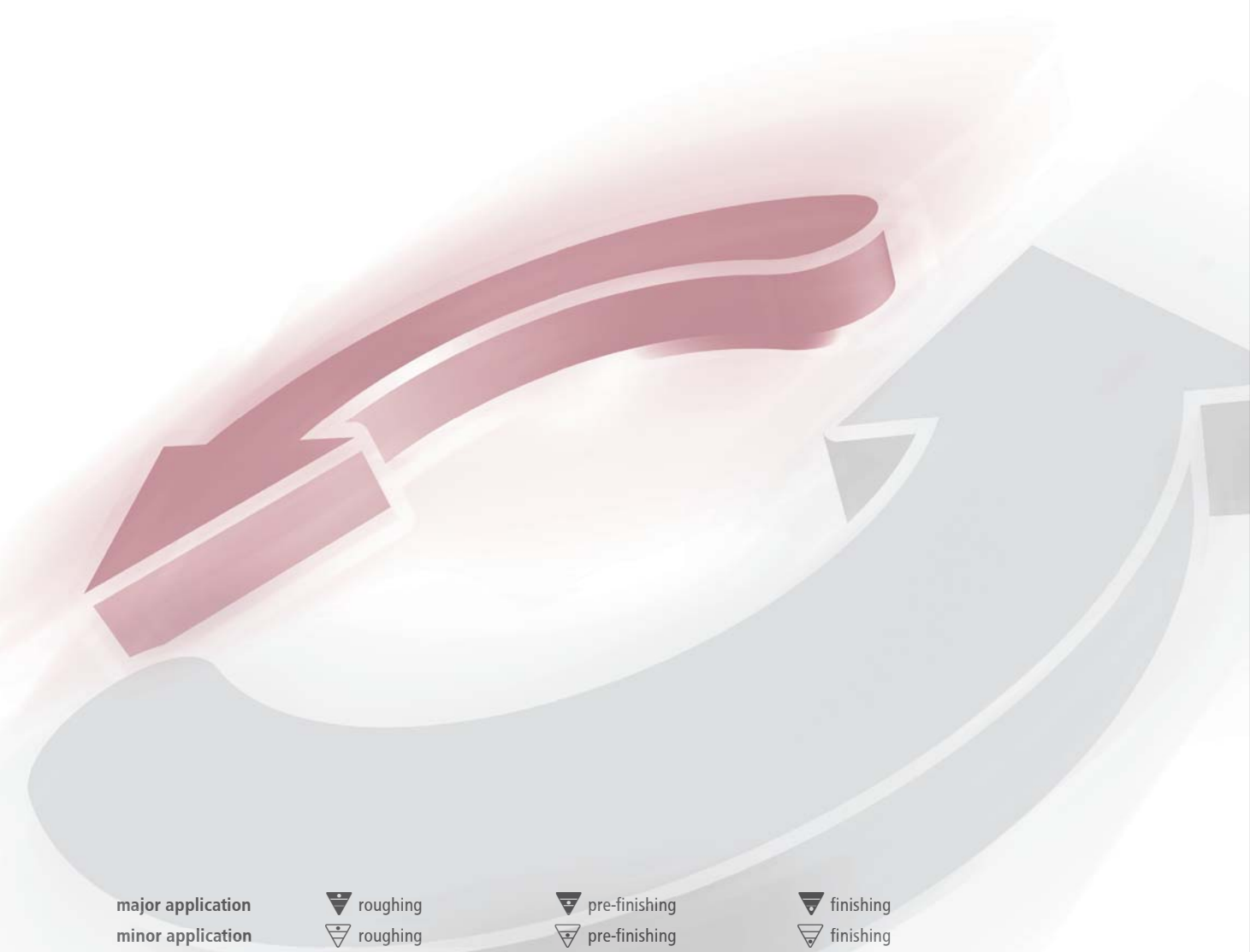
Carbide Grade

Coating

REHX

	04 16 834							HSC 20	PVTi
	04 16 841							P25	PVTi
	04 16 895							P40	PVGM

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PREMIUMTOOLS. WE KNOW HOW.



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

Index



MILLING CUTTER BODIES FOR ROUND INSERTS

r 10 | neutral (0°) and 7° positive axial rake angles

These tools have extremely rigid inserts, which provide optimal conditions for heavy-duty milling operations under most difficult conditions and allows for very high-performance milling and extremely high feed-rates.

1/2 ▶

Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies

	40 200	40	20	10	53.5	-	-	M 16	29	2	330-335 A, B, C, D, E, F	✓ H H H H
	45 500 A > Page 401	10 510 B > Page 403	20 500 C > Page 403	TV 2-8 D > Page 404	T20 500 E > Page 405	T20 502 F > Page 405						

Morse taper shank end mill bodies

	40 40 180	40	20	10	40	-	-	MTS 4	34	2	336-339 A, B, C, D, E, F	✓ H H H H
	40 50 180	50	20	10	40	6	-	MTS 4	43	3	336-339 A, B, C, D, E, F	✓ H H H H
	45 500 A > Page 401	10 510 B > Page 403	20 500 C > Page 403	TV 2-8 D > Page 404	T20 500 E > Page 405	T20 502 F > Page 405						

Shell tp. mill. cutt. bodies | 7° pos. rake angle

	5 66 340/7	66	20	10	53	6.5	-	diam. 27	48	5	345-347 A, B, C, D, E, F	✓ H H H H 7°
	80 340/7	80	20	10	53	6.5	-	diam. 27	60	5	345-347 A, B, C, D, E, F	✓ H H H H 7°
	100 340/7	100	20	10	53	6.5	-	diam. 32	70	6	348 A, B, C, D, E, F	✓ H H H H 7°
	160 340/7	160	20	10	53	6.5	-	diam. 40	120	8	349 A, B, C, D, E, F	✓ H H H H 7°
	45 500 A > Page 401	10 510 B > Page 403	20 500 C > Page 403	TV 2-8 D > Page 404	T20 500 E > Page 405	T20 502 F > Page 405						

Indexable Inserts

for further details, see p. 154

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

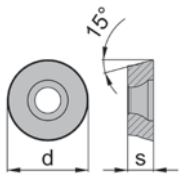
non-ferrous
materials

hardened steel

Carbide Grade

Coating

RDHX



06 20 835



HSC 05

PVTi

06 20 840



P40

PVTi

06 20 844



P40

PVML

06 20 850



P25

PVTi

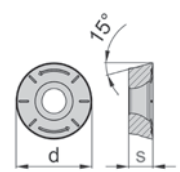
06 20 860



K10

PVTi

RDHX | concave moulding



06 20 831P



K10

polished

06 20 880



K10

PVTi

06 20 880 D



K10

PVDiaN

major application
minor application


roughing



roughing



pre-finishing



pre-finishing



finishing



finishing



MILLING CUTTER BODIES FOR ROUND INSERTS

r 10 | 17° positive axial rake angle

These face mills have extremely rigid inserts specially designed for very high-performance milling and an extremely high feed per tooth. The exceptionally easy cutting geometry makes it especially suitable for steel and stainless steel.

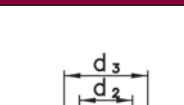
Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

Shell type milling cutter bodies

	80 340/17	80	20	10	53	6	-	diam. 27	60	5	345-347 A, B, C, D, E, F	
	100 340/17	100	20	10	53	6	-	diam. 32	70	6	348 A, B, C, D, E, F	
	160 340/17	160	20	10	53	6	-	diam. 40	120	8	349 A, B, C, D, E, F	
	 45 500 A > Page 401	 10 510 B > Page 403	 20 500 C > Page 403	 TV 2-8 D > Page 404	 T20 500 E > Page 405	 T20 502 F > Page 405						

Indexable Inserts

for further details, see p. 154

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

RFHX

	06 20 843							P40	PVML

BALL NOSE END MILL BODIES

WaveWorx® | r 8

This new generation of ball nose end mills was developed especially for roughing of steel:

- for roughing, removing residual material and pre-finishing of steel
- for deep cavities and low spindle revolutions
- two effective cutting edges double its efficiency



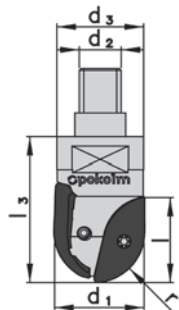
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank End Mill Bodies



16 275

16

15.6

8

24.7

-

-

M 8

13.8

2

314-318

A, B, C, D, E

✓

✗

✗

✗

✗

✗

✗

✗

25 505
A > Page 401

POKOLM
08 500
B > Page 403

TV 08-2
C > Page 404

T8 500
D > Page 405

T8 502
E > Page 405

Indexable Inserts

for further details, see p. 156

catalogue no.

steel

high-temperature

alloys

stainless steel

cast iron

non-ferrous

materials

hardened steel

Carbide Grade

Coating

r 8

03 16 850



P25

PVML

major application
minor application



roughing



roughing



pre-finishing



pre-finishing



finishing



finishing



BALL NOSE END MILL BODIES

WaveWorx® | r 10

This new generation of ball nose end mills was developed especially for roughing steel:

- for roughing, removing residual material and pre-finishing of steel
- for deep cavities and low spindle revolutions
- two effective cutting edges double its efficiency

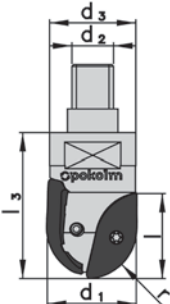
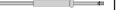
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank End Mill Bodies

	20 275	20	19.6	10	28.8	-	-	M 10	18	2	319-323 A, B, C, D, E	
 30 505 A > Page 401	 09 500 B > Page 403	 TV 1-5 C > Page 404	 T9 500 D > Page 405	 T9 502 E > Page 405								

Indexable Inserts

for further details, see p. 156

catalogue no.

steel high-temperature alloys stainless steel cast iron non-ferrous materials hardened steel Carbide Grade Coating

r 10

	04 20 850								P25	PVML

BALL NOSE END MILL BODIES

WaveWorx® | r 12.5

This new generation of ball nose end mills was developed especially for roughing steel:

- for roughing, removing residual material and pre-finishing of steel
- for deep cavities and low spindle revolutions
- two effective cutting edges double its efficiency



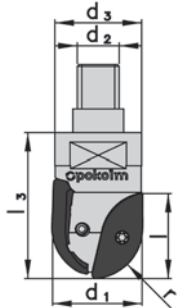
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

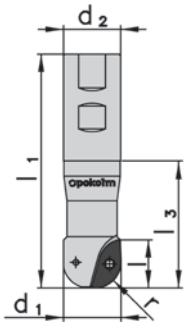
ref. pg. arbors
ref. accessories
features

Threaded shank End Mill Bodies



25 275	25	24.5	12.5	36.5	-	-	M 12	21	2	324-329 A, B, C, D, E	
40 505 K A > Page 401	15 500 B > Page 403	TV 2-8 C > Page 404	T15 500 D > Page 405	T15 502 E > Page 405							

Plain shank end mill bodies



60 25 175	25	24.5	12.5	60.4	-	116.2	diam. 25	-	2	382-383 A, B, C, D, E	
40 505 K A > Page 401	15 500 B > Page 403	TV 2-8 C > Page 404	T15 500 D > Page 405	T15 502 E > Page 405							

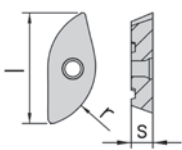
Indexable Inserts

for further details, see p. 156

catalogue no.

steel high-temperature alloys stainless steel cast iron non-ferrous materials hardened steel Carbide Grade Coating

r 12.5



05 25 850								P25	PVML

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing



BALL NOSE END MILL BODIES

WaveWorx® | r 16

This new generation of ball nose end mills was developed especially for roughing steel:

- for roughing, removing residual material and pre-finishing of steel
- for deep cavities and low spindle revolutions
- two effective cutting edges double its efficiency

Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies

	32 275	32	30.7	16	49.2	-	-	M 16	29	2	330-335 A, B, C, D, E	
	 40 505 A > Page 401	 15 500 B > Page 403	 TV 2-8 C > Page 404	 T15 500 D > Page 405	 T15 502 E > Page 405							

Plain shank end mill bodies

	70 32 175	32	30.7	16	70	-	130	diam. 32	-	2	A, B, C, D, E	
	 40 505 A > Page 401	 15 500 B > Page 403	 TV 2-8 C > Page 404	 T15 500 D > Page 405	 T15 502 E > Page 405							

Indexable Inserts

for further details, see p. 156

catalogue no.

steel high-temperature alloys stainless steel cast iron non-ferrous materials hardened steel Carbide Grade Coating

r 16

	06 32 850								P25	PVML

BALL NOSE END MILL BODIES

for inserts with 4 cutting edges | r 5

The special insert geometry of these tools makes it ideally suited for finishing and pre-finishing operations on modern high-speed milling machines with 5 axes. The advantage of the insert with 4 cutting edges is: it is reversible, thus it doubles its productivity.

Optimum cutting conditions can only be achieved with an approach angle of spindle.



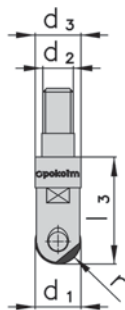
Milling cutter bodies

catalogue no.

d_1 d r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank End Mill Bodies



10 210

10

10

5

28.5

-

-

M 5

9.7

2

312-313

A, B, C, D, E

✓

⊗

⊗

35 520
A > Page 401

POKOLM
10 500
B > Page 403

TV 1-5
C > Page 404

T10 500
D > Page 405

T10 502
E > Page 405

Indexable Inserts

for further details, see p. 158

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

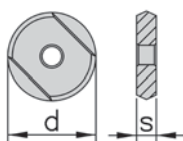
r 5

10 10 860



K05

PVTi



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing



BALL NOSE END MILL BODIES

for inserts with 4 cutting edges | r 6

The special insert geometry of these tools makes it ideally suited for finishing and pre-finishing operations on modern high-speed milling machines with 5 axes.

The advantage of the insert with 4 cutting edges is: it is reversible, thus it doubles its productivity.

Optimum cutting conditions can only be achieved with an approach angle of spindle.

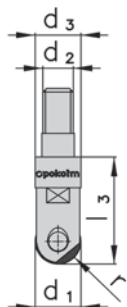
Milling cutter bodies

catalogue no.

d_1 d r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank End Mill Bodies



12 210	12	12	6	28.7	-	-	M 8	11.8	2	314-318 A, B, C, D, E	  
 40 520 A > Page 401	 15 500 B > Page 403	 TV 2-8 C > Page 404	 T15 500 D > Page 405	 T15 502 E > Page 405							

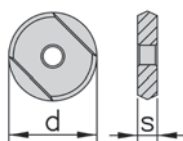
Indexable Inserts

for further details, see p. 158

catalogue no.

steel high-temperature alloys stainless steel cast iron non-ferrous materials hardened steel Carbide Grade Coating

r 6



10 12 860							K05	PVTi

BALL NOSE END MILL BODIES

for inserts with 4 cutting edges | r 8

The special insert geometry of these tools makes it ideally suited for finishing and pre-finishing operations on modern high-speed milling machines with 5 axes. The advantage of the insert with 4 cutting edges is: it is reversible, thus it doubles its productivity.

Optimum cutting conditions can only be achieved with an approach angle of spindle.



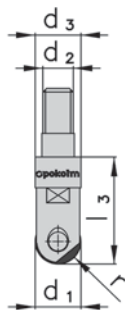
Milling cutter bodies

catalogue no.

d_1 d r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank End Mill Bodies



16 210	16	16	8	36.4	-	-	M 8	13.8	2	314-318 A, B, C, D, E	
 50 520 A > Page 401	 20 500 B > Page 403	 TV 2-8 C > Page 404	 T20 500 D > Page 405	 T20 502 E > Page 405							

Indexable Inserts

for further details, see p. 158

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

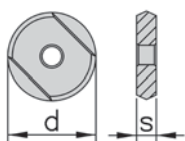
non-ferrous
materials

hardened steel

Carbide Grade

Coating

r 8



10 16 860							K05	PVTi

major application
minor application

roughing
 pre-finishing

pre-finishing
 finishing

finishing
 pre-finishing



BALL NOSE END MILL BODIES

for inserts with 4 cutting edges | r 10

The special insert geometry of these tools makes it ideally suited for finishing and pre-finishing operations on modern high-speed milling machines with 5 axes.

The advantage of the insert with 4 cutting edges is: it is reversible, thus it doubles its productivity.

Optimum cutting conditions can only be achieved with an approach angle of spindle.

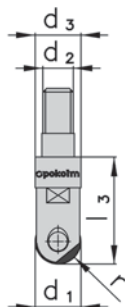
Milling cutter bodies

catalogue no.

d_1 d r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank End Mill Bodies



20 210	20	20	10	36.9	-	-	M 10	18	2	319-323 A, B, C, D, E	  
 50 520 A > Page 401	 20 500 B > Page 403	 TV 2-8 C > Page 404	 T20 500 D > Page 405	 T20 502 E > Page 405							

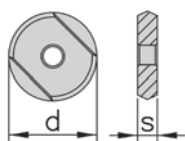
Indexable Inserts

for further details, see p. 158

catalogue no.

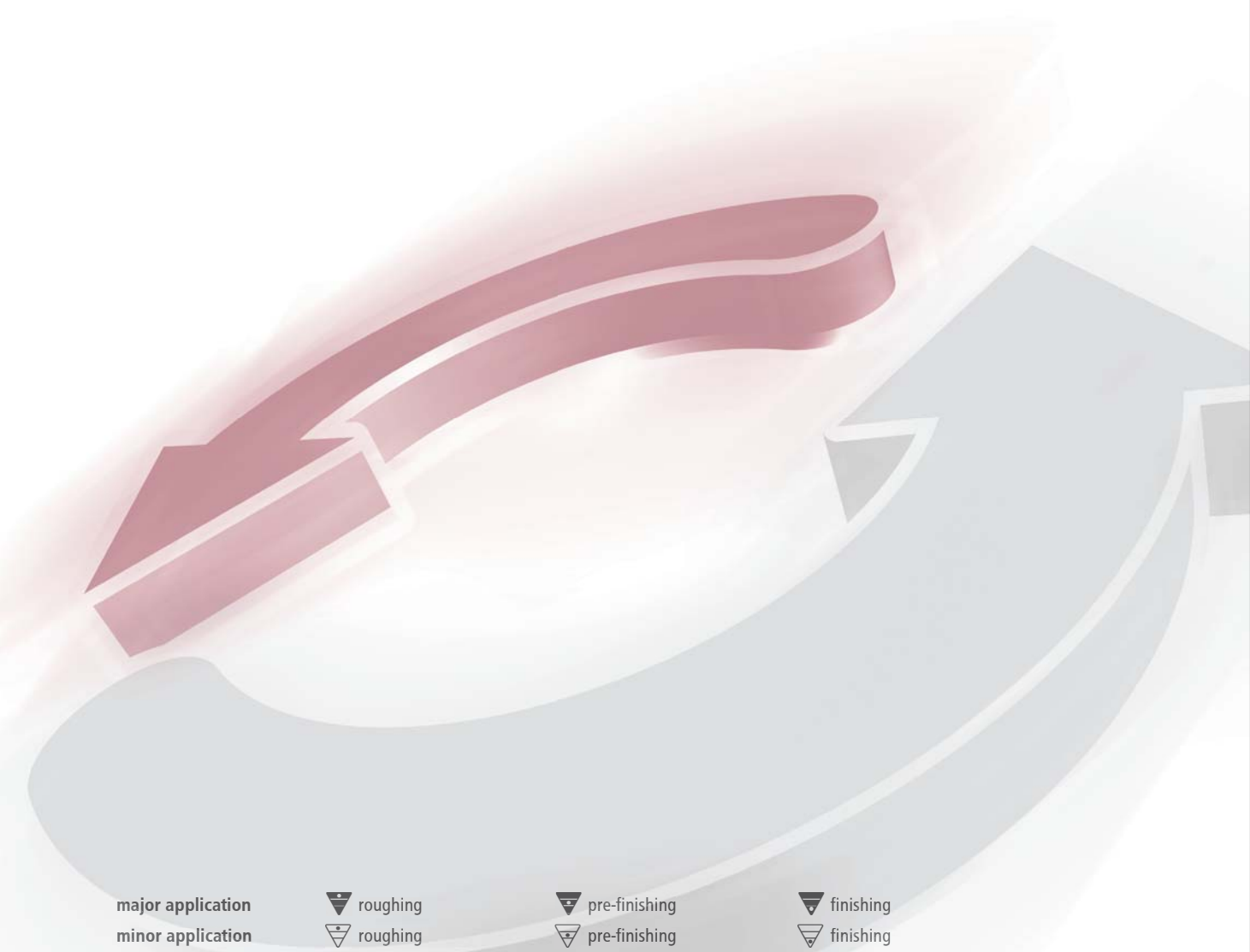
steel high-temperature alloys stainless steel cast iron non-ferrous materials hardened steel Carbide Grade Coating

r 10



10 20 860							K05	PVTi

pokoImCvoha
PREMIUMTOOLS. WE KNOW HOW.



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

Index



UNIWORX® BALL- AND BULL END COMBI END MILLS

r 3 | r 4

Our ball nose and bull end combi end mills provide maximum precision because of both the V-shaped insert seat and because the insert was ground in only one setup. The helix-shaped rake angle allows very easy cutting and extremely smooth operation.

Only for finishing and pre-finishing operations.

1/2 ▶

Milling cutter bodies

catalogue no.

d_1 d r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies

	08 214	8	8	3 4	26	-	18.9	M 5	9.6	2	312-313 A, B, C, D, E	
	 30 522 A > Page 401	 08 500 B > Page 403	 TV 1-5 C > Page 404	 T10 500 D > Page 405	 T10 502 E > Page 405							

Plain shank ball nose end mill bodies

	30 08 114	8	8	3 4	30	-	20	diam. 12	-	2	385 A, B, C, D, E	
	50 08 114	8	8	3 4	50	-	20	diam. 12	-	2	385 A, B, C, D, E	
	 30 522 A > Page 401	 08 500 B > Page 403	 TV 1-5 C > Page 404	 T10 500 D > Page 405	 T10 502 E > Page 405							

Indexable Inserts

for further details, see p. 160

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

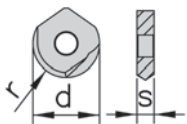
non-ferrous
materials

hardened steel

Carbide Grade

Coating

r 4



08 835 V



HSC 05

PVTi

08 836 V



HSC 05

PVTiH

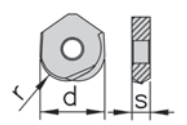
08 840 V



P40

PVTi

r 3



08 093 V R3



CBN for cast
iron

08 835 V R3



HSC 05

PVTi

08 836 V R3



HSC 05

PVTiH

major application
minor application

roughing
 pre-finishing

roughing
 pre-finishing

roughing
 pre-finishing



UNIWORX® BALL- AND BULL END COMBI END MILLS

r 4 | r 5

Our ball nose and bull end combi end mills provide maximum precision because of both the V-shaped insert seat and because the insert was ground in only one setup. The helix-shaped rake angle allows very easy cutting and extremely smooth operation.

Only for finishing and pre-finishing operations.

1/2 ▶

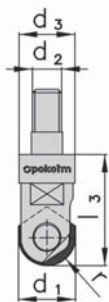
Milling cutter bodies

catalogue no.

d₁ d r l₃ l₂ l₁ d₂ d₃ z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies



10 214

10

10

4 | 5

24.5

-

-

M 5

9.6

2

312-313

A, B, C, D, E

✓

⊗

⚙

35 520
A > Page 401

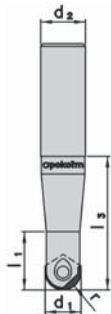
POKOLM
10 500
B > Page 403

TV 1-5
C > Page 404

T10 500
D > Page 405

T10 502
E > Page 405

Plain shank ball nose end mill bodies



30 10 114

10

10

4 | 5

30

-

20

diam. 12

-

2

385

A, B, C, D, E

⚠

⊗

⚙

35 520
A > Page 401

POKOLM
10 500
B > Page 403

TV 1-5
C > Page 404

T10 500
D > Page 405

T10 502
E > Page 405

Indexable Inserts

for further details, see p. 160

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

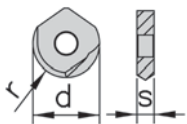
non-ferrous
materials

hardened steel

Carbide Grade

Coating

r 5



10 835 V



HSC 05

PVTi

10 836 V



HSC 05

PVTiH

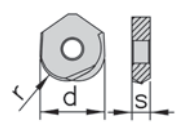
10 840 V



P40

PVTi

r 4



10 093 V R4


CBN for cast
iron

10 835 V R4



HSC 05

PVTi

10 836 V R4



HSC 05

PVTiH

major application
minor application


roughing

roughing



pre-finishing

pre-finishing



finishing

finishing



UNIWORX® BALL- AND BULL END COMBI END MILLS

r 5 | r 6

Our ball nose and bull end combi end mills provide maximum precision because of both the V-shaped insert seat and because the insert was ground in only one setup. The helix-shaped rake angle allows very easy cutting and extremely smooth operation.

Only for finishing and pre-finishing operations.

1/2 ▶

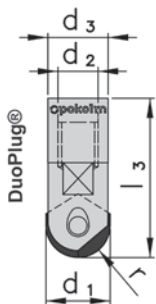
Milling cutter bodies

catalogue no.

d_1 d r l_3 l_2 l_1 d_2 d_3 z

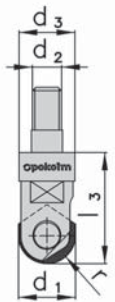
ref. pg. arbors
ref. accessories
features

DuoPlug®



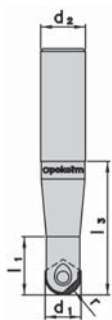
12 214 SG	12	12	5 6	33.5	-	-	M 7	10.8	2	310-311 A, B, C, D, E	☒ ☒ ☒ ☒
 40 520 A > Page 401	 15 500 B > Page 403	 TV 2-8 C > Page 404	 T15 500 D > Page 405	 T15 502 E > Page 405							

Threaded shank end mill bodies



12 214	12	12	5 6	28.5	-	-	M 8	11.8	2	314-318 A, B, C, D, E	☒ ☒ ☒ ☒
 40 520 A > Page 401	 15 500 B > Page 403	 TV 2-8 C > Page 404	 T15 500 D > Page 405	 T15 502 E > Page 405							

Plain shank ball nose end mill bodies



50 12 114	12	12	5 6	50	-	50	diam. 12	-	2	385 A, B, C, D, E	☒ ☒ ☒ ☒
 40 520 A > Page 401	 15 500 B > Page 403	 TV 2-8 C > Page 404	 T15 500 D > Page 405	 T15 502 E > Page 405							

Indexable Inserts

for further details, see p. 160

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

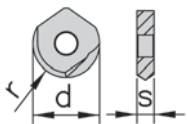
non-ferrous
materials

hardened steel

Carbide Grade

Coating

r 6



12 835 V



HSC 05

PVTi

12 836 V



HSC 05

PVTiH

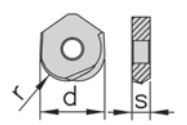
12 840 V



P40

PVTi

r 5



12 093 V R5


CBN for cast
iron

12 835 V R5



HSC 05

PVTi

12 836 V R5



HSC 05

PVTiH

major application
minor application


roughing

roughing



pre-finishing

pre-finishing



finishing

finishing



UNIWORX® BALL- AND BULL END COMBI END MILLS

r 7 | r 8

Our ball nose and bull end combi end mills provide maximum precision because of both the V-shaped insert seat and because the insert was ground in only one setup. The helix-shaped rake angle allows very easy cutting and extremely smooth operation.

Only for finishing and pre-finishing operations.

1/2 ▶

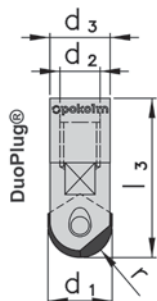
Milling cutter bodies

catalogue no.

d_1 d r l_3 l_2 l_1 d_2 d_3 z

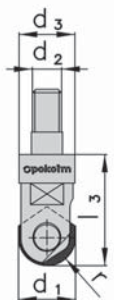
ref. pg. arbors
ref. accessories
features

DuoPlug®



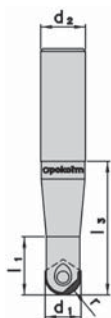
16 214 SG	16	16	7 8	40	-	-	M 10	15	2	310-311 A, B, C, D, E	☒    
 50 520 A > Page 401	 20 500 B > Page 403	 TV 2-8 C > Page 404	 T20 500 D > Page 405	 T20 502 E > Page 405							

Threaded shank end mill bodies



16 214	16	16	7 8	36.5	-	-	M 8	13.8	2	314-318 A, B, C, D, E	☒  
 50 520 A > Page 401	 20 500 B > Page 403			 TV 2-8 C > Page 404			 T20 500 D > Page 405		 T20 502 E > Page 405		

Plain shank ball nose end mill bodies



30 16 114	16	16	7 8	30	-	30	diam. 16	-	2	375-378 A, B, C, D, E	  
60 16 114	16	16	7 8	60	-	26	diam. 20	-	2	379-381 A, B, C, D, E	  
 50 520 A > Page 401	 20 500 B > Page 403			 TV 2-8 C > Page 404			 T20 500 D > Page 405			 T20 502 E > Page 405	

Indexable Inserts

for further details, see p. 160

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

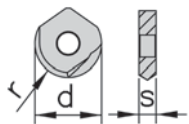
non-ferrous
materials

hardened steel

Carbide Grade

Coating

r 8



16 835 V



HSC 05

PVTi

16 836 V



HSC 05

PVTiH

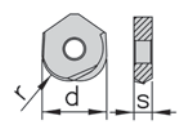
16 840 V



P40

PVTi

r 7



16 093 V R7


CBN for cast
iron

16 835 V R7



HSC 05

PVTi

16 836 V R7



HSC 05

PVTiH

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing



UNIWORX® BALL- AND BULL END COMBI END MILLS

r 10

Our ball nose and bull end combi end mills provide maximum precision because of both the V-shaped insert seat and because the insert was ground in only one setup. The helix-shaped rake angle allows very easy cutting and extremely smooth operation.

Only for finishing and pre-finishing operations.

1/2 ▶

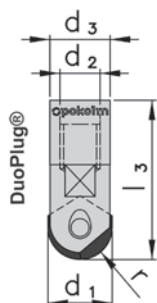
Milling cutter bodies

catalogue no.

d_1 d r l_3 l_2 l_1 d_2 d_3 z

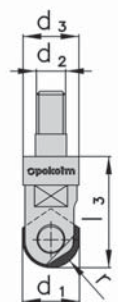
ref. pg. arbors
ref. accessories
features

DuoPlug®



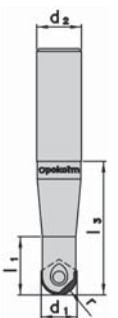
20 214 SG	20	20	9 10	42.5	-	-	M 12	18.5	2	310-311 A, B, C, D, E	   
 50 520 A > Page 401	 20 500 B > Page 403	 TV 2-8 C > Page 404	 T20 500 D > Page 405	 T20 502 E > Page 405							

Threaded shank end mill bodies



20 214	20	20	9 10	37	-	-	M 10	18	2	319-323 A, B, C, D, E	☒  
 50 520 A > Page 401	 20 500 B > Page 403	 TV 2-8 C > Page 404	 T20 500 D > Page 405	 T20 502 E > Page 405							

Plain shank ball nose end mill bodies



40 20 114	20	20	9 10	40	-	40	diam. 20	-	2	379-381 A, B, C, D, E	  
80 20 114	20	20	9 10	80	-	80	diam. 20	-	2	379-381 A, B, C, D, E	  
 50 520 A > Page 401	 20 500 B > Page 403	 TV 2-8 C > Page 404	 T20 500 D > Page 405	 T20 502 E > Page 405							

Indexable Inserts

for further details, see p. 160

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

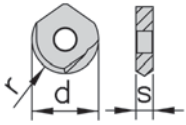
non-ferrous
materials

hardened steel

Carbide Grade

Coating

r 10



20 835 V



HSC 05

PVTi

20 836 V



HSC 05

PVTiH

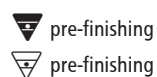
20 840 V



P40

PVTi

major application
minor application





SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

Slotworx® | size S

Outstandingly capable for using on high-speed milling machines and smaller machining centres.

- the increased no. of teeth allows for very large feed-rates

1/2 ▶

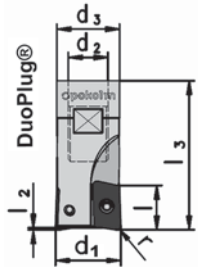
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

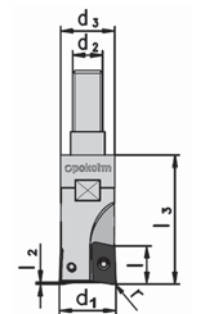
ref. pg. arbors
ref. accessories
features

DuoPlug®



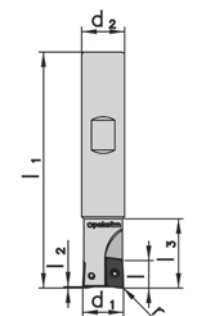
4 16 256 SG	16	6.9	0,8	34.4	1.3	-	M 10	15	4	310-311 A, B, C, D, E	✓ H I Q
5 20 256 SG	20	6.9	0,8	32.4	1.3	-	M 12	18.5	5	310-311 A, B, C, D, E	✓ H I Q
18 500 A > Page 401	06 500 B > Page 403	TV 04-1 C > Page 404	T6 500 D > Page 405	T6 502 E > Page 405							

Threaded shank end mill bodies



2 10 256	10	6.9	0,8	22.5	0.7	-	M 5	9.5	2	312-313 A, B, C, D, E	✓ H I Q
3 12 256	12	6.9	0,8	27.5	0.7	-	M 8	11.8	3	314-318 A, B, C, D, E	✓ H I Q
4 16 256	16	6.9	0,8	27.5	1.3	-	M 8	13.8	4	314-318 A, B, C, D, E	✓ H I Q
5 20 256	20	6.9	0,8	27.5	1.3	-	M 10	18	5	319-323 A, B, C, D, E	✓ H I Q
18 500 A > Page 401	06 500 B > Page 403	TV 04-1 C > Page 404	T6 500 D > Page 405	T6 502 E > Page 405							

Plain shank end mill bodies



15 10 156	10	6.9	0,8	16.7	0.7	55.6	diam. 10	-	2	366-370 A, B, C, D, E	✓ H I Q
15 12 156	12	6.9	0,8	17.5	0.7	60.5	diam. 12	-	3	385 A, B, C, D, E	✓ H I Q
40 16 156	16	6.9	0,8	42.5	1.3	90.5	diam. 16	-	4	375-378 A, B, C, D, E	✓ H I Q
18 500 A > Page 401	06 500 B > Page 403	TV 04-1 C > Page 404	T6 500 D > Page 405	T6 502 E > Page 405							

Indexable Inserts
for further details, see p. 166

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

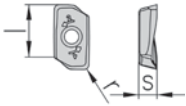
non-ferrous
materials

hardened steel

Carbide Grade

Coating

Size S | r 0.8



02 71 840 R08



P40

PVML

major application
minor application



roughing
roughing



pre-finishing
pre-finishing



finishing
finishing



SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

Slotworx® | size M

This new range is the all-purpose solution for square shoulder face milling and slotting.

Applicable for inserts of line Slotworx®-M up to a corner radius of 2 mm.

1/2 ▶

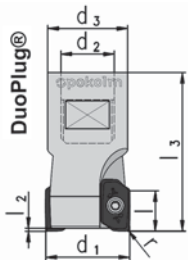
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

DuoPlug®



2 16 267 SG

16

10

1-2

38

2.5

-

M 10

15

2

310-311

A, B

✓

NEW

NEW

NEW

NEW

2 20 267 SG

20

10

1-2

40

2.5

-

M 12

18.6

2

310-311

A, B

✓

NEW

NEW

NEW

NEW

3 25 267 SG

25

10

1-2

43

2.5

-

M 16

21.5

3

310-311

A, B

✓

NEW

NEW

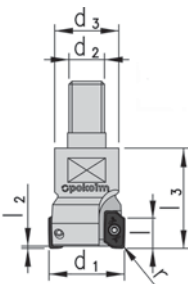
NEW

NEW

25 505 KP
A > Page 401

POKOLM
08 500 P
B > Page 403

Threaded shank end mill bodies



2 16 267

16

10

1-2

29

2.5

-

M 8

13.8

2

314-318

A, C

✓

NEW

NEW

NEW

NEW

2 20 267

20

10

1-2

29

2.5

-

M 10

18

2

319-323

A, C

✓

NEW

NEW

NEW

NEW

3 25 267

25

10

1-2

33

2.5

-

M 12

21

3

324-329

A, C

✓

NEW

NEW

NEW

NEW

4 32 267

32

10

1-2

43

2.5

-

M 16

29

4

330-335

B, C

✓

NEW

NEW

NEW

NEW

5 42 267

42

10

1-2

43

2.5

-

M 16

29

5

330-335

B, C

✓

NEW

NEW

NEW

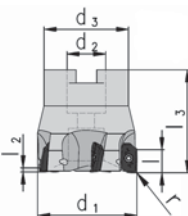
NEW

25 505 KP
A > Page 401

25 505 P
B > Page 401

POKOLM
08 500 P
C > Page 403

Shell type milling cutter bodies



5 42 367

42

10

1-2

43

2.5

-

diam. 16

35

5

340-341

A, B

✓

NEW

NEW

NEW

NEW

6 52 367

52

10

1-2

53

2.5

-

diam. 22

40

6

342-344

A, B

✓

NEW

NEW

NEW

NEW

25 505 P
A > Page 401

POKOLM
08 500 P
B > Page 403

Indexable Inserts

for further details, see p. 168

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

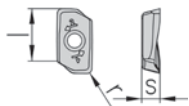
non-ferrous
materials

hardened steel

Carbide Grade

Coating

Size M | r 1



04 67 820



K10

polished

04 67 837



HSC 05

PVFN

04 67 844



P40

PVGO

04 67 848



P40

PVGO

04 67 860



K10

PVTi

04 67 860 D



K10

PVDiaN

04 67 896

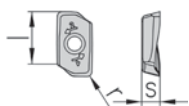


M40

PVST

size M | r 2

NEW



04 67 820 R20

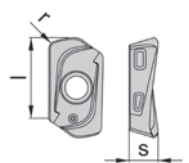


K10

polished

size M | HF

NEW



04 67 848 HF



P40

PVGO

04 67 862 HF



K10

PVGP

major application
minor application


roughing

roughing



pre-finishing

pre-finishing



finishing

finishing



SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

Slotworx® | size M | R+

Modified milling cutter bodies for using our new inserts with corner radii ≥ 3 mm.

1/2 ▶

Milling cutter bodies

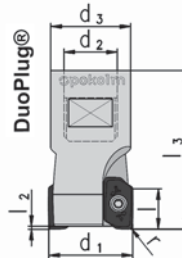
catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

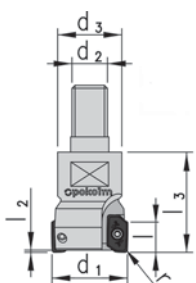
DuoPlug

NEW

 DuoPlug®	2 16 267 SG R+	16	10	3 4	38	2.5	-	M 10	15	2	310-311 A, B				
	2 20 267 SG R+	20	10	3 4	40	2.5	-	M 12	18.6	2	310-311 A, B				
	3 25 267 SG R+	25	10	3 4	43	2.5	-	M 16	21.5	3	310-311 A, B				
	 25 505 KP A > Page 401	 08 500 P B > Page 403													

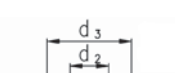
End mill bodies with thread connections

NEW

	2 16 267 R+	16	10	3 4	29	2.5	-	M 8	13.8	2	314-318 A, C			
	2 20 267 R+	20	10	3 4	29	2.5	-	M 10	18	2	319-323 A, C			
	3 25 267 R+	25	10	3 4	33	2.5	-	M 12	21	3	324-329 A, C			
	4 32 267 R+	32	10	3 4	43	2.5	-	M 16	29	4	330-335 B, C			
	5 42 267 R+	42	10	3 4	43	2.5	-	M 16	29	5	330-335 B, C			
 25 505 KP A > Page 401	 25 505 P B > Page 401			 08 500 P C > Page 403										

Shell type milling cutter bodies

NEW

	5 42 367 R+	42	10	3 4	43	2.5	-	diam. 16	35	5	340-341 A, B				
	6 52 367 R+	52	10	3 4	53	2.5	-	diam. 22	40	6	342-344 A, B				
 25 505 P A > Page 401	 08 500 P B > Page 403														

Indexable Inserts

for further details, see p. 168

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

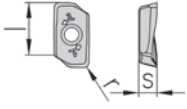
hardened steel

Carbide Grade

Coating

size M | r 3

NEW



04 67 820 R30

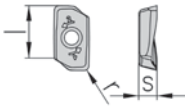


K10

polished

size M | r 4

NEW



04 67 820 R40



K10

polished

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing



SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

Slotworx® | size L

Universally applicable for maximum cutting depths. These tools stand out for low energy consumption and maximum rigidity. Usable with inserts of the Slotworx®-L-range with corner radius up to 3 mm.

1/2 ▶

Milling cutter bodies

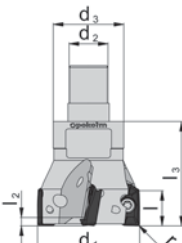
catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

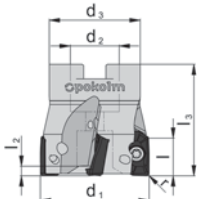
Threaded shank end mill bodies

NEW

	2 25 268	25	15	1 3	35	3	-	M 12	21	2	324-329 A, B, C, D, E	   
	3 32 268	32	15	1 3	43	3	-	M 16	29	3	330-335 A, B, C, D, E	   
	4 40 268	40	15	1 3	43	3	-	M 16	29	4	330-335 A, B, C, D, E	   
	4 42 268	42	15	1 3	43	3	-	M 16	29	4	330-335 A, B, C, D, E	   
	 35 500 A > Page 401	 15 500 B > Page 403	 TV 2-8 C > Page 404	 T15 500 D > Page 405	 T15 502 E > Page 405							

Shell type milling cutter bodies

NEW

	4 40 368	40	15	1 3	43	3	-	diam. 16	35	4	340-341 A, B, C, D, E	   	
	4 42 368	42	15	1 3	43	3	-	diam. 16	35	4	340-341 A, B, C, D, E	   	
	5 50 368	50	15	1 3	53	3	-	diam. 22	40	5	342-344 A, B, C, D, E	   	
	5 52 368	52	15	1 3	53	3	-	diam. 22	40	5	342-344 A, B, C, D, E	   	
	6 63 368	63	15	1 3	53	3	-	diam. 27	48	6	345-347 A, B, C, D, E	   	
	6 66 368	66	15	1 3	53	3	-	diam. 27	48	6	345-347 A, B, C, D, E	   	
	7 80 368	80	15	1 3	53	3	-	diam. 27	60	7	345-347 A, B, C, D, E	   	
	9 100 368	100	15	1 3	53	3	-	diam. 32	70	9	348 A, B, C, D, E	  	
 35 500 A > Page 401	 15 500 B > Page 403			 TV 2-8 C > Page 404			 T15 500 D > Page 405			 T15 502 E > Page 405			

Indexable Inserts

for further details, see p. 172

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

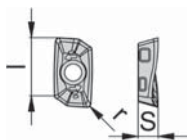
hardened steel

Carbide Grade

Coating

size L | r 1

NEW



05 68 848



P40

PVGO

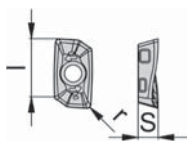
05 68 896

M40

PVST

size L | r 3

NEW



05 68 820 R30



K10

polished

major application
minor application

 roughing
 roughing

 pre-finishing
 pre-finishing

 finishing
 finishing



SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

Slotworx® | size L | R+

Modified milling cutter bodies for using our new inserts with corner radii ≥ 4 mm.

1/2 ▶

Milling cutter bodies

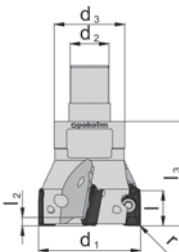
catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

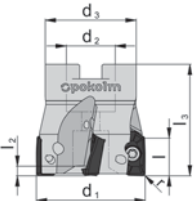
End mill bodies with thread connections

NEW

	2 25 268 R+	25	15	4 5	35	3	-	M 12	21	2	324-329 A, B, C, D, E	  
	3 32 268 R+	32	15	4 5	43	3	-	M 16	29	3	330-335 A, B, C, D, E	  
	4 40 268 R+	40	15	4 5	43	3	-	M 16	29	4	330-335 A, B, C, D, E	  
	4 42 268 R+	42	15	4 5	43	3	-	M 16	29	4	330-335 A, B, C, D, E	  
	 35 500 A > Page 401	 15 500 B > Page 403		 TV 2-8 C > Page 404		 T15 500 D > Page 405		 T15 502 E > Page 405				

Shell type milling cutter bodies

NEW

	4 40 368 R+	40	15	4 5	43	3	-	diam. 16	35	4	340-341 A, B, C, D, E	   	
	4 42 368 R+	42	15	4 5	43	3	-	diam. 16	35	4	340-341 A, B, C, D, E	   	
	5 50 368 R+	50	15	4 5	53	3	-	diam. 22	40	5	342-344 A, B, C, D, E	   	
	5 52 368 R+	52	15	4 5	53	3	-	diam. 22	40	5	342-344 A, B, C, D, E	   	
	6 63 368 R+	63	15	4 5	53	3	-	diam. 27	48	6	345-347 A, B, C, D, E	   	
	6 66 368 R+	66	15	4 5	53	3	-	diam. 27	48	6	345-347 A, B, C, D, E	   	
	7 80 368 R+	80	15	4 5	53	3	-	diam. 27	60	7	345-347 A, B, C, D, E	   	
	9 100 368 R+	100	15	4 5	53	3	-	diam. 32	70	9	348 A, B, C, D, E	   	
 35 500 A > Page 401	 15 500 B > Page 403			 TV 2-8 C > Page 404			 T15 500 D > Page 405			 T15 502 E > Page 405			

Indexable Inserts

for further details, see p. 172

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

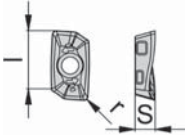
hardened steel

Carbide Grade

Coating

size L | r 4

NEW



05 68 820 R40

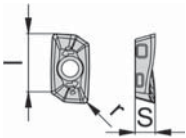


K10

polished

size L | r 5

NEW



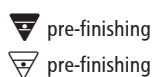
05 68 820 R50



K10

polished

major application
minor application





SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

for ADEW inserts | $r=0.8$

These universal milling cutters for machine building and toolmaking are characterized for their low energy consumption.

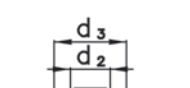
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded Shank End Mill Bodies

	15 242 A	15	9.52	0,8	27.5	0.9	-	M 8	13.8	2	314-318 A, B, C, D, E	
	20 242 A	20	9.52	0,8	27.5	0.9	-	M 10	18	3	319-323 A, B, C, D, E	
	25 242 A	25	9.52	0,8	32.5	0.9	-	M 12	21	4	324-329 A, B, C, D, E	
	32 242 A	32	9.52	0,8	37.5	0.9	-	M 16	29	5	330-335 A, B, C, D, E	
	 25 500 A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405							

Indexable Inserts

for further details, see p. 174

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

ADEW | $r 0.8$

	02 78 835							HSC 05	PVTi
	02 78 850							P25	PVTi
	02 78 860 D							K10	PVDiaN

SQUARE SH. FACE MILLING + SLOTING CUTTER BODIES

for LDLX inserts | $r=0.4$

Tools for machine building and toolmaking, especially characterized for mild steel, non-ferrous materials such as aluminium, copper and plastics



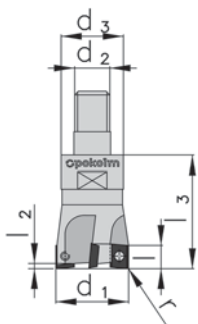
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded Shank End Mill Bodies



15 240	15	8	0,4	27.5	0.5	-	M 8	13.8	2	314-318 A, B, C, D, E	
20 240	20	8	0,4	27.5	1.2	-	M 10	18	3	319-323 A, B, C, D, E	
25 240	25	8	0,4	32.5	1.3	-	M 12	21	4	324-329 A, B, C, D, E	

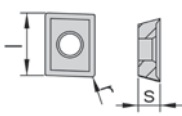
Indexable Inserts

for further details, see p. 174

catalogue no.

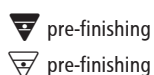
steel high-temperature alloys stainless steel cast iron non-ferrous materials hardened steel Carbide Grade Coating

LDLX | $r 0.4$



02 77 850							P25	PVTi
02 77 860							K10	PVTi
02 77 860 D							K10	PVDiaN

major application
minor application



Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

Index



SQUARE SH. FACE MILLING + SLOTING CUTTER BODIES

for CDHT inserts | $r=0.8$

These universal milling cutters for machine building and toolmaking are characterized by their low energy consumption.

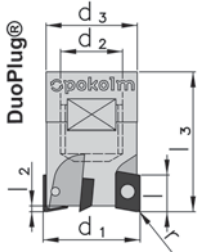
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

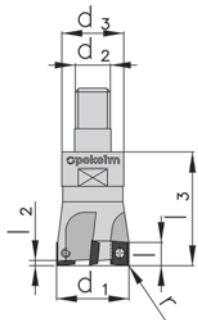
ref. pg. arbors
ref. accessories
features

DuoPlug®



16 244 SG	16	9.3	0,8	34.5	1.2	-	M 10	15	2	310-311 A, B, C, D, E	   
20 244 SG	20	9.3	0,8	32.5	1.2	-	M 12	18.5	3	310-311 A, B, C, D, E	   
25 244 SG	25	9.3	0,8	36	1.6	-	M 16	23.5	4	310-311 A, B, C, D, E	   
 25 500 A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405							

Threaded Shank End Mill Bodies



16 244	16	9.3	0,8	27.5	1.2	-	M 8	13.8	2	314-318 A, B, C, D, E	  
20 244	20	9.3	0,8	27.5	1.2	-	M 10	18	3	319-323 A, B, C, D, E	  
25 244	25	9.3	0,8	32.5	1.6	-	M 12	21	4	324-329 A, B, C, D, E	  
32 244	32	9.3	0,8	37.5	1.6	-	M 16	29	5	330-335 A, B, C, D, E	  
42 244	42	9.3	0,8	37.5	1.6	-	M 16	29	6	330-335 A, B, C, D, E	  
 25 500 A > Page 401	 07 500 B > Page 403			 TV 04-1 C > Page 404			 T7 500 D > Page 405		 T7 502 E > Page 405		

Indexable Inserts

for further details, see p. 174

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

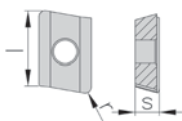
non-ferrous
materials

hardened steel

Carbide Grade

Coating

CBHT | $r 0.8$



03 78 835							HSC 05	PVTi
03 78 840							P40	PVTi
03 78 850							P25	PVTi

RHOM. SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

for XDHW | XDHT rhombic inserts | r 1

Universal milling cutters for finishing and profile milling with small radii.

- particularly smooth operating in corners and pockets
- low energy consumption



1/2 ▶

Milling cutter bodies

catalogue no.		d ₁	l	r	l ₃	l ₂	l ₁	d ₂	d ₃	z	ref. pg. arbors ref. accessories features	
DuoPlug®												
	16 281 SG	16	6.5	1	31	1.3	-	M 10	15	2	310-311 A, B, C, D, E	✓
	20 281 SG	20	6.5	1	31.5	1.3	-	M 12	18.5	3	310-311 A, B, C, D, E	✓
	25 281 SG	25	6.5	1	37.5	1.3	-	M 16	23.5	4	310-311 A, B, C, D, E	✓
	 25 500 A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405							

Indexable Inserts

for further details, see p. 176

catalogue no.		steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
XDHW r 1									
	02 79 835	▽		▽	▽		▽	HSC 05	PVTi
	02 79 892						▽	CBN for steel	
	02 79 894					▽		PCD	

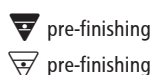
XDHT | r 1

	02 79 831P					▽		K10	polished
	02 79 880					▽		K10	PVTi
	02 79 880 D					▽		K10	PVDiaN

major application
minor application



roughing
roughing



pre-finishing
pre-finishing



finishing
finishing



RHOM. SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

for XDHW | XDHT rhombic inserts | r 1

Universal milling cutters for finishing and profile milling with small radii.

- particularly smooth operating in corners and pockets
- low energy consumption

2/2

Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies

	16 281	16	6.5	1	28.5	1.3	-	M 8	13.8	2	314-318 A, B, C, D, E	
	20 281	20	6.5	1	28.5	1.3	-	M 10	18	3	319-323 A, B, C, D, E	
	25 281	25	6.5	1	32.5	1.3	-	M 12	21	4	324-329 A, B, C, D, E	
	30 281	30	6.5	1	32.5	1.3	-	M 12	21	5	324-329 A, B, C, D, E	
	35 281	35	6.5	1	42.5	1.3	-	M 16	29	6	330-335 A, B, C, D, E	
	42 281	42	6.5	1	42.5	1.3	-	M 16	29	6	330-335 A, B, C, D, E	
	25 500 A > Page 401	07 500 B > Page 403			TV 04-1 C > Page 404			T7 500 D > Page 405			T7 502 E > Page 405	

Indexable Inserts

for further details, see p. 176

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

XDHW | r 1

	02 79 835							HSC 05	PVTi
	02 79 892							CBN for steel	
	02 79 894							PCD	

XDHT | r 1

	02 79 831P							K10	polished
	02 79 880							K10	PVTi
	02 79 880 D							K10	PVDiaN

RHOM. SQUARE SH. FACE MILLING + SLOTTING CUTTER BODIES

for XDHW | XDHT rhombic inserts | r 2

Universal milling cutters for finishing and profile milling with small radii.

- particularly smooth operating in corners and pockets
- low energy consumption



Service

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Milling Cutter Bodies

Indexable Inserts

Solid Carbide End Mills

Arbor and Adapter Systems

High-Speed Spindle Systems/Shrinking Technology

Accessories

Customized Products

Operation Data

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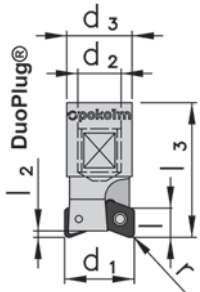
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

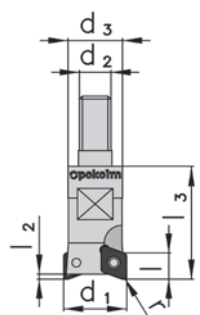
ref. pg. arbors
ref. accessories
features

DuoPlug®



16 282 SG	16	6.5	2	31	1.3	-	M 10	15	2	310-311 A, B, C, D, E	   
20 282 SG	20	6.5	2	31.5	1.3	-	M 12	18.5	3	310-311 A, B, C, D, E	   
25 282 SG	25	6.5	2	37.5	1.3	-	M 16	23.5	4	310-311 A, B, C, D, E	   
 25 500 A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405							

Threaded shank end mill bodies



16 282	16	6.5	2	28.5	1.3	-	M 8	13.8	2	314-318 A, B, C, D, E	  
20 282	20	6.5	2	28.5	1.3	-	M 10	18	3	319-323 A, B, C, D, E	  
25 282	25	6.5	2	32.5	1.3	-	M 12	21	4	324-329 A, B, C, D, E	 
30 282	30	6.5	2	32.5	1.3	-	M 12	21	5	324-329 A, B, C, D, E	 
35 282	35	6.5	2	42.5	1.3	-	M 16	29	6	330-335 A, B, C, D, E	 
 25 500 A > Page 401	 07 500 B > Page 403			 TV 04-1 C > Page 404			 T7 500 D > Page 405			 T7 502 E > Page 405	

Indexable Inserts

for further details, see p. 176

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

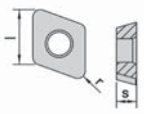
non-ferrous
materials

hardened steel

Carbide Grade

Coating

XDHW | r 2



02 79 835 R2					HSC 05	PVTi

major application
minor application

 roughing
 roughing

 pre-finishing
 pre-finishing

 finishing
 finishing



FACE MILLING CUTTERS

Baseworx®

ReMARKably economic Face Milling Cutters for highly efficient milling with large depths of cut.

These tools are outstandingly suitable through its reduced power consumption. In addition these milling cutters can be used for chamfering.

1/2 ▶

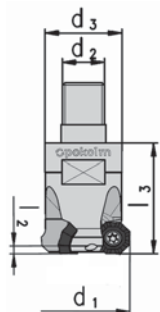
Milling cutter bodies

catalogue no.

d_1 l r^* l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies



3 35 288

35

-

42

3.5

-

M 16

29

3

330-335

A, B, C, D, E



40 505 K
A > Page 401

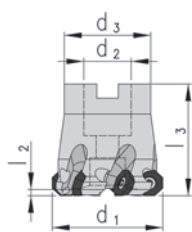
POKOLM
15 500
B > Page 403

TV 2-8
C > Page 404

T15 500
D > Page 405

T15 502
E > Page 405

Shell type milling cutter bodies



4 40 388

40

-

42

3.5

-

diam. 16

35

4

340-341

A, B, C, D, E, F



4 42 388

42

-

42

3.5

-

diam. 16

35

4

340-341

A, B, C, D, E, F



5 50 388

50

-

52

3.5

-

diam. 22

40

5

342-344

A, C, D, E, F



5 52 388

52

-

52

3.5

-

diam. 22

40

5

342-344

A, C, D, E, F



7 63 388

63

-

52

3.5

-

diam. 27

48

7

345-347

A, C, D, E, F



7 66 388

66

-

52

3.5

-

diam. 27

48

7

345-347

A, C, D, E, F



8 80 388

80

-

52

3.5

-

diam. 27

60

8

345-347

A, C, D, E, F



9 100 388

100

-

52

3.5

-

diam. 32

70

9

348

A, C, D, E, F



12 125 388

125

-

52

3.5

-

diam. 40

90

12

349

A, C, D, E, F



40 505 K
A > Page 401

GWSTPS81SK
B > Page 403

POKOLM
15 500
C > Page 403

TV 2-8
D > Page 404

T15 500
E > Page 405

T15 502
F > Page 405

Indexable Inserts

for further details, see p. 176

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

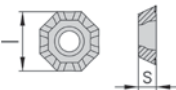
non-ferrous
materials

hardened steel

Carbide Grade

Coating

OFMW/OFET for Baseworx®

	03 88 831P							K10	polished
	03 88 840							P40	PVTi

major application
minor application

 roughing
 roughing

 pre-finishing
 pre-finishing

 finishing
 finishing



FACE MILLING CUTTERS

for SEEW square inserts

Our surface milling cutters allow very high feed rates and are characterized for its low energy consumption.
Also suitable for milling chamfers.

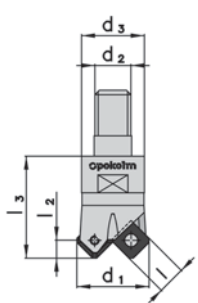
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

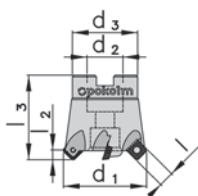
ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies



24 245	24	9.52		32	4.2	-	M 12	21	2	324-329 A, B, C, D, E	
30 245	30	9.52		33	4.2	-	M 12	21	3	324-329 A, B, C, D, E	
 30 500 A > Page 401	 10 500 B > Page 403			 TV 1-5 C > Page 404				 T10 500 D > Page 405	 T10 502 E > Page 405		

Shell type milling cutter bodies



42 345	42	9.52		44	4.2	-	diam. 16	35	5	340-341 A, B, C, D, E	
52 345	52	9.52		52.4	4.2	-	diam. 22	40	6	342-344 A, B, C, D, E	
66 345	66	9.52		52.4	4.2	-	diam. 27	48	7	345-347 A, B, C, D, E	
 30 500 A > Page 401	 10 500 B > Page 403			 TV 1-5 C > Page 404				 T10 500 D > Page 405	 T10 502 E > Page 405		

Indexable Inserts

for further details, see p. 176

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

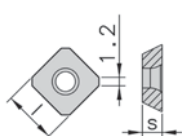
non-ferrous
materials

hardened steel

Carbide Grade

Coating

SEEW



03 09 850							P25	PVTi

END MILL BODIES FOR NON-FERROUS MATERIALS

for VDGT inserts | r 1

These milling cutters are especially suitable for milling aluminium, copper, plastics and graphite. It allows very easy cutting and very high cutting speeds and feed rates.

Only for roughing and pre-finishing operations!



Service

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Milling Cutter Bodies

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Solid Carbide End Mills

Arbor and Adapter Systems

High-Speed Spindle Systems/Shrinking Technology

Accessories

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Operation Data

Index

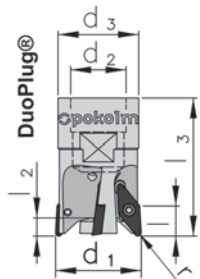
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

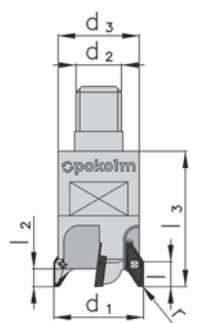
ref. pg. arbors
ref. accessories
features

DuoPlug®



16 261 SG	16	9	1	38	4	-	M 10	15	2	310-311 A, B, C, D, E	
20 261 SG	20	9	1	39.5	4	-	M 12	18.5	2	310-311 A, B, C, D, E	
25 261 SG	25	9	1	42.5	4	-	M 16	23.5	3	310-311 A, B, C, D, E	
 25 500 A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405							

Threaded shank end mill bodies



15 261	15	9	1	35.5	4	-	M 8	13.8	2	314-318 A, B, C, D, E	
20 261	20	9	1	35.5	4	-	M 10	18	2	319-323 A, B, C, D, E	
25 261	25	9	1	40	4	-	M 12	21	3	324-329 A, B, C, D, E	
32 261	32	9	1	47.5	4	-	M 16	29	4	330-335 A, B, C, D, E	
42 261	42	9	1	42.5	4	-	M 16	29	5	330-335 A, B, C, D, E	
 25 500 A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405							

Indexable Inserts

for further details, see p. 180

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

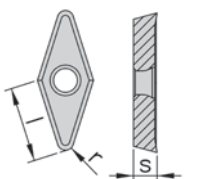
non-ferrous
materials

hardened steel

Carbide Grade

Coating

VDGT | r 1



02 11 820							K10	polished
02 11 860							K10	PVTi
02 11 860 D							K10	PVDiaN

major application
minor application

roughing
 pre-finishing

roughing
 pre-finishing

roughing
 pre-finishing



END MILL BODIES FOR NON-FERROUS MATERIALS

for VDGT inserts | r 1 | 3° axial clearance

These milling cutters are especially suitable for milling aluminium, copper, plastics and graphite. It allows very easy cutting and very high cutting speeds and feed rates. These inserts have a 3° axial clearance - a design specially for milling vertical walls.

Only for roughing and pre-finishing operations!

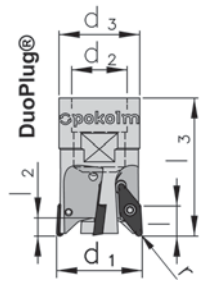
Milling cutter bodies

catalogue no.

d₁ l r l₃ l₂ l₁ d₂ d₃ z

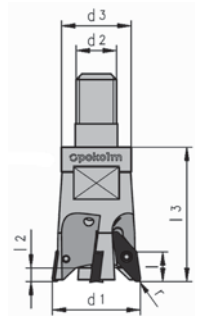
ref. pg. arbors
ref. accessories
features

DuoPlug®



16 261-3 SG	16	9	1	38	4	-	M 10	15	2	310-311 A, B, C, D, E	  
20 261-3 SG	20	9	1	39.5	4	-	M 12	18.5	2	310-311 A, B, C, D, E	  
25 261-3 SG	25	9	1	42.5	4	-	M 16	23.5	3	310-311 A, B, C, D, E	  
 25 500 A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405							

Threaded shank end mill bodies



15 261-3	15	9	1	35	4	-	M 8	13.8	2	314-318 A, B, C, D, E	☒ ☒ ☒
16 261-3	16	9	1	35.5	4	-	M 8	13.8	2	314-318 A, B, C, D, E	☒ ☒ ☒
20 261-3	20	9	1	35.5	4	-	M 10	18	2	319-323 A, B, C, D, E	☒ ☒ ☒
25 261-3	25	9	1	40	4	-	M 12	21	3	324-329 A, B, C, D, E	☒ ☒ ☒
32 261-3	32	9	1	47.5	4	-	M 16	29	4	330-335 A, B, C, D, E	☐ ☒ ☒
42 261-3	42	9	1	42.5	4	-	M 16	29	5	330-335 A, B, C, D, E	☐ ☒ ☒
 25 500 A > Page 401	 07 500 B > Page 403			 TV 04-1 C > Page 404			 T7 500 D > Page 405			 T7 502 E > Page 405	

Indexable Inserts

for further details, see p. 180

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

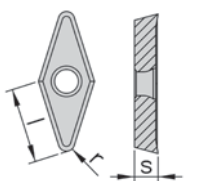
non-ferrous
materials

hardened steel

Carbide Grade

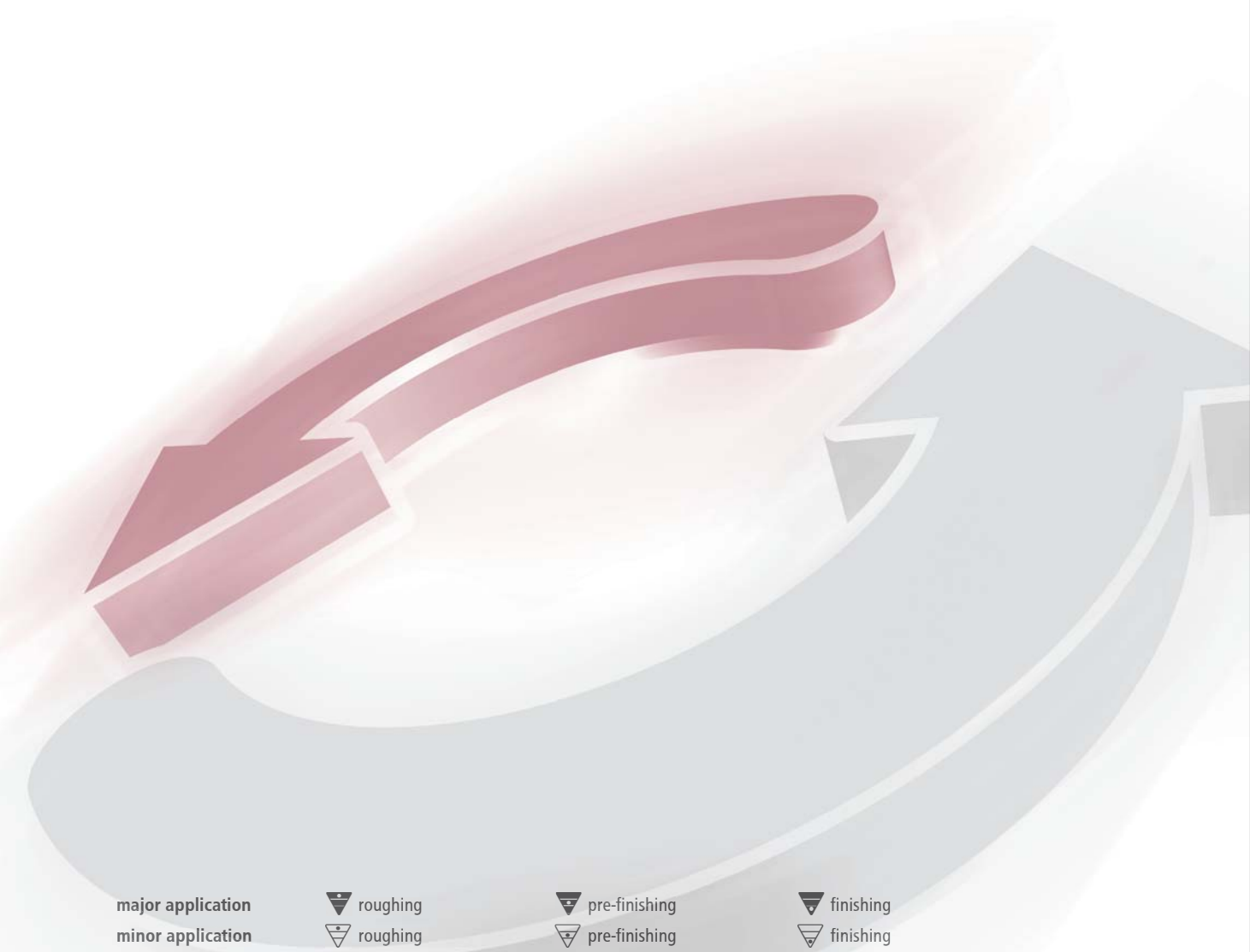
Coating

VDGT | r 1



02 11 820						K10	polished
02 11 860						K10	PVTi
02 11 860 D						K10	PVDiaN

pokoImCvoha
PREMIUMTOOLS. WE KNOW HOW.



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

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End Mills

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Accessories

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Index



END MILL BODIES FOR NON-FERROUS MATERIALS

for VCGT inserts | r 3

These milling cutters are especially suitable for milling aluminium, copper, plastics and graphite. It allows very easy cutting and very high cutting speeds and feed rates.

Only for roughing and pre-finishing operations!

1/2 ▶

Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies

	32 260	32	16	3	48	9.5	-	M 16	29	2	330-335 A, B, C, D, E	✓
	42 260	42	16	3	48	9.5	-	M 16	29	3	330-335 A, B, C, D, E	✓
 45 500 A > Page 401	 20 500 B > Page 403	 TV 2-8 C > Page 404		 T20 500 D > Page 405		 T20 502 E > Page 405						

Shell type milling cutter bodies

	42 360	42	16	3	57	9.5	-	diam. 16	35	3	340-341 A, B, C, D, E	✓
	52 360	52	16	3	57	9.5	-	diam. 22	40	3	342-344 A, B, C, D, E	✓
	66 360	66	16	3	57	9.5	-	diam. 27	48	4	345-347 A, B, C, D, E	✓
	80 360	80	16	3	57	9.5	-	diam. 27	60	5	345-347 A, B, C, D, E	✓
	100 360	100	16	3	57	9.5	-	diam. 32	70	6	348 A, B, C, D, E	?
	125 360	125	16	3	57	9.5	-	diam. 40	90	7	349 A, B, C, D, E	?
 45 500 A > Page 401	 20 500 B > Page 403	 TV 2-8 C > Page 404		 T20 500 D > Page 405		 T20 502 E > Page 405						

Indexable Inserts

for further details, see p. 180

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

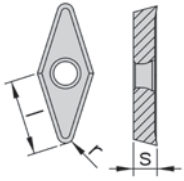
non-ferrous
materials

hardened steel

Carbide Grade

Coating

VCGT | r 3



05 22 820

05 22 860

05 22 860 D



K10

K10

K10

polished

PVTi

PVDiaN

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing



MIRROWORX®

TEHX

Milling instead of grinding is our slogan for these finishing milling cutters. Developed for producing smooth and levelled surfaces with enormous feed rates. These tools enter into grinding domains.

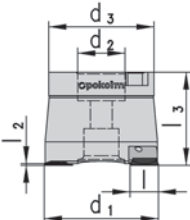
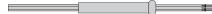
Milling cutter bodies

catalogue no.

d_1 l r l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Shell type milling cutter bodies

	2 42 384	42	14.32		43	1	-	diam. 16	35	2	340-341 A - G	 
	2 52 384	52	14.32		43	1	-	diam. 22	48	2	342-344 A, B, D, E, F, G	 
	2 66 384	66	14.32		53	1	-	diam. 27	60	2	345-347 A, B, D, E, F, G	 
	2 80 384	80	14.32		53	1	-	diam. 27	60	2	345-347 A, B, D, E, F, G	 
	2 100 384	100	14.32		53	1	-	diam. 32	70	2	348 A, B, D, E, F, G	 
	 35 500 A > Page 401	 45 500 L B > Page 401	 GWSTPS8ISK C > Page 403		 15 500 D > Page 403		 20 500 E > Page 403		 TV 2-8 F > Page 404			
 T15 502 G > Page 405												

Indexable Inserts

for further details, see p. 182

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

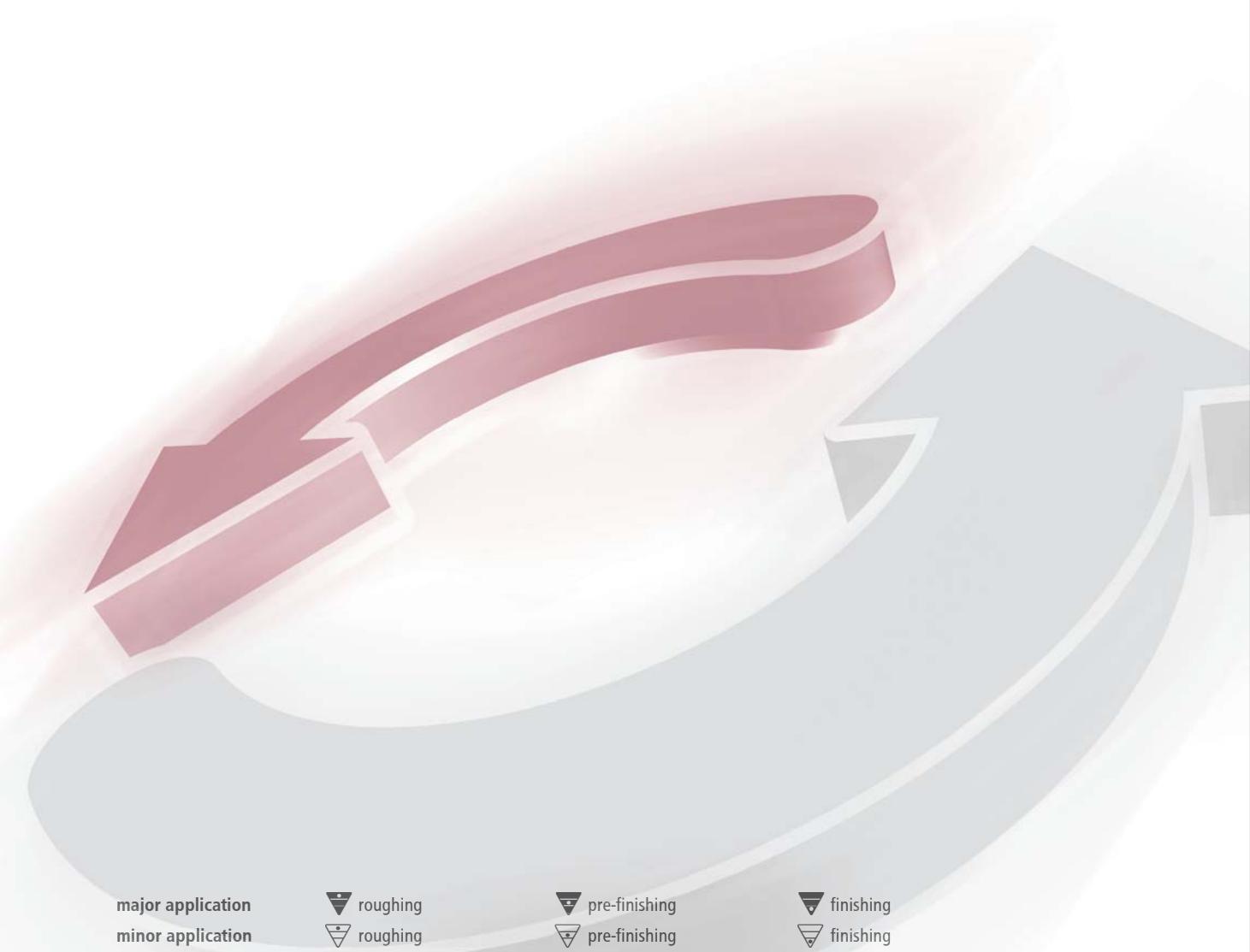
Carbide Grade

Coating

TEHX

	04 84 835							HSC 05	PVTi

pokoImCvoha
PREMIUMTOOLS. WE KNOW HOW.



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

Index



QUADWORX®

size S

- four cutting edges per insert for extremely efficient operations
 - very big metal removal rates and extremely easy cutting
 - as a standard, every tool has our patent protected incorporated insert seats and internal coolant supply
 - allows extremely high feed rates per tooth up to $f_z = 1.5 \text{ mm}$
- NEW: special developed insert-grade M 40 with concave moulding and PVST-coating, also suitable for machining stainless-, acid- and heat-resistant materials

1/2 ▶

Milling cutter bodies

catalogue no.												ref. pg. arbors ref. accessories features	
		d_1	l	r^*	l_3	l_2	l_1	d_2	d_3	z			
DuoPlug®	2 16 247 SG	16	7	1,3*	31	1	-	M 10	15	2	310-311 B, C, D, E, F	NEW	✓
	3 18 247 SG	18	7	1,3*	31	1	-	M 10	15	3	310-311 A, C, D, E, F	NEW	✓
	3 20 247 SG	20	7	1,3*	33	1	-	M 12	18.6	3	310-311 A, C, D, E, F	NEW	✓
	4 25 247 SG	25	7	1,3*	35	1	-	M 16	23.5	4	310-311 A, C, D, E, F	NEW	✓
	25 500 A > Page 401	25 500 K B > Page 401	07 500 C > Page 403	TV 04-1 D > Page 404	T7 500 E > Page 405	T7 502 F > Page 405							

NEW

End mill bodies with thread connections

		d_1	l	r^*	l_3	l_2	l_1	d_2	d_3	z			
	2 14 247	14	7	1,3*	28.5	1	-	M 8	13.8	2	314-318 B, C, D, E, F	NEW	✓
	2 16 247	16	7	1,3*	28.5	1	-	M 8	13.8	2	314-318 B, C, D, E, F	NEW	✓
	3 18 247	18	7	1,3*	28.5	1	-	M 8	13.8	3	314-318 A, C, D, E, F	NEW	✓
	3 20 247	20	7	1,3*	28.5	1	-	M 10	18	3	319-323 A, C, D, E, F	NEW	✓
	4 25 247	25	7	1,3*	32.5	1	-	M 12	21	4	324-329 A, C, D, E, F	NEW	✓
	25 500 A > Page 401	25 500 K B > Page 401	07 500 C > Page 403	TV 04-1 D > Page 404	T7 500 E > Page 405	T7 502 F > Page 405							

NEW

* corner radius to be programmed

NEW latest items!



available as long as stock lasts



on request



stock item, subject to confirmation

Indexable Inserts

for further details, see p. 184

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

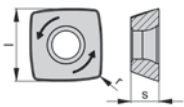
hardened steel

Carbide Grade

Coating

size S

NEW



02 47 837

02 47 842



HSC 05

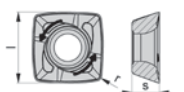
PVTi

P40

PVTi

size S | with concave moulding

NEW



02 47 896



M40

PVST

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

* corner radius to be programmed



QUADWORX®

size M

- four cutting edges per insert for extremely efficient operations
 - very big metal removal rates and extremely easy cutting
 - as a standard, every tool has our patent protected incorporated insert seats and internal coolant supply
 - allows extremely high feed rates per tooth up to $f_z = 2.2 \text{ mm}$
- NEW: special developed insert-grade M 40 with concave moulding and PVST-coating, also suitable for machining stainless-, acid- and heat-resistant materials

1/2 ▶

Milling cutter bodies

catalogue no.

d_1 l r^* l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

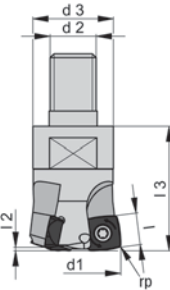
DuoPlug®

NEW

DuoPlug® 	2 22 248 SG	22	9	1,5*	35.5	1.5	-	M 12	18.5	2	310-311 A, B, C, D, E	   
	3 25 248 SG	25	9	1,5*	40	1.5	-	M 16	23.5	3	310-311 A, B, C, D, E	   
 30 500 A > Page 401	 10 500 B > Page 403		 TV 1-5 C > Page 404		 T10 500 D > Page 405		 T10 502 E > Page 405					

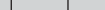
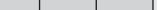
End mill bodies with thread connections

NEW

	2 22 248	22	9	1,5*	29	1.5	-	M 10	18	2	319-323 A, B, C, D, E	   
	3 25 248	25	9	1,5*	33	1.5	-	M 12	21	3	324-329 A, B, C, D, E	   
	4 30 248	30	9	1,5*	42	1.5	-	M 16	29	4	330-335 A, B, C, D, E	   
	4 32 248	32	9	1,5*	42	1.5	-	M 16	29	4	330-335 A, B, C, D, E	   
	4 35 248	35	9	1,5*	42	1.5	-	M 16	29	4	330-335 A, B, C, D, E	   
	5 35 248	35	9	1,5*	42	1.5	-	M 16	29	5	330-335 A, B, C, D, E	   
	5 42 248	42	9	1,5*	42	1.5	-	M 16	29	5	330-335 A, B, C, D, E	   
 30 500 A > Page 401	 10 500 B > Page 403			 TV 1-5 C > Page 404			 T10 500 D > Page 405			 T10 502 E > Page 405		

Shell type milling cutter bodies

NEW

	5 42 348	42	9	1,5*	42.5	1.5	-	diam. 16	35	5	340-341 A, B, C, D, E	   
	6 52 348	52	9	1,5*	52.5	1.5	-	diam. 22	40	6	342-344 A, B, C, D, E	   
 30 500 A > Page 401	 10 500 B > Page 403		 TV 1-5 C > Page 404		 T10 500 D > Page 405		 T10 502 E > Page 405					

* corner radius to be programmed

NEW latest items!



available as long as stock lasts



on request



stock item, subject to confirmation

Indexable Inserts

for further details, see p. 184

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

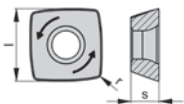
hardened steel

Carbide Grade

Coating

size M

NEW



03 48 842



03 48 846



03 48 852



03 48 860



P40

PVTi

P40

PVGO

P25

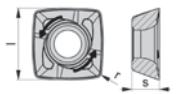
PVTi

K10

PVTi

size M | with concave moulding

NEW



03 48 896



M40

PVST

major application
minor application


roughing

roughing



pre-finishing

pre-finishing



finishing

finishing

* corner radius to be programmed



QUADWORX®

size L

- four cutting edges per insert for extremely efficient operations
 - very big metal removal rates and extremely easy cutting
 - as a standard, every tool has our patent protected incorporated insert seats and internal coolant supply
 - allows extremely high feed rates per tooth up to $f_z = 2.5 \text{ mm}$
- NEW: special developed insert-grade M 40 with concave moulding and PVST-coating, also suitable for machining stainless-, acid- and heat-resistant materials

1/2 ▶

Milling cutter bodies

catalogue no.

d_1 l r^* l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

End mill bodies with thread connections

NEW

	3 35 249	35	10	2,3*	42	2.5	-	M 16	29	3	330-335 A, B, C, D, E	✓ NEW
	4 42 249	42	10	2,3*	42	2.5	-	M 16	29	4	330-335 A, B, C, D, E	✓ NEW
	40 505 K A > Page 401	15 500 B > Page 403	TV 2-8 C > Page 404	T15 500 D > Page 405	T15 502 E > Page 405							

Shell type milling cutter bodies

NEW

	4 42 349	42	10	2,3*	42	2.5	-	diam. 16	35	4	340-341 A, C, D, E, F	✓ NEW
	5 52 349	52	10	2,3*	52	2.5	-	diam. 22	40	5	342-344 B, C, D, E, F	✓ NEW
	7 66 349	66	10	2,3*	52	2.5	-	diam. 27	48	7	345-347 B, C, D, E, F	✓ NEW
	8 80 349	80	10	2,3*	52	2.5	-	diam. 27	60	8	345-347 B, C, D, E, F	✓ NEW
	40 505 K A > Page 401	40 505 B > Page 401	15 500 C > Page 403	TV 2-8 D > Page 404	T15 500 E > Page 405	T15 502 F > Page 405						

* corner radius to be programmed

NEW latest items!



available as long as stock lasts



on request



stock item, subject to confirmation

Indexable Inserts

for further details, see p. 184

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

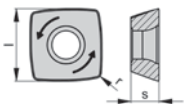
hardened steel

Carbide Grade

Coating

size L

NEW



04 49 842



04 49 846



04 49 852



04 49 860



P40

PVTi

P40

PVGO

P25

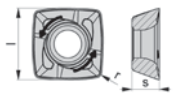
PVTi

K10

PVTi

size L | with concave moulding

NEW



04 49 896



M40

PVST

major application
minor application

 roughing
 roughing

 pre-finishing
 pre-finishing

 finishing
 finishing

* corner radius to be programmed

size S

- allows extremely high feed rates per tooth up to $f_z = 1.5 \text{ mm}$
- better utilization of insert because of its 3 effective cutting edges
- very smooth operation, especially in deep slots or profiles

Especially for roughing operations

catalogue no.

ref. pg. arbors
ref. accessories
features

DuoPlug®												
Detailed description: A technical drawing of the DuoPlug tool. It shows a side view with dimensions d1 (width of the base), d2 (width of the middle section), and d3 (width of the top section). It also shows a top view with dimensions 2 (width of the base) and 3 (width of the middle section). The word 'DuoPlug®' is written vertically on the left side.	2 16 272 SG	16	7	1,5*	38.5	1	-	M 10	15	2	310-311 A, B, C, D, E, F	
	3 20 272 SG	20	7	1,5*	39.5	1	-	M 12	18.5	3	310-311 A, B, C, D, E, F	
	4 25 272 SG	25	7	1,5*	41.5	1	-	M 16	23.5	4	310-311 A, B, C, D, E, F	
25 500 A > Page 401	07 500 B > Page 403	TV 04-1 C > Page 404	T7 500 D > Page 405	T7 502 E > Page 405	12 510 F > Page 405							

	2 16 272	16	7	1,5*	28.5	1	-	M 8	13.8	2	314-318 A, B, C, D, E, F	
	3 20 272	20	7	1,5*	28.5	1	-	M 10	18	3	319-323 A, B, C, D, E, F	
	4 25 272	25	7	1,5*	32.5	1	-	M 12	21	4	324-329 A, B, C, D, E, F	
 25 500 A > Page 401	 07 500 B > Page 403	 TV 04-1 C > Page 404	 T7 500 D > Page 405	 T7 502 E > Page 405	 12 510 F > Page 405							

catalogue no.

steel

high-temperature alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

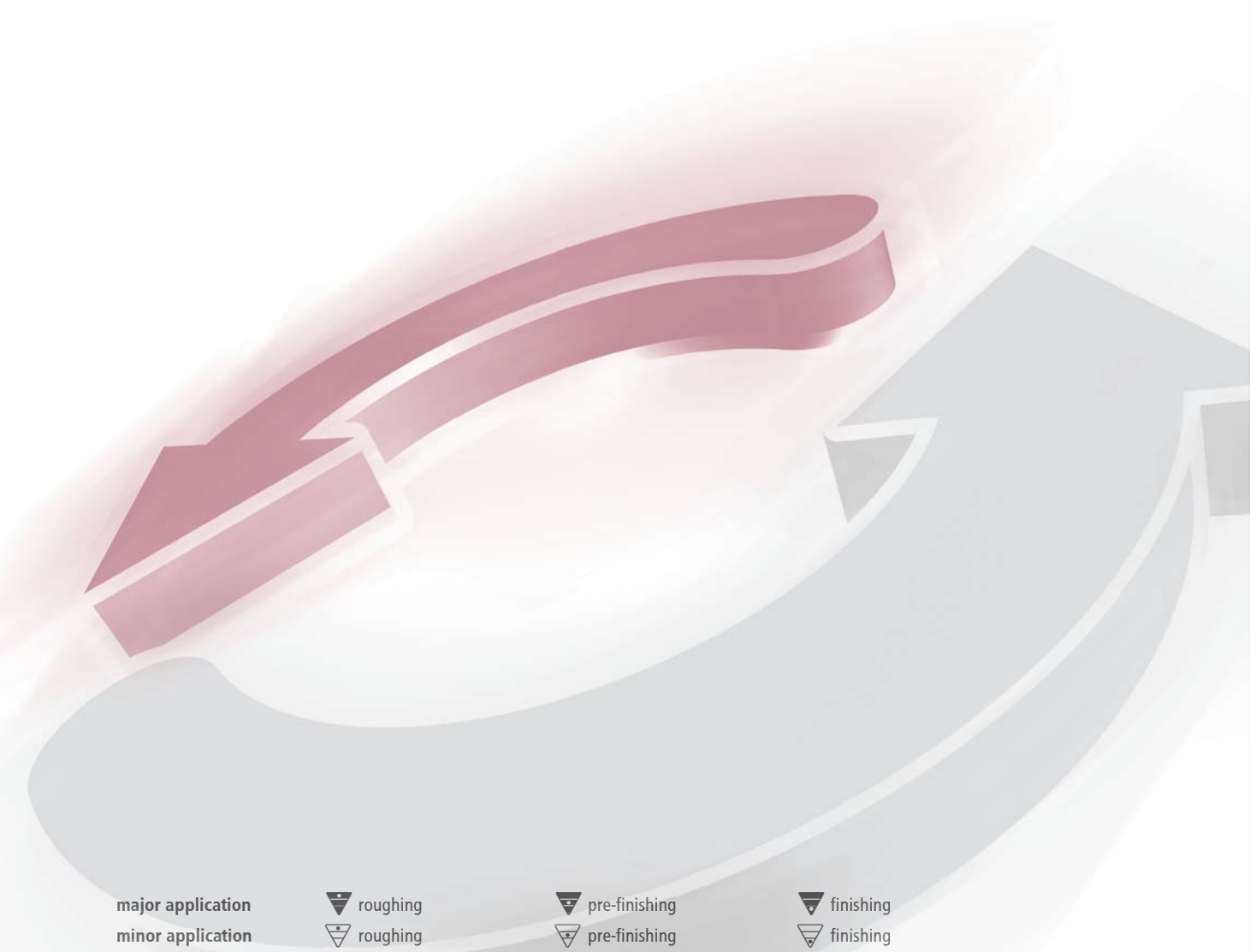
	02 72 835							HSC 05	PVTi
	02 72 840							P40	PVTi

?

☒

☒ stock item, subject to confirmation

pokoImCvoha
PREMIUMTOOLS. WE KNOW HOW.



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

Index



TRIGAWORX®

size M

- allows extremely high feed rates per tooth up to $f_z = 2.0 \text{ mm}$
- better utilization of insert because of its 3 effective cutting edges
- very smooth operation, especially in deep slots or profiles

Especially for roughing operations

1/2 ▶

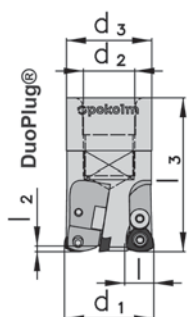
Milling cutter bodies

catalogue no.

d_1 l r^* l_3 l_2 l_1 d_2 d_3 z

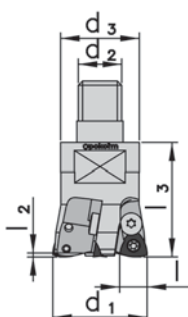
ref. pg. arbors
ref. accessories
features

DuoPlug®



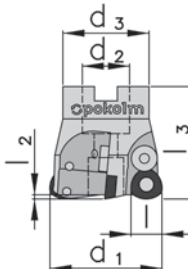
2 25 273 SG	25	10.3	1,9*	47.5	1.5	-	M 16	23.5	2	310-311 A, B, C, D, E, F	
 30 500 A > Page 401	 35 511 B > Page 401	 10 500 C > Page 403		 TV 1-5 D > Page 404		 T10 500 E > Page 405		 T10 502 F > Page 405			

Threaded shank end mill bodies



2 25 273	25	10.3	1,9*	32.5	1.5	-	M 12	22.5	2	324-329 A, B, C, D, E, F	
3 30 273	30	10.3	1,9*	42.5	1.5	-	M 16	29	3	330-335 A, B, C, D, E, F	
3 35 273	35	10.3	1,9*	42.5	1.5	-	M 16	29	3	330-335 A, B, C, D, E, F	
4 35 273	35	10.3	1,9*	42.5	1.5	-	M 16	29	4	330-335 A, B, C, D, E, F	
4 42 273	42	10.3	1,9*	42.5	1.5	-	M 16	29	4	330-335 A, B, C, D, E, F	
 30 500 A > Page 401	 35 511 B > Page 401	 10 500 C > Page 403		 TV 1-5 D > Page 404		 T10 500 E > Page 405		 T10 502 F > Page 405			

Shell type milling cutter bodies



4 42 373	42	10.3	1,9*	42.5	1.5	-	diam. 16	35	4	340-341 A, B, C, D, E, F	
5 52 373	52	10.3	1,9*	52.5	1.5	-	diam. 22	40	5	342-344 A, B, C, D, E, F	
 30 500 A > Page 401	 35 511 B > Page 401	 10 500 C > Page 403		 TV 1-5 D > Page 404		 T10 500 E > Page 405		 T10 502 F > Page 405			

* corner radius to be programmed

latest items!

available as long as stock lasts

on request

stock item, subject to confirmation

Indexable Inserts

for further details, see p. 188

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

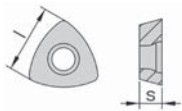
non-ferrous
materials

hardened steel

Carbide Grade

Coating

size M



03 73 835



03 73 840



03 73 850



HSC 05

PVTi

P40

PVTi

P25

PVTi

major application
minor application

 roughing
 roughing

 pre-finishing
 pre-finishing

 finishing
 finishing

* corner radius to be programmed



TRIGAWORX®

size L

- allows extremely high feed rates per tooth up to $f_z = 3.0 \text{ mm}$
- better utilization of insert because of its 3 effective cutting edges
- very smooth operation, especially in deep slots or profiles

Especially for roughing operations

Milling cutter bodies

catalogue no.

d_1 l r^* l_3 l_2 l_1 d_2 d_3 z

ref. pg. arbors
ref. accessories
features

Threaded shank end mill bodies

	2 32 274	32	14.3	4,6*	42.5	2	-	M 16	29	2	330-335 A, B, C, D, E, F	
	45 500 A > Page 401	10 510 B > Page 403	20 500 C > Page 403	TV 2-8 D > Page 404	T20 500 E > Page 405	T20 502 F > Page 405						

Shell type milling cutter bodies

	4 52 374	52	14.3	4,6*	52.5	2	-	diam. 22	40	4	342-344 A, B, C, D, E, F	
	4 66 374	66	14.3	4,6*	52.5	2	-	diam. 27	48	4	345-347 A, B, C, D, E, F	
	5 80 374	80	14.3	4,6*	52.5	2	-	diam. 27	60	5	345-347 A, B, C, D, E, F	
	45 500 A > Page 401	10 510 B > Page 403	20 500 C > Page 403	TV 2-8 D > Page 404	T20 500 E > Page 405	T20 502 F > Page 405						

Indexable Inserts

for further details, see p. 188

catalogue no.

steel

high-temperature
alloys

stainless steel

cast iron

non-ferrous
materials

hardened steel

Carbide Grade

Coating

size L

	04 74 840									P40	PVTi

* corner radius to be programmed

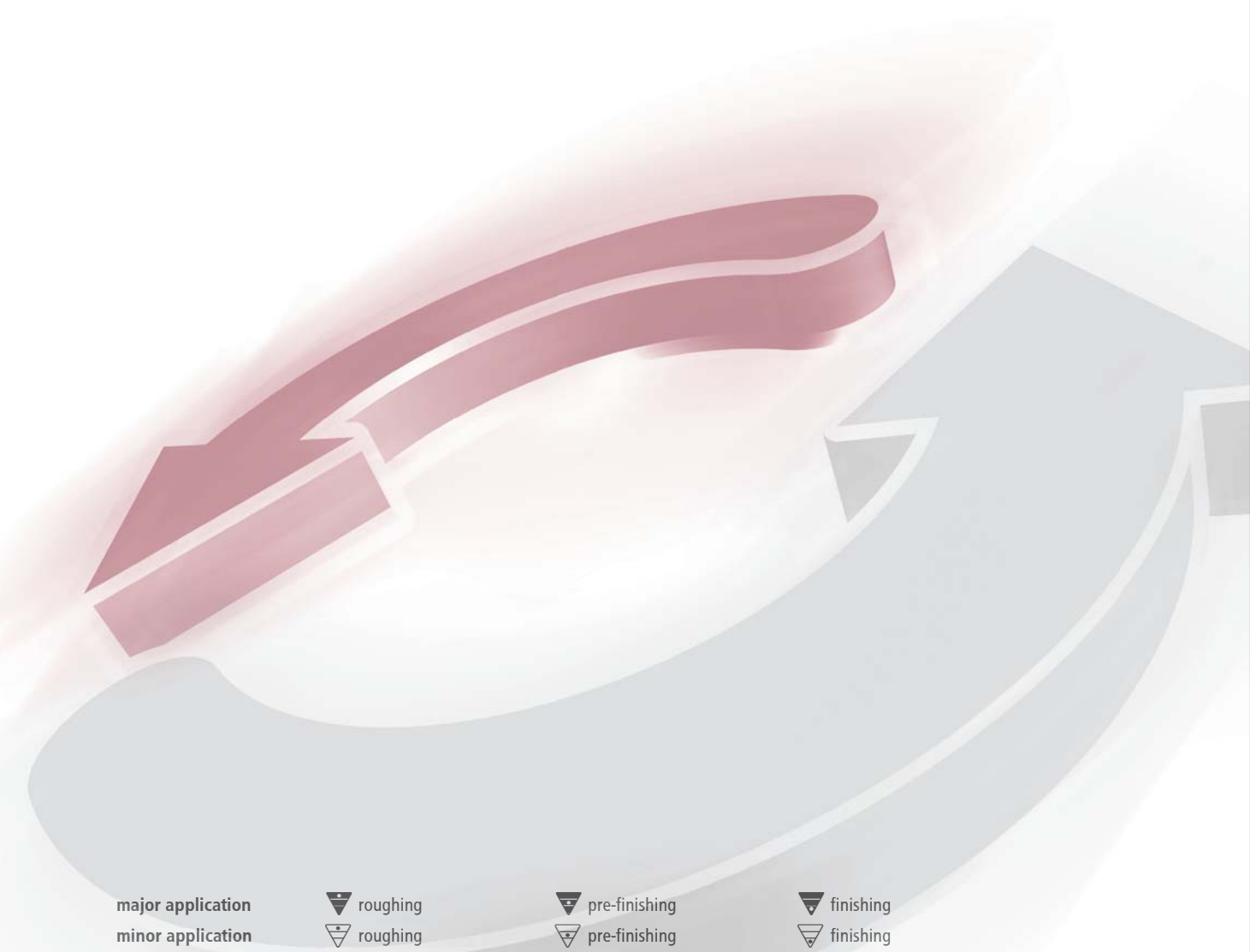
latest items!

available as long as stock lasts

on request

stock item, subject to confirmation

pokoImCvoha
PREMIUMTOOLS. WE KNOW HOW.



major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

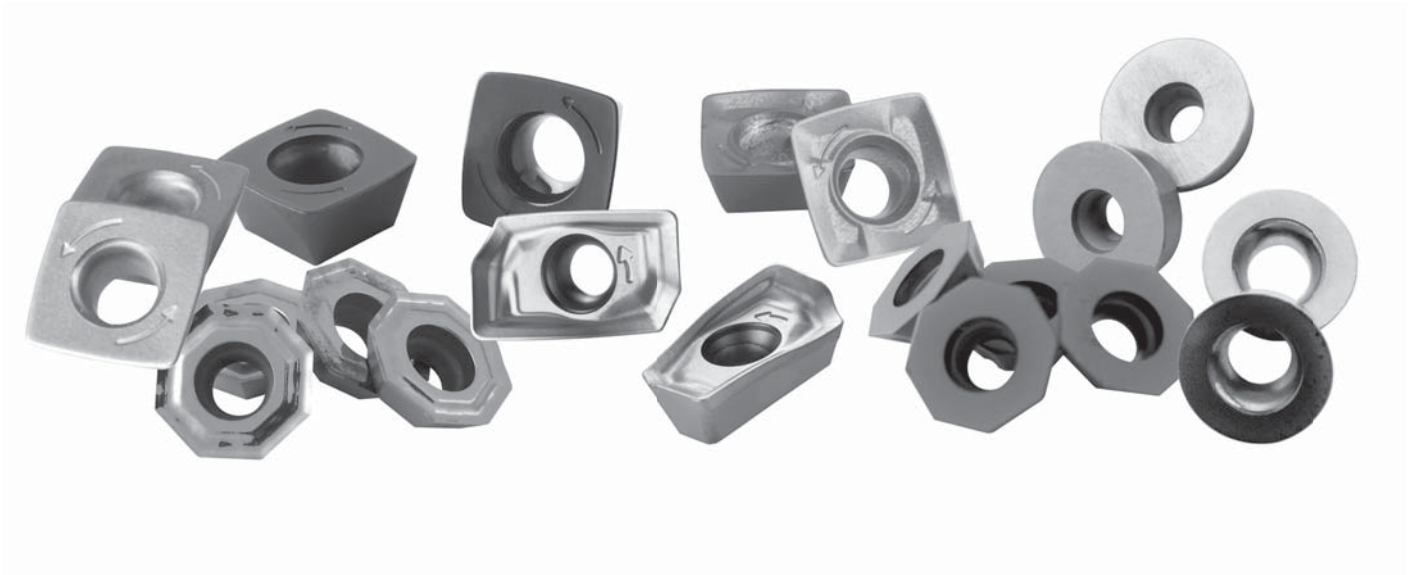
Accessories

Customized
Products

Operation Data

Index

INDEXABLE INSERTS



The complete range.

Our carefully planned, wide variety of indexable inserts is one of the highlights of the Pokolm-Voha program.

A perfect complement to our milling cutter program, it offers a wide selection of carbide grades, geometries, and different application possibilities. The range provides an optimum solution for every task:

Diameters from 5 to 20 mm (radii of 2.5 to 10 mm), different shapes, carbide grades, and coatings – along with a great variety of milling cutter bodies, our patent-protected insert seats, and arbor systems – allow every individual combination.

All Pokolm-Voha inserts have been developed based on shop-tested applications by our customers, and we improve our inserts to meet every new challenge.

This constant and innovative developmental process, and a remarkably intensive cooperation with our carbide suppliers and coating partners, guarantee state-of-the-art types of inserts at all times.

INDEXABLE INSERTS

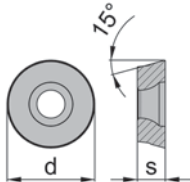
	Page
Indexable round inserts	
r 2.5	140
r 3.5 x 1.99 mm width	142
r 3.5 x 2.38 mm width	144
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Slotworx®-indexable inserts	
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Rectangular indexable inserts	ADEW LDLX CDHT 174
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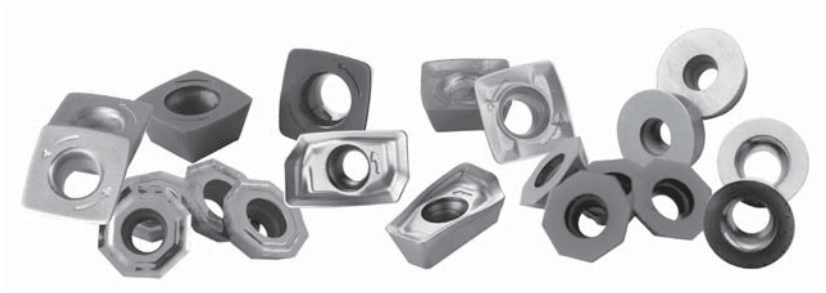


INDEXABLE ROUND INSERTS

r 2.5

Indexable inserts

Indexable inserts	catalogue no.	DIN Specification	Carbide Grade	Coating					Torx Screw
					d	s	r		
RDHX									
	01 05 835	RDHX 0501 M0T	HSC 05	PVTi	5	1.5	2.5	M 2.0	
	01 05 850	RDHX 0501 M0T	P25	PVTi	5	1.5	2.5	M 2.0	
	01 05 870	RDHX 0501 M0T	cermet	PVTi	5	1.5	2.5	M 2.0	



steel		high-temperature alloys		stainless steel		cast iron		non-ferrous materials		hardened steel		bodies on page		features	
												48			
												48			
												48			

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

Service

Know-How

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Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

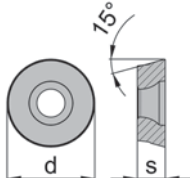
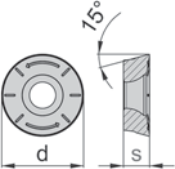
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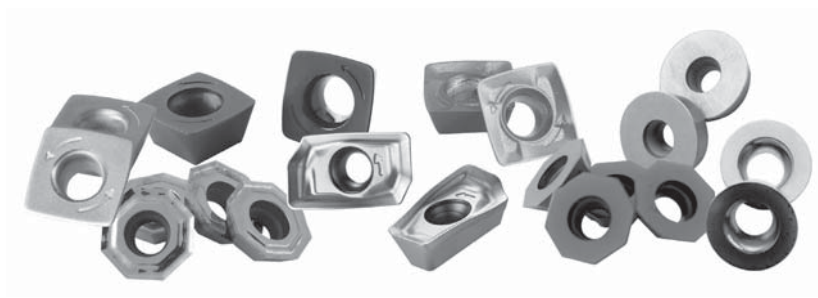


INDEXABLE ROUND INSERTS

r 3.5 x 1.99 mm width

Indexable inserts

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw
RDHX									
	01 07 835	RDHX 07T1 M0T	HSC 05	PVTi	7	1.99	3.5	M 2.5	
	01 07 840	RDHX 07T1 M0T	P40	PVTi	7	1.99	3.5	M 2.5	
	01 07 842	RDEX 07T1 M0T	P40	PVSR	7	1.99	3.5	M 2.5	
	01 07 850	RDHX 07T1 M0T	P25	PVTi	7	1.99	3.5	M 2.5	
	01 07 860	RDHX 07T1 M0T	K10	PVTi	7	1.99	3.5	M 2.5	
	01 07 870	RDHX 07T1 M0T	cermet	PVTi	7	1.99	3.5	M 2.5	
RDHX concave moulding									
	01 07 831P	RDHX 07T1 M0E	K10	polished	7	1.99	3.5	M 2.5	
	01 07 880 D	RDHX 07T1 M0E	K10	PVDiaN	7	1.99	3.5	M 2.5	
	01 07 880	RDHX 07T1 M0E	K10	PVTi	7	1.99	3.5	M 2.5	



steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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							50	
							50	
							50	
							50	
							50	
							50	

							50	
							50	
							50	

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

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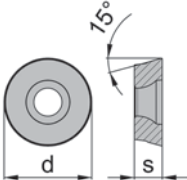
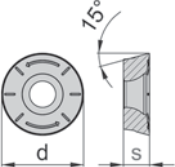
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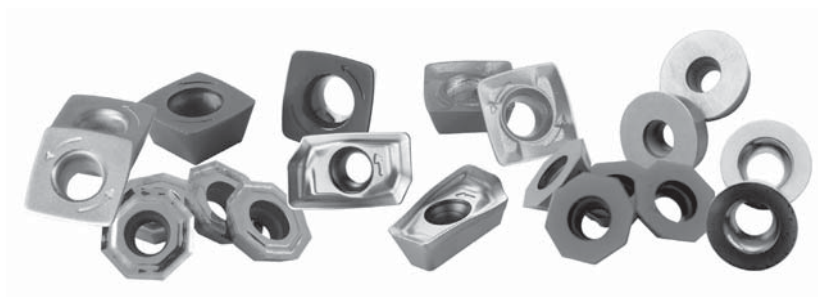


INDEXABLE ROUND INSERTS

r 3.5 x 2.38 mm width

Indexable inserts

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw
RDHX									
	02 07 835	RDHX 0702 M0T	HSC 05	PVTi	7	2.38	3.5	M 2.5	
	02 07 840	RDHX 0702 M0T	P40	PVTi	7	2.38	3.5	M 2.5	
	02 07 842	RDEX 0702 M0T	P40	PVSR	7	2.38	3.5	M 2.5	
	02 07 844	RDHX 0702 M0T	P40	PVML	7	2.38	3.5	M 2.5	
	02 07 850	RDHX 0702 M0T	P25	PVTi	7	2.38	3.5	M 2.5	
	02 07 860	RDHX 0702 M0T	K10	PVTi	7	2.38	3.5	M 2.5	
	02 07 870	RDHX 0702 M0T	cermet	PVTi	7	2.38	3.5	M 2.5	
	02 07 892	RDHX 0702 M0T	CBN for steel		7	2.38	3.5	M 2.5	
RDHX concave moulding									
	02 07 831P	RDHX 0702 M0E	K10	polished	7	2.38	3.5	M 2.5	
	02 07 880	RDHX 0702 M0E	K10	PVTi	7	2.38	3.5	M 2.5	
	02 07 880 D	RDHX 0702 M0E	K10	PVDiaN	7	2.38	3.5	M 2.5	
	02 07 897	RDPX 0702 M0T	P25	PVGO	7	2.38	3.5	M 2.5	

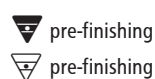


steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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							54	
							54	
							54	
							54	
							54	
							54	
							54	
							54	

						54	
						54	
						54	
						54	

major application
minor application



Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
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Systems/Shrinking
Technology

Accessories

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Products

Operation Data

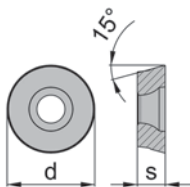
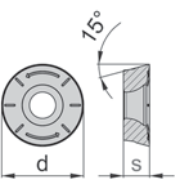
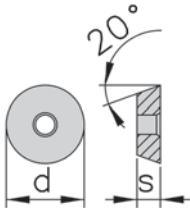
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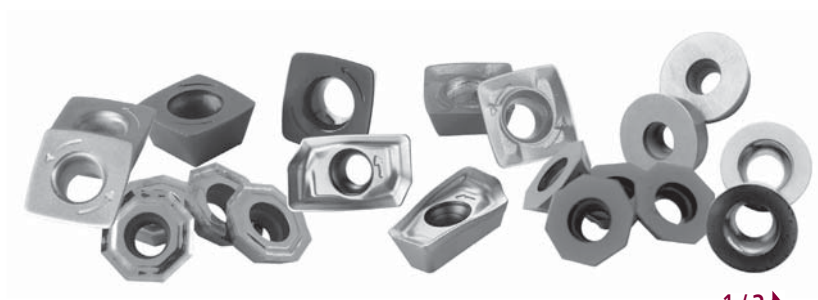


INDEXABLE ROUND INSERTS

r 5

Indexable inserts

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw
RDHX									
	02 10 835	RDHX 1003 M0T	HSC 05	PVTi	10	3.18	5	M 3.5	
	02 10 837	RDMX 1003 M0T	HSC 05	PVFN	10	3.18	5	M 3.5	
	02 10 840	RDHX 1003 M0T	P40	PVTi	10	3.18	5	M 3.5	
	02 10 842	RDEX 1003 M0T	P40	PVSR	10	3.18	5	M 3.5	
	02 10 844	RDHX 1003 M0T	P40	PVML	10	3.18	5	M 3.5	
	02 10 850	RDHX 1003 M0T	P25	PVTi	10	3.18	5	M 3.5	
	02 10 860	RDHX 1003 M0T	K10	PVTi	10	3.18	5	M 3.5	
	02 10 892	RDHX 1003 M0T	CBN for steel		10	3.18	5	M 3.5	
RDHX concave moulding									
	02 10 831P	RDHX 1003 M0T	K10	polished	10	3.18	5	M 3.5	
	02 10 848	RDMX 1003 M0T	P40	PVGO	10	3.18	5	M 3.5	
	02 10 880	RDHX 1003 M0T	K10	PVTi	10	3.18	5	M 3.5	
	02 10 880 D	RDHX 1003 M0T	K10	PVDiaN	10	3.18	5	M 3.5	
	02 10 897	RDPX 1003 M0T	P25	PVGO	10	3.18	5	M 3.5	
REHX									
	02 10 834	REHX 1003 M0T	HSC 20	PVTi	10	3.18	5	M 3.0	
	02 10 835K	REHX 1003 M0T	HSC 05	PVTi	10	3.18	5	M 3.0	
	02 10 841	REHX 1003 M0T	P40	PVTi	10	3.18	5	M 3.0	
	02 10 895	REHX 1003 M0T	P40	PVGM	10	3.18	5	M 3.0	



1/2

steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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						56	✓
						56	✓
						56	✓
						56	✓
						56	✓
						56	✓
						56	✓
						56	✓

						56	✓
						56	✓
						56	✓
						56	✓
						56	✓

						62	✓
						62	✓
						62	✓
						62	✓

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

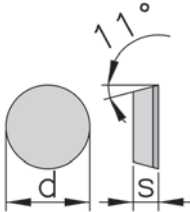
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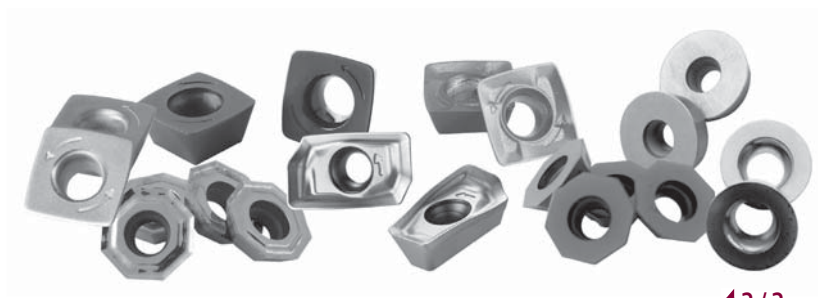


INDEXABLE ROUND INSERTS

r 5

Indexable inserts

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw
RPHN (CBN)									
	02 10 092	RPHN 1003 M0	CBN for steel			10	3.18	5	
	02 10 093	RPHN 1003 M0	CBN for cast iron			10	3.18	5	



2/2

steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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						64	✓
						64	✓

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

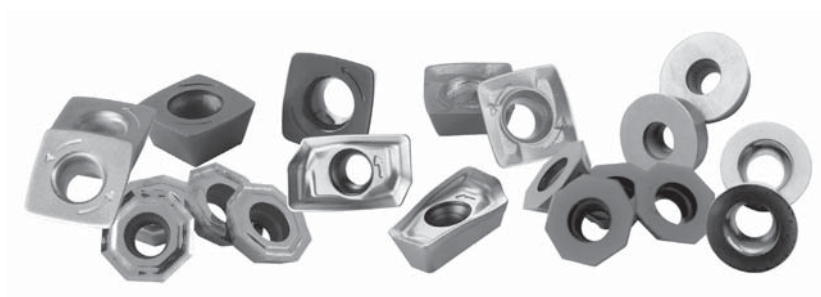


INDEXABLE ROUND INSERTS

r 6

Indexable inserts

	catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw	
RDHX									
	03 12 835K	RDHX 12T3 M0T	HSC 05	PVTi	12	3.97	6	M 3.5	
	03 12 837K	RDMX 12T3 M0T	HSC 05	PVFN	12	3.97	6	M 3.5	
	03 12 840K	RDHX 12T3 M0T	P40	PVTi	12	3.97	6	M 3.5	
	03 12 842K	RDEX 12T3 M0T	P40	PVSR	12	3.97	6	M 3.5	
	03 12 844K	RDHX 12T3 M0T	P40	PVML	12	3.97	6	M 3.5	
	03 12 850K	RDHX 12T3 M0T	P25	PVTi	12	3.97	6	M 3.5	
	03 12 860K	RDHX 12T3 M0T	K10	PVTi	12	3.97	6	M 3.5	
	03 12 870K	RDHX 12T3 M0T	cermet	PVTi	12	3.97	6	M 3.5	
RDHX concave moulding									
	03 12 831P	RDHX 12T3 M0T	K10	polished	12	3.97	6	M 3.5	
	03 12 848K	RDMX 12T3 M0T	P40	PVGO	12	3.97	6	M 3.5	
	03 12 880	RDHX 12T3 M0T	K10	PVTi	12	3.97	6	M 3.5	
	03 12 880 D	RDHX 12T3 M0T	K10	PVDiaN	12	3.97	6	M 3.5	
	03 12 897K	RDPX 12T3 M0T	P25	PVGO	12	3.97	6	M 3.5	
REHX									
	03 12 834K	REHX 12T3 M0T	HSC 20	PVTi	12	3.97	6	M 3.5	
	03 12 841K	REHX 12T3 M0T	P40	PVTi	12	3.97	6	M 3.5	
	03 12 895K	REHX 12T3 M0T	P40	PVGM	12	3.97	6	M 3.5	



steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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							66	
							66	
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							66	
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							66	

							66	
							66	
							66	
							66	
							66	

							70	
							70	
							70	

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

Service

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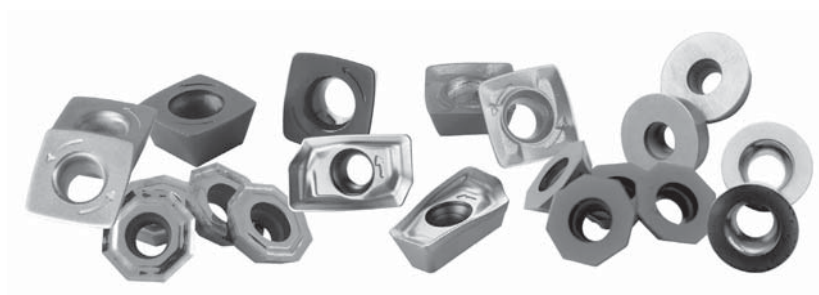


INDEXABLE ROUND INSERTS

r 8

Indexable inserts

	catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw	
RDHX									
	04 16 835	RDHX 1604 M0T	HSC 05	PVTi	16	4.76	8	M 4.5	
	04 16 840	RDHX 1604 M0T	P40	PVTi	16	4.76	8	M 4.5	
	04 16 842	RDEX 1604 M0T	P40	PVSR	16	4.76	8	M 4.5	
	04 16 844	RDHX 1604 M0T	P40	PVML	16	4.76	8	M 4.5	
	04 16 850	RDHX 1604 M0T	P25	PVTi	16	4.76	8	M 4.5	
	04 16 860	RDHX 1604 M0T	K10	PVTi	16	4.76	8	M 4.5	
RDHX concave moulding									
	04 16 831P	RDHX 1604 M0T	K10	polished	16	4.76	8	M 4.5	
	04 16 848	RDMX 1604 M0T	P40	PVGO	16	4.76	8	M 4.5	
	04 16 880	RDHX 1604 M0T	K10	PVTi	16	4.76	8	M 4.5	
	04 16 897	RDPX 1604 M0T	P25	PVGO	16	4.76	8	M 4.5	
REHX									
	04 16 834	REHX 1604 M0T	HSC 20	PVTi	16	4.76	8	M 4.5	
	04 16 841	REHX 1604 M0T	P25	PVTi	16	4.76	8	M 4.5	
	04 16 895	REHX 1604 M0T	P40	PVGM	16	4.76	8	M 4.5	



steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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							72	
							72	
							72	
							72	
							72	
							72	

							72	
							72	
							72	
							72	

							76	
							76	
							76	

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

Service

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End Mills

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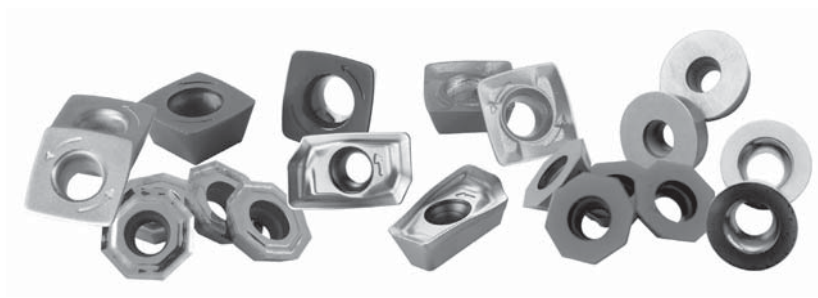


INDEXABLE ROUND INSERTS

r 10

Indexable inserts

	catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw	
RDHX									
	06 20 835	RDMX 2006 M0T	HSC 05	PVTi	20	6	10	M 4.5	
	06 20 840	RDMX 2006 M0T	P40	PVTi	20	6	10	M 4.5	
	06 20 844	RDMX 2006 M0T	P40	PVML	20	6	10	M 4.5	
	06 20 850	RDMX 2006 M0T	P25	PVTi	20	6	10	M 4.5	
	06 20 860	RDMX 2006 M0T	K10	PVTi	20	6	10	M 4.5	
RDHX concave moulding									
	06 20 831P	RDHT 2006 M0T	K10	polished	20	6	10	M 4.5	
	06 20 880	RDHT 2006 M0T	K10	PVTi	20	6	10	M 4.5	
	06 20 880 D	RDHT 2006 M0T	K10	PVDiaN	20	6	10	M 4.5	
RFHX									
	06 20 843	RFMX 2006 M0T	P40	PVML	20	6	10	M 4.5	



steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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							78	
							78	
							78	
							78	
							78	

							78	
							78	
							78	

							80	

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

Service

Know-How

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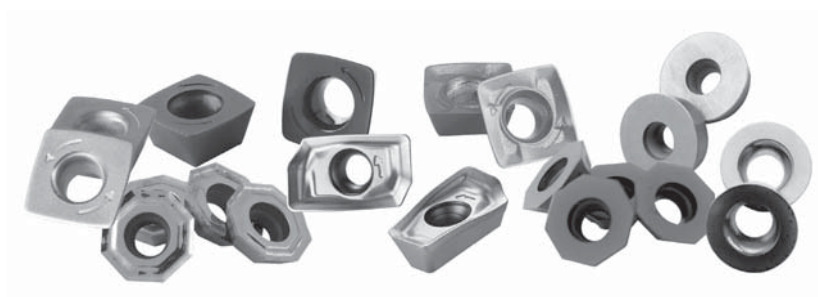
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BALL NOSE INDEXABLE INSERTS FOR WAVEWORX®

r 8 | r 10 | r 12.5 | r 16

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw
r 8									
	03 16 850		P25	PVML	15.6	3.18	8	M 2.5	
r 10									
	04 20 850		P25	PVML	19.6	4.4	10	M 3.0	
r 12.5									
	05 25 850		P25	PVML	24.5	5	12.5	M 4.0	
r 16									
	06 32 850		P25	PVML	30.7	6.3	16	M 4.0	



steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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	▽					81	✓

	▽					82	✓

	▽					83	✓

	▽					84	✓

major application
minor application

▽ roughing
▽ roughing

▽ pre-finishing
▽ pre-finishing

▽ finishing
▽ finishing

Service

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End Mills

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Systems/Shrinking
Technology

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Products

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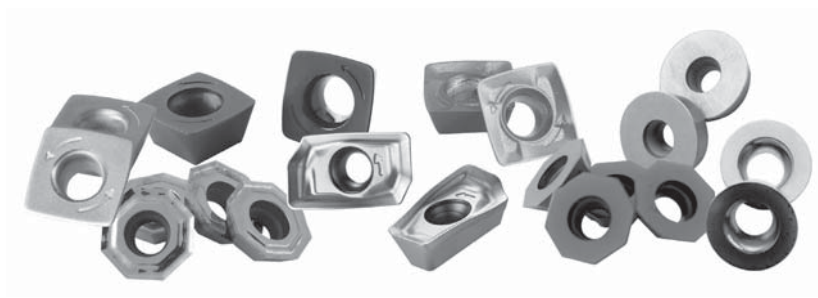
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INDEXABLE ROUND INSERTS WITH 4 CUTTING EDGES

r 5 | r 6 | r 8 | r 10

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw
r 5									
	10 10 860	ROHX 1002	K05	PVTi	10	2.5	5	M 3.5	
r 6									
	10 12 860	ROHX 1203	K05	PVTi	12	3	6	M 4.0	
r 8									
	10 16 860	ROHX 16T3	K05	PVTi	16	4	8	M 5.0	
r 10									
	10 20 860	ROHX 2004	K05	PVTi	20	5	10	M 5.0	



steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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	▽	▽	▽	▽	▽	▽	85	✓ ⚙️ 🔥

	▽	▽	▽	▽	▽	▽	86	✓ ⚙️ 🔥

	▽	▽	▽	▽	▽	▽	87	✓ ⚙️ 🔥

	▽	▽	▽	▽	▽	▽	88	✓ ⚙️ 🔥

major application
minor application

▽ roughing
▽ roughing

▽ pre-finishing
▽ pre-finishing

▽ finishing
▽ finishing

Service

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Bodies

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End Mills

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Systems

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BALL NOSE INDEXABLE INSERTS FOR UNIWORX®

r 4 | r 5 | r 6 | r 8 | r 10



Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw
r 4									
	08 835 V	ROHX 08T1	HSC 05	PVTi	8	2	4	M 3.0	
	08 836 V	ROHX 08T1	HSC 05	PVTiH	8	2	4	M 3.0	
	08 840 V	ROHX 08T1	P40	PVTi	8	2	4	M 3.0	
r 5									
	10 835 V	ROHX 10T2	HSC 05	PVTi	10	2.75	5	M 3.5	
	10 836 V	ROHX 10T2	HSC 05	PVTiH	10	2.75	5	M 3.5	
	10 840 V	ROHX 10T2	P40	PVTi	10	2.75	5	M 3.5	
r 6									
	12 835 V	ROHX 12XX	HSC 05	PVTi	12	3.3	6	M 4.0	
	12 836 V	ROHX 12XX	HSC 05	PVTiH	12	3.3	6	M 4.0	
	12 840 V	ROHX 12XX	P40	PVTi	12	3.3	6	M 4.0	
r 8									
	16 835 V	ROHX 16T3	HSC 05	PVTi	16	4	8	M 5.0	
	16 836 V	ROHX 16T3	HSC 05	PVTiH	16	4	8	M 5.0	
	16 840 V	ROHX 16T3	P40	PVTi	16	4	8	M 5.0	



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steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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						90	
						90	
						90	

						92	
						92	
						92	

						94	
						94	
						94	

						96	
						96	
						96	

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

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End Mills

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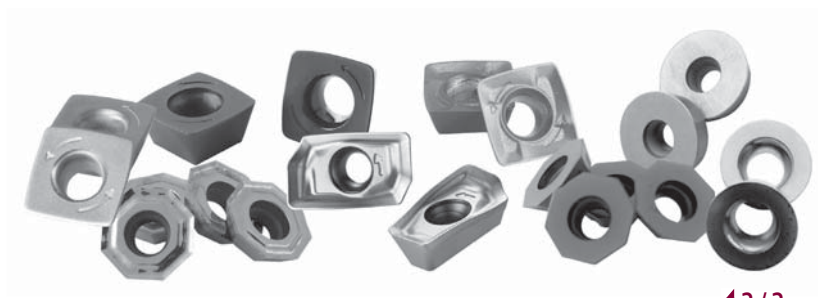
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BALL NOSE INDEXABLE INSERTS FOR UNIWORX®

r 4 | r 5 | r 6 | r 8 | r 10



Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw
r 10									
	20 835 V	ROHX 20XX	HSC 05	PVTi	20	5	10	M 5.0	
	20 836 V	ROHX 20XX	HSC 05	PVTiH	20	5	10	M 5.0	
	20 840 V	ROHX 20XX	P40	PVTi	20	5	10	M 5.0	



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steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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							98		
							98		
							98		

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

Service

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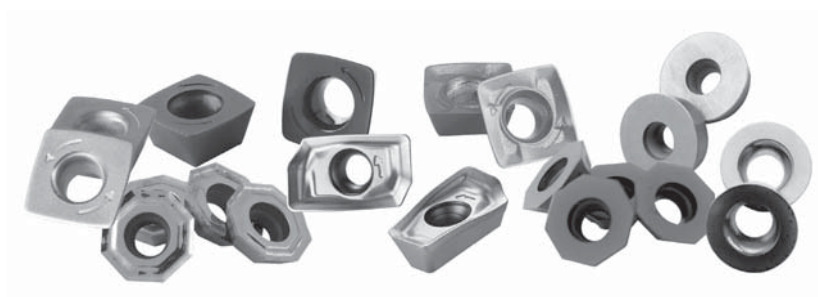
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INDEXABLE TORIC INSERTS FOR UNIWORX®

r 3 | r 4 | r 5 | r 7



Indexable inserts									
	catalogue no.	DIN Specification	Carbide Grade	Coating	d	s	r	Torx Screw	
r 3									
	08 093 V R3	ROHX 08T1	CBN for cast iron		8	2	3	M 3.0	
	08 835 V R3	ROHX 08T1	HSC 05	PVTi	8	2	3	M 3.0	
	08 836 V R3	ROHX 08T1	HSC 05	PVTiH	8	2	3	M 3.0	
r 4									
	10 093 V R4	ROHX 10T2	CBN for cast iron		10	2.75	4	M 3.5	
	10 835 V R4	ROHX 10T2	HSC 05	PVTi	10	2.75	4	M 3.5	
	10 836 V R4	ROHX 10T2	HSC 05	PVTiH	10	2.75	4	M 3.5	
r 5									
	12 093 V R5	ROHX 12XX	CBN for cast iron		12	3.3	5	M 4.0	
	12 835 V R5	ROHX 12XX	HSC 05	PVTi	12	3.3	5	M 4.0	
	12 836 V R5	ROHX 12XX	HSC 05	PVTiH	12	3.3	5	M 4.0	
r 7									
	16 093 V R7	ROHX 16T3	CBN for cast iron		16	4	7	M 5.0	
	16 835 V R7	ROHX 16T3	HSC 05	PVTi	16	4	7	M 5.0	
	16 836 V R7	ROHX 16T3	HSC 05	PVTiH	16	4	7	M 5.0	



steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	bodies on page	features
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						90	?
						90	
						90	

						92	?
						92	
						92	

						94	?
						94	
						94	

						96	?
						96	
						96	

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

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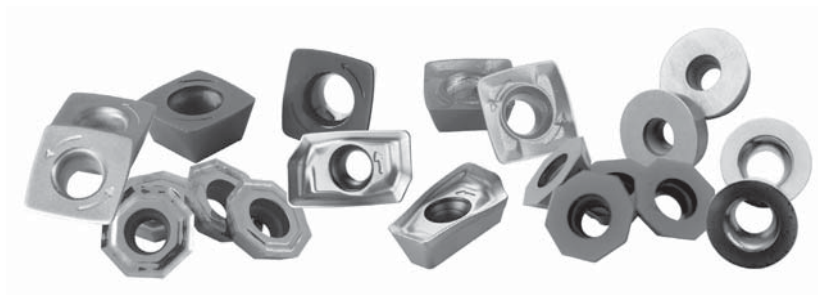
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SLOTWORX®-INDEXABLE INSERTS

size S

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw
Size S r 0.8									
		02 71 840 R08	XOMX 060208	P40	PVML	6.9	2.45	0.8	M 1.8



steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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							100	

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

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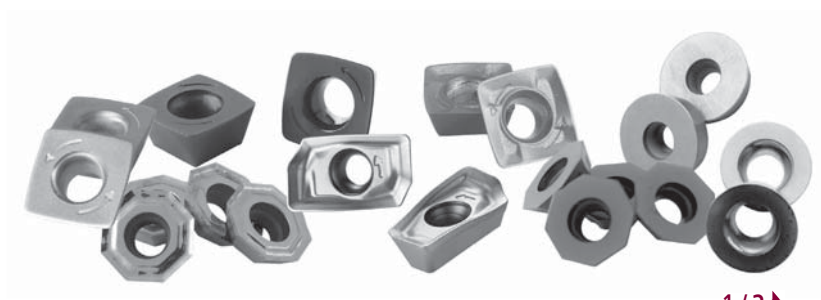


SLOTWORX®-INDEXABLE INSERTS

size M

Indexable inserts

	catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw	
Size M r 1									
	04 67 820	XDHT 10 T3 10	K10	polished	10	3.58	1	M 2.5	
	04 67 837	XDMT 10 T3 10	HSC 05	PVFN	10	3.58	1	M 2.5	
	04 67 844	XDHT 10 T3 10	P40	PVGO	10	3.58	1	M 2.5	
	04 67 848	XDMT 10 T3 10	P40	PVGO	10	3.58	1	M 2.5	
	04 67 860	XDHT 10 T3 10	K10	PVTi	10	3.58	1	M 2.5	
	04 67 860 D	XDHT 10 T3 10	K10	PVDiaN	10	3.58	1	M 2.5	
	04 67 896	XDMT 10 T3 10	M40	PVST	10	3.58	1	M 2.5	
size M r 2									
	04 67 820 R20	XDHT 10T320	K10	polished	10	3.58	2	M 2.5	
size M r 3									
	04 67 820 R30	XDHT 10T330	K10	polished	10	3.58	3	M 2.5	
size M r 4									
	04 67 820 R40	XDHT 10T340	K10	polished	10	3.58	4	M 2.5	



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steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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						102	✓ (NF) 🔥
	▽			▽		102	✓ NEW 🔥
	▽	▽	▽	▽		102	✓ NEW — 🔥
	▽	▽	▽	▽		102	✓ — 🔥
		▽			▽	102	✓ NEW — 🔥
					▽	102	✓ NEW — 🔥
	▽	▽	▽			102	✓ NEW — 🔥

NEW

					▽	102	✓ NEW (NF) 🔥

NEW

					▽	104	✓ NEW (NF) 🔥

NEW

					▽	104	✓ NEW (NF) 🔥

major application
minor application

▽ roughing
▽ roughing

▽ pre-finishing
▽ pre-finishing

▽ finishing
▽ finishing



SLOTWORX®-INDEXABLE INSERTS

size M

Indexable inserts

catalogue no.

DIN Specification

Carbide Grade

Coating

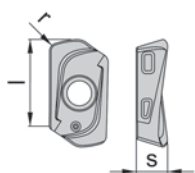
l

s

r

Torx Screw

size M | HF



04 67 848 HF

XDMT 10 T3 TR

P40

PVGO

10

3.58

1.4

M 2.5

04 67 862 HF

XDMT 10 T3 TR

K10

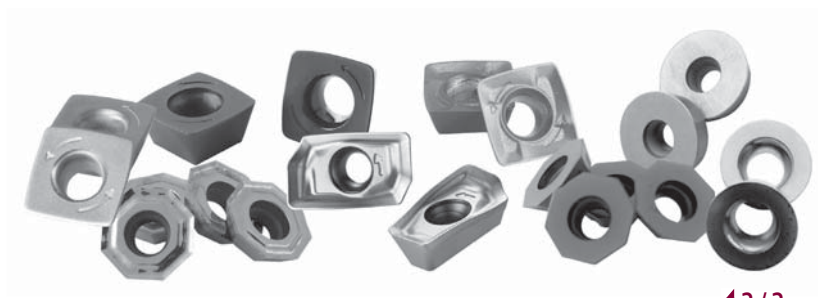
PVGP

10

3.58

1.4

M 2.5



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steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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NEW

						102	NEW
						102	NEW

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

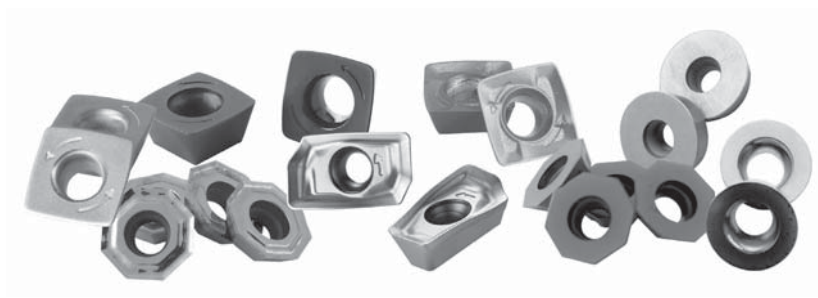
finishing
 finishing



SLOTWORX®-INDEXABLE INSERTS

size L

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw
size L r 1									
	05 68 848	XDMT 155210	P40	PVGO	15	5.2	1	M 3.5	
	05 68 896	XDMT 155210	M40	PVST	15	5.2	1	M 3.5	
size L r 3									
	05 68 820 R30	XDHT 155230	K10	polished	15	5.2	3	M 3.5	
size L r 4									
	05 68 820 R40	XDHT 155240	K10	polished	15	5.2	4	M 3.5	
size L r 5									
	05 68 820 R50	XDHT 155250	K10	polished	15	5.2	5	M 3.5	



steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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NEW

						106	NEW	
						106	NEW	

NEW

						106	NEW	

NEW

						108	NEW	

NEW

						108	NEW	

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

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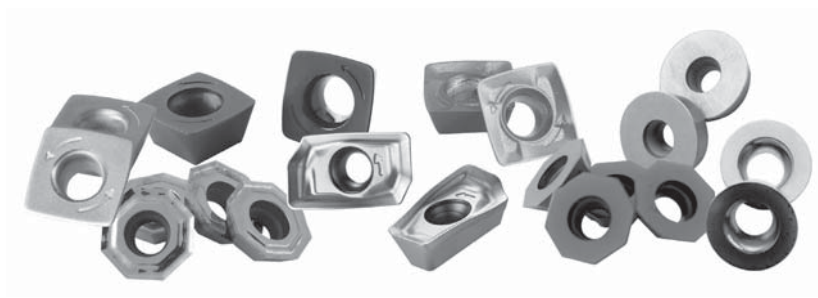
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RECTANGULAR INDEXABLE INSERTS

ADEW | LDLX | CDHT

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw
ADEW r 0.8									
	02 78 835	ADEW 0902 08TR	HSC 05	PVTi	9.52	2.38	0.8	M 2.5	
	02 78 850	ADEW 0902 08TR	P25	PVTi	9.52	2.38	0.8	M 2.5	
	02 78 860 D	ADEW 0902 08TR	K10	PVDiaN	9.52	2.38	0.8	M 2.5	
LDLX r 0.4									
	02 77 850	LDLX 06T2 04	P25	PVTi	8	2.8	0.4	M 2.5	
	02 77 860	LDLX 06T2 04	K10	PVTi	8	2.8	0.4	M 2.5	
	02 77 860 D	LDLX 06T2 04	K10	PVDiaN	8	2.8	0.4	M 2.5	
CBHT r 0.8									
	03 78 835	CDHT 0903 08	HSC 05	PVTi	9.3	2.98	0.8	M 2.5	
	03 78 840	CDHT 0903 08	P40	PVTi	9.3	2.98	0.8	M 2.5	
	03 78 850	CDHT 0903 08	P25	PVTi	9.3	2.98	0.8	M 2.5	



steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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							110	
							110	
							110	

							111	
							111	
							111	

							112	
							112	
							112	

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

Service

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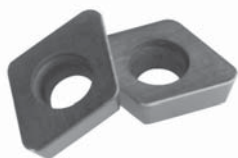
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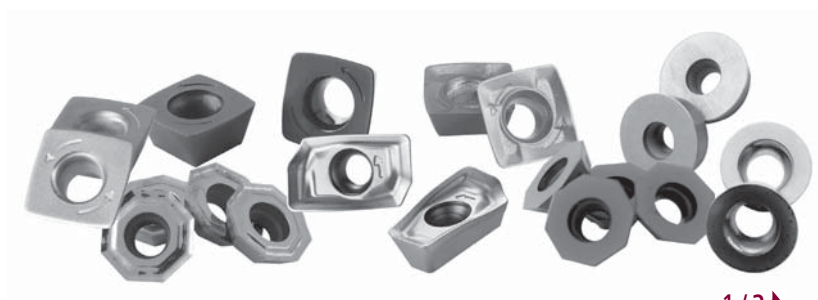


OCTAGONAL-, SQUARE- AND RHOMBIC INDEXABLE INSERTS

OFMW | SEEW | XDHW | XDHT

Indexable inserts

	catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw	
XDHW r 1									
	02 79 835	XDHW 0602 10	HSC 05	PVTi	6.5	2.38	1	M 2.5	
	02 79 892	XDHW 0602 10	CBN for steel		6.5	2.38	1	M 2.5	
	02 79 894	XDHW 0602 10	PCD		6.5	2.38	1	M 2.5	
XDHT r 1									
	02 79 831P	XDHT 0602 10	K10	polished	6.5	2.38	1	M 2.5	
	02 79 880	XDHT 0602 10	K10	PVTi	6.5	2.38	1	M 2.5	
	02 79 880 D	XDHW 0602 10	K10	PVDiaN	6.5	2.38	1	M 2.5	
XDHW r 2									
	02 79 835 R2	XDHW 0602 20	HSC 05	PVTi	6.5	2.38	2	M 2.5	
OFMW/OFET for Baseworx®									
	03 88 831P	OFET 05T3 05SN	K10	polished	-	3.77	-	M 4.0	
	03 88 840	OFMW 05T3 05SN	P40	PVTi	-	3.77	-	M 4.0	



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steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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						113	✓
						113	✓ NEW
						113	✓ NEW

						113	✓ NF
						113	✓ NF
						113	✓ NEW NF

						115	✓

						116	✓ NF
						116	✓

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

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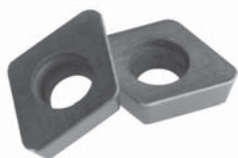
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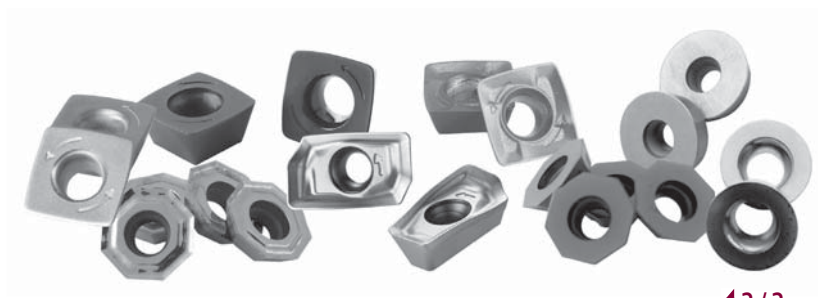
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OCTAGONAL-, SQUARE- AND RHOMBIC INDEXABLE INSERTS

OFMW | SEEW | XDHW | XDHT

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw
SEEW									
	03 09 850	SEEW 09 T3 AF	P25	PVTi	9.52	3.5	-	M 3.0	



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steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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							118	

major application
minor application

roughing
 roughing

pre-finishing
 pre-finishing

finishing
 finishing

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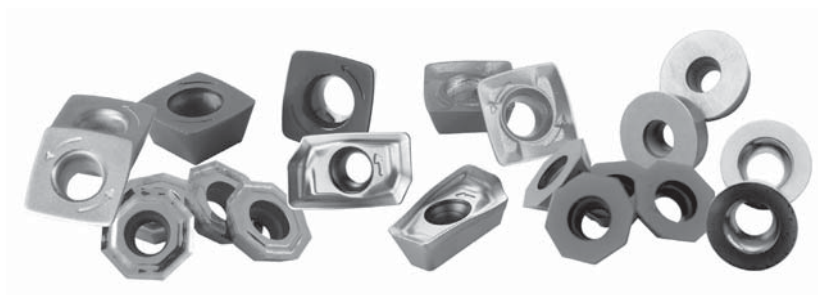


INDEXABLE V-INSERTS

r 1 | r 3

Indexable inserts

	catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw	
VDGT r 1									
	02 11 820	VDGT 11T2 10	K10	polished	9	2.78	1	M 2.5	
	02 11 860	VDGT 11T2 10	K10	PVTi	9	2.78	1	M 2.5	
	02 11 860 D	VDGT 11T2 10	K10	PVDiaN	9	2.78	1	M 2.5	
VCGT r 3									
	05 22 820	VCGT 2205 30	K10	polished	16	5.56	3	M 4.5	
	05 22 860	VCGT 2205 30	K10	PVTi	16	5.56	3	M 4.5	
	05 22 860 D	VCGT 2205 30	K10	PVDiaN	16	5.56	3	M 4.5	



steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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					▽	119	✓ (NF) 🔥
					▽	119	✓ (NF) 🔥
					▽	119	✓ (NF) 🔥

					▽	122	✓ (NF) 🔥
					▽	122	✓ (NF) 🔥
					▽	122	✓ (NF) 🔥

major application
minor application

▽ roughing
▽ roughing

▽ pre-finishing
▽ pre-finishing

▽ finishing
▽ finishing

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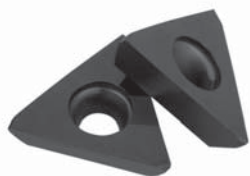
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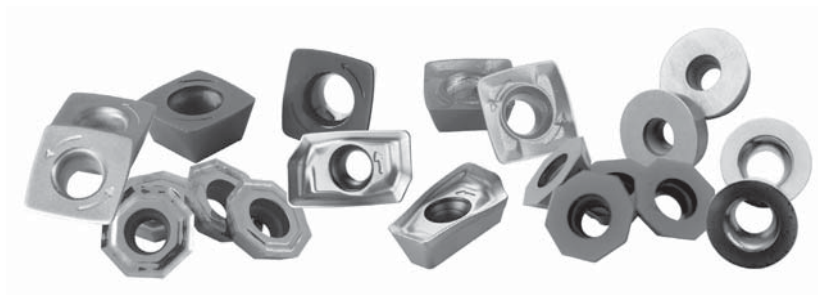
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TRIANGULAR INSERTS

TEHX for Mirroworx®

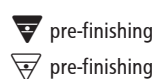
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TEHX									
	04 84 835	TEHX 16T3 ZF	HSC 05	PVTi	14.32	4	-	M 3.5	



steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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	▽	▽	▽	▽	▽	▽	124	✓

major application
minor application



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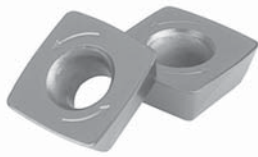
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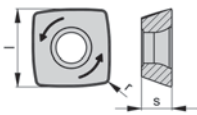
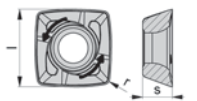
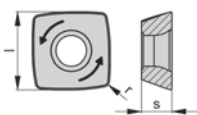
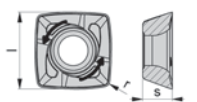
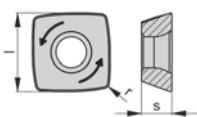
Operation Data

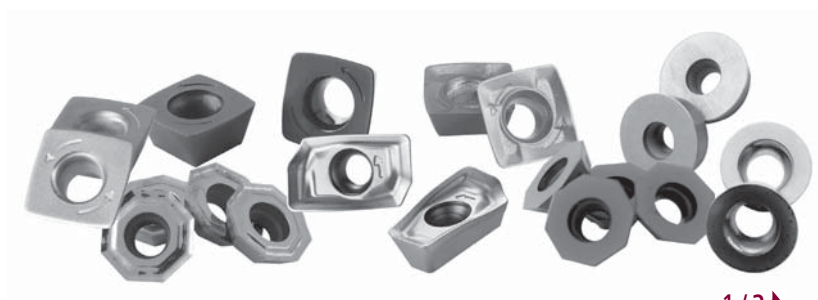
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QUADWORX®-SQUARE INDEXABLE INSERTS

Quadworx® size S | M | L



Indexable inserts									
catalogue no.		DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw	
size S									
	02 47 837	SDMX 07 02 05 SN	HSC 05	PVTi	7	2.38	0.5	M 2.5	
	02 47 842	SDMX 07 02 05 SN	P40	PVTi	7	2.38	0.5	M 2.5	
size S with concave moulding									
	02 47 896	SDMT 07 02 05 SN	M40	PVST	7	2.38	0.5	M 2.5	
size M									
	03 48 842	SDMX 09 T3 07 SN	P40	PVTi	9	3.5	0.7	M 3.0	
	03 48 846	SDMX 09 T3 07 SN	P40	PVGO	9	3.5	0.7	M 3.0	
	03 48 852	SDMX 09 T3 07 SN	P25	PVTi	9	3.5	0.7	M 3.0	
	03 48 860	SDHX 09 T3 07 SN	K10	PVTi	9	3.5	0.7	M 3.0	
size M with concave moulding									
	03 48 896	SDMT 09 T3 07 SN	M40	PVST	9	3.5	0.7	M 3.0	
size L									
	04 49 842	SDMX100510	P40	PVTi	10	5	1	M 4.0	
	04 49 846	SDMX100510	P40	PVGO	10	5	1	M 4.0	
	04 49 852	SDMX100510	P25	PVTi	10	5	1	M 4.0	
	04 49 860	SDHX100510	K10	PVTi	10	5	1	M 4.0	



1/2

steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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NEW

						126	✓ NEW
						126	✓ NEW

NEW

						126	✓ NEW

NEW

						128	✓ NEW
						128	✓ NEW
						128	✓ NEW
						128	✓ NEW

NEW

						128	✓ NEW

NEW

						130	✓ NEW
						130	✓ NEW
						130	✓ NEW
						130	✓ NEW

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

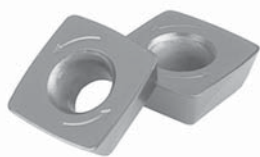
High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

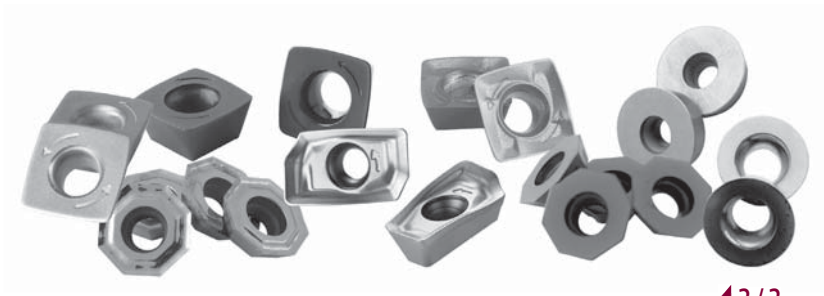
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QUADWORX®-SQUARE INDEXABLE INSERTS

Quadworx® size S | M | L

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw
size L with concave moulding									
		04 49 896	SDMT 100510	M40	PVST	10	5	1	M 4.0



2/2

steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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NEW

							130	   

major application
minor application

 roughing
 roughing

 pre-finishing
 pre-finishing

 finishing
 finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

Accessories

Customized
Products

Operation Data

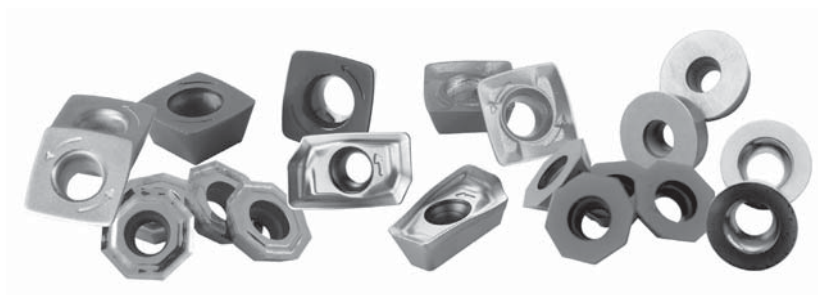
Index



TRIGAWORX®-TRIANGULAR INDEXABLE INSERTS

Trigaworx® size S | M | L

Indexable inserts		catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	Torx Screw
size S									
	02 72 835	WDHX 0702 05	HSC 05	PVTi	7	2.38	-	M 2.5	
	02 72 840	WDHX 0702 05	P40	PVTi	7	2.38	-	M 2.5	
size M									
	03 73 835	WDHX 1003 10	HSC 05	PVTi	10.3	3.4	-	M 3.0	
	03 73 840	WDHX 1003 10	P40	PVTi	10.3	3.4	-	M 3.0	
	03 73 850	WDHX 1003 10	P25	PVTi	10.3	3.4	-	M 3.0	
size L									
	04 74 840	WDHX 1404 20	P40	PVTi	14.3	4.76	-	M 4.5	



steel	high temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened materials	bodies on page	features
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	▽					132	✓
	▽					132	✓

	▽					134	✓
	▽					134	✓
	▽					134	✓

	▽					136	✓

major application
minor application

▽ roughing
▽ roughing

▽ pre-finishing
▽ pre-finishing

▽ finishing
▽ finishing

ULTRAPERFORM® SOLID CARBIDE END MILLS



A complete line of products, full of systematic advantages

Here is the best argument straight away for POKOLM-VOHA solid carbide end mills: we use our own end mills to produce a large proportion of our milling cutter bodies and arbors - and for good reason. Our own solid carbide end mills are famous for its precise concentricity, plus it is suitable for shrinking processes and have a full range of advantages in high-speed and extreme milling operations.

We use specially selected materials and have suppliers and coating partners, who are integrated in our developmental and production process. This creates the most favourable environment for our highly specialized staff to produce first class, high-quality end mills using the latest high-tech grinding machines. A wide variety of differentiated cutter geometries and corresponding coatings and a broad range of diameters and working lengths make up a comprehensive product range in order to handle almost any task you can think of.

The entire range of our UltraPerform solid carbide end mills is a part of our tool system and each one is precisely coordinated with all the other tools in our catalogue.

Right from the developmental stage, our tools are conceived and planned in detail together with our suppliers. We also maintain a close partnership and intensive collaboration with our raw materials suppliers and coating partners.

We understand the development of individual products as a process and thus, we guarantee high-quality final products. Furthermore, our solid carbide tools are created almost exclusively as a result of our close customer relations and are almost always developed out of individual solutions, that we devise into catalogue tools.

SOLID CARBIDE END MILLS

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SOLID CARBIDE END MILLS

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FGT SOLID CARBIDE END MILLS

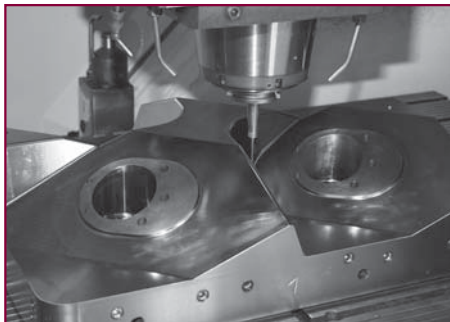
➔ FGT BALL NOSE & CORNER RADIUS END MILLS



Voha-Tosec's solid carbide- CBN (cubic boron nitride)- and PCD (polychristalline-diamond)- end mills are TOP-OF-THE-LINE-products, whose efficiency and life is the result of an excellent arrangement of substrate, tolerance, coating and cutting geometries.

Voha-Tosec's end mills are completely produced inhouse and specially tuned for different application areas, from diam. 0.4 up to 12 mm, with ball nose or corner radius, with reduced diameter- and radius-tolerances.

High precision shanks have a lot of influence on cutting edge grinding, thus Voha-Tosec is aiming to reach fit-class h 5.



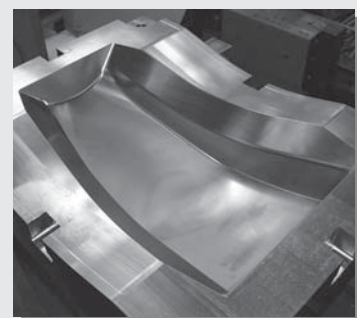
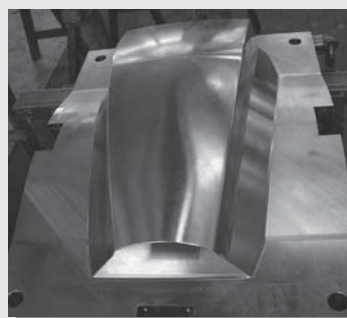
Radius tolerances of $5\mu\text{m}$ are essential, in order both of the cutting edges are operating uniformly continuous. This increases tool life and surface finish and reduces time- and cost-intensive retouching or redressing processes.

Together with our coating partner, we specially have developed the new PVTiH-coating with low friction coefficients, increased oxydization resistance and a hardness of 3600 HV. It is optimally suitable for machining cold work- and hot-forming tool steel with a hardness from 45 HRC up to 65 HRC and multiplies tool life.

OPERATION EXAMPLES FROM PRACTICE

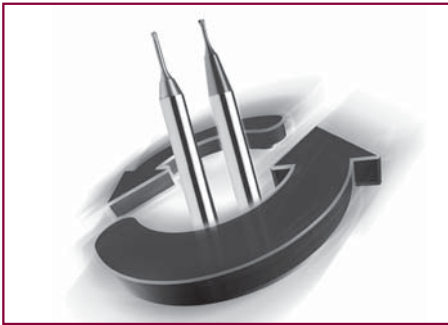
customers data: 3-D-milling of male and mould, finishing;
 Ball Nose End Mills FGT 1722 85 100
 material: 1.2312
 tool: 1722 85 100
 tool diam.: $\varnothing$ 10 mm
 a e (width of cut): 0,2
 a p (depth of cut): 0,2
 V f (feed/min): 1700 mm/min
 n: 8500 1/min

no wear land after 15 hours of machining
 component surface: clean and good



FGT AT SOLID CARBIDE END MILLS

⊕ FGT AT SOLID CARBIDE BALL NOSE- AND CORNER RADIUS END MILLS

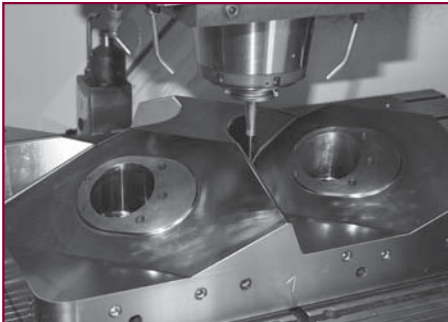


designed for economic efficient machining of rips and slots in narrow and depp profiles.

An up-to-date ultra-micro grain carbide and improved coating technologies guarantee extended durability and tool life, in particular in dry machining

The new neck-geometry avoids tool-vibrating, wenn machining deepest rips and profiles in components.

reduced diameter- and radius-tolerances plus new, adapted cutting edge geometries provide, together wit the above mentioned details:

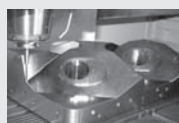


You benefit from following advantages:

- ⊕ reducing of vibrations
- ⊕ distict imporved tool life
- ⊕ better rigidity
- ⊕ increasing of usable operating length

OPERATION EXAMPLES FROM PRACTICE

customers data: profile milling of rips
finishing
material: 1.2744, hardend to 48 HRC
machine: Röders RP 800, HSK 50
catalogue no.: 1192 85 018
diam.: 1.8 mm/ 8 mm working depth
 a_e (width of cut): 0.1 mm
 a_p (depth of cut): 0.1 mm
 V_f (feed rate/min.): 3500 mm/min
 n : 30000 1/min
 V_c (cutting speed): 170 m/min
machining time: 20 hours
result: very efficient
surface: clean and good ($ra = 0.25$)
wear land: 0.02 mm



customers data: profile milling of rips
finsiing
material: 1.2343, hardened to 50-52 HRC
machine: Röders RP 800, HSK 50
catalogue no.: 1192 85 0102
diam. 1 mm / 10 mm working depth
 a_e : (width of cut): 0.03 mm
 a_p : (depth of cut): 0.03 mm
 V_f (feed rate/min.): 1000 mm/min
 n : 36000 1/min
 V_c (cutting speed): 113 m/min
machining time: 20 hours
result: very efficient
surface: clean and good ($ra = 0.25$)
wear land: 0.02 mm

GGT ROUGHING END MILLS FOR MACHINING GRAPHITE

➔ FOR EFFICIENT MACHINING OF GRAPHITE



Latest product for roughing of graphite are end mills with pyramidal teeth characteristics with diameters from 3 to 16 mm for big chip-volumes.

These end mills for machining graphite are coated with a newly developed diamond-coating. This guarantees longer tool life and an optimized chip removal, when roughing graphite electrodes with increased chip-volumes.



UGT SOLID CARBIDE END MILLS

⊕ UGT SHARP-CORNER- AND CORNER-RADIUS END MILLS FOR STAINLESS STEELS AND HEAT-RESISTANT ALLOYS



- ⊕ machining of stainless-, heat- and acid-resistant materials
- ⊕ machining of titanium- and nickel-based alloys
- ⊕ for minor applications, these end mills are suitable for machining hardened steels up to 58 HRC (only with adapted milling strategies)
- ⊕ slot milling up to $1,5 \times d1$
- ⊕ profile milling with utilization of the entire cutting length

You benefit from following advantages:

- ⊕ roughing and finishing with only one tool
- ⊕ outstanding surface-finish in finishing operations
- ⊕ the unequal division and the unequal helix angles allow vibration-free machining and extremely smooth running.
- ⊕ increased process-reliability and extended tool-life
- ⊕ efficient machining of difficult machinable materials
- ⊕ end mill diameters from 3 to 25 mm





BALL NOSE END MILLS FGT

2 fl. f. steel | w. wd. | high-precision | stand. + long

1192

2 flutes, plain shank, ball nose, centre cutting, right hand helix, PVTiH-coated

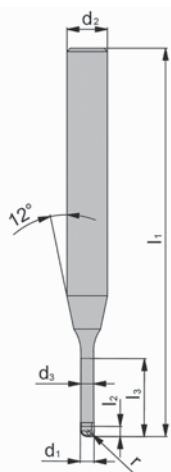
- new ultra micrograin-carbide
- modified coating
- optimized geometry
- with working depths up to 20 times d1
- high precision, $r=+/-0.005$ mm, $d1=-0.015$ mm

1/3 ▶

Material Classification	Material Classification							
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

Solid carbide end mills											
catalogue no.						ref. pg. arbors ref. application features					
	d_1	l_2	l_3	d_3	l_1	r	d_2	z			

w. wd. | high-precision



NV 1192 85 0041	0.4	0.4	1.5	0.385	50	0.2	4	2	352-355 A		WD HSM
NV 1192 85 0042	0.4	0.4	3	0.385	50	0.2	4	2	352-355 A		WD HSM
NV 1192 85 0043	0.4	0.4	5	0.385	50	0.2	4	2	352-355 A		WD HSM
NV 1192 85 0051	0.5	0.5	3	0.48	50	0.25	4	2	352-355 A		WD HSM
NV 1192 85 0052	0.5	0.5	5	0.48	50	0.25	4	2	352-355 A		WD HSM
NV 1192 85 0053	0.5	0.5	10	0.48	50	0.25	4	2	352-355 A		WD HSM
NV 1192 85 0061	0.6	0.6	3	0.58	50	0.3	4	2	352-355 A		WD HSM
NV 1192 85 0062	0.6	0.6	5	0.58	50	0.3	4	2	352-355 A		WD HSM
NV 1192 85 0063	0.6	0.6	10	0.58	50	0.3	4	2	352-355 A		WD HSM
NV 1192 85 0081	0.8	0.8	3	0.78	50	0.4	4	2	352-355 A		WD HSM
NV 1192 85 0082	0.8	0.8	5	0.78	50	0.4	4	2	352-355 A		WD HSM
NV 1192 85 0083	0.8	0.8	10	0.78	50	0.4	4	2	352-355 A		WD HSM
NV 1192 85 0084	0.8	0.8	15	0.78	50	0.4	4	2	352-355 A		WD HSM
NV 1192 85 0101	1	1	5	0.98	50	0.5	4	2	352-355 A		WD HSM
NV 1192 85 0102	1	1	10	0.98	50	0.5	4	2	352-355 A		WD HSM
NV 1192 85 0103	1	1	15	0.98	50	0.5	4	2	352-355 A		WD HSM
NV 1192 85 0104	1	1	20	0.98	75	0.5	4	2	352-355 A		WD HSM
NV 1192 85 0105	1	1	25	0.98	75	0.5	4	2	352-355 A		WD HSM
NV 1192 85 0151	1.5	1.5	5	1.45	50	0.75	4	2	352-355 A		WD HSM

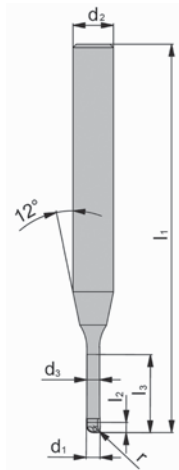
Solid carbide end mills

catalogue no.

 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application

features

w. wd. | high-precision



NV 1192 85 0152	1.5	1.5	10	1.45	50	0.75	4	2	352-355 A	✓ WD HSM
NV 1192 85 0153	1.5	1.5	15	1.45	50	0.75	4	2	352-355 A	✓ WD HSM
NV 1192 85 0154	1.5	1.5	20	1.45	75	0.75	4	2	352-355 A	✓ WD HSM
NV 1192 85 0155	1.5	1.5	25	1.45	75	0.75	4	2	352-355 A	✓ WD HSM
NV 1192 85 0156	1.5	1.5	30	1.45	75	0.75	4	2	352-355 A	✓ WD HSM
NV 1192 85 0201	2	2	5	1.95	50	1	4	2	352-355 A	✓ WD HSM
NV 1192 85 0202	2	2	10	1.95	50	1	4	2	352-355 A	✓ WD HSM
NV 1192 85 0203	2	2	15	1.95	50	1	4	2	352-355 A	✓ WD HSM
NV 1192 85 0204	2	2	20	1.95	75	1	4	2	352-355 A	✓ WD HSM
NV 1192 85 0205	2	2	30	1.95	75	1	4	2	352-355 A	✓ WD HSM
NV 1192 85 0206	2	2	40	1.95	75	1	4	2	352-355 A	✓ WD HSM
NV 1192 85 0302	3	3	10	2.95	57	1.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0303	3	3	15	2.95	57	1.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0304	3	3	20	2.95	75	1.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0305	3	3	25	2.95	75	1.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0306	3	3	30	2.95	75	1.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0307	3	3	40	2.95	75	1.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0402	4	4	10	3.9	57	2	6	2	356-360 A	✓ WD HSM
NV 1192 85 0403	4	4	15	3.9	57	2	6	2	356-360 A	✓ WD HSM
NV 1192 85 0404	4	4	20	3.9	75	2	6	2	356-360 A	✓ WD HSM
NV 1192 85 0405	4	4	25	3.9	75	2	6	2	356-360 A	✓ WD HSM
NV 1192 85 0406	4	4	30	3.9	75	2	6	2	356-360 A	✓ WD HSM
NV 1192 85 0407	4	4	40	3.9	75	2	6	2	356-360 A	✓ WD HSM
NV 1192 85 0502	5	5	10	4.9	57	2.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0503	5	5	15	4.9	57	2.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0504	5	5	20	4.9	75	2.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0505	5	5	25	4.9	75	2.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0506	5	5	30	4.9	75	2.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0507	5	5	40	4.9	75	2.5	6	2	356-360 A	✓ WD HSM
NV 1192 85 0602	6	6	10	5.85	57	3	6	2	356-360 A	✓ WD HSM

major application
minor application
 roughing
 roughing

 pre-finishing
 pre-finishing

 finishing
 finishing

2 fl. f. steel | w. wd. | high-precision | stand. + long

- high precision, $r = \pm 0.005$ mm, $d_1 = -0.015$ mm

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

ref. pg. arbors
ref. application
features

A schematic diagram of a tapered rod. The rod has a total length l_1 and a top diameter d_2 . It tapers to a diameter d_3 at a distance l_2 from the top. Below this, there is a section of length l_3 that tapers further to a bottom diameter d_1 . A 12-degree angle is indicated for the taper from d_2 to d_3 . A small section of length l_4 is shown at the very bottom, also tapering to d_1 .

[illegible]

BALL NOSE END MILLS FGT

2 fl. f. steel | no wd. | high-precision | stand. + long

1722

flutes, plain shank, ball nose, centre cutting, right hand helix, PVTiH-coated

- new ultra micrograin-carbide
- modified coating, optimized geometry
- high precision, $r=+-0.005$ mm, $d1=-0.015$ mm
- without working depth



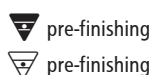
1/2 ▶

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

Solid carbide end mills	catalogue no.	d_1	l_2	l_3	d_3	l_1	r	d_2	z	ref. pg. arbors	ref. application	features
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no wd. high-precision												
	NW 1722 85 004	0.4	0.4	-	-	50	0.2	4	2	352-355 A		
	NW 1722 85 005	0.5	0.5	-	-	50	0.25	4	2	352-355 A		
	NW 1722 85 006	0.6	0.6	-	-	50	0.3	4	2	352-355 A		
	NW 1722 85 008	0.8	0.8	-	-	50	0.4	4	2	352-355 A		
	NW 1722 85 010	1	1	-	-	50	0.5	4	2	352-355 A		
	NW 1722 85 0101	1	1	-	-	75	0.5	4	2	352-355 A		
	NW 1722 85 015	1.5	1.5	-	-	50	0.75	4	2	352-355 A		
	NW 1722 85 0151	1.5	1.5	-	-	75	0.75	4	2	352-355 A		
	NW 1722 85 020	2	2	-	-	50	1	4	2	352-355 A		
	NW 1722 85 0201	2	2	-	-	75	1	4	2	352-355 A		
	NW 1722 85 030	3	3	-	-	57	1.5	6	2	356-360 A		
	NW 1722 85 0301	3	3	-	-	75	1.5	6	2	356-360 A		
	NW 1722 85 040	4	4	-	-	57	2	6	2	356-360 A		
	NW 1722 85 0401	4	4	-	-	75	2	6	2	356-360 A		
	NW 1722 85 050	5	5	-	-	57	2.5	6	2	356-360 A		
	NW 1722 85 0501	5	5	-	-	75	2.5	6	2	356-360 A		
	NW 1722 85 060	6	6	-	-	57	3	6	2	356-360 A		
	NW 1722 85 0601	6	6	-	-	75	3	6	2	356-360 A		
	NW 1722 85 080	8	8	-	-	63	4	8	2	361-365 A		

major application
minor application





BALL NOSE END MILLS FGT

2 fl. f. steel | no wd. | high-precision | stand. + long

1722

flutes, plain shank, ball nose, centre cutting, right hand helix, PVTiH-coated

- new ultra micrograin-carbide
- modified coating, optimized geometry
- high precision, $r=\pm 0.005$ mm, $d1=\pm 0.015$ mm
- without working depth

2/2

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r	d_2	z					

no wd. high-precision													
	NW 1722 85 0801	8	8	-	-	90	4	8	2	361-365 A			
	NW 1722 85 100	10	10	-	-	72	5	10	2	366-370 A			
	NW 1722 85 1001	10	10	-	-	100	5	10	2	366-370 A			
	NW 1722 85 120	12	12	-	-	83	6	12	2	371-374 A			
	NW 1722 85 1201	12	12	-	-	110	6	12	2	371-374 A			
	NW 1722 85 160	16	16	-	-	92	8	16	2	375-378 A			
	NW 1722 85 1601	16	16	-	-	150	8	16	2	375-378 A			

BALL NOSE END MILLS FGT

2 flutes f. copper, graphite, non-ferr. mat. + titan

1462 49

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix

PVDiaG coated

- standard and long series
- with working depths
- modified diamond-coating

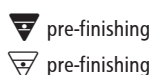


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaG

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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w. wd. standard series												
	NV 1462 49 0031	0.3	0.3	1	0.285	50	0.15	4	2	352-355 A		WD NF HSM
	NV 1462 49 0041	0.4	0.4	1	0.385	50	0.2	4	2	352-355 A		WD NF HSM
	NV 1462 49 0051	0.5	0.5	2	0.48	50	0.25	4	2	352-355 A		WD NF HSM
	NV 1462 49 0061	0.6	0.6	2	0.58	50	0.3	4	2	352-355 A		WD NF HSM
	NV 1462 49 0081	0.8	0.8	4	0.78	50	0.4	4	2	352-355 A		WD NF HSM
	NV 1462 49 011	1	1	5	0.98	50	0.5	4	2	352-355 A		WD NF HSM
	NV 1462 49 0151	1.5	1.5	10	1.45	50	0.75	4	2	352-355 A		WD NF HSM
	NV 1462 49 021	2	2	10	1.95	50	1	4	2	352-355 A		WD NF HSM
	NV 1462 49 031	3	3	10	2.95	57	1.5	6	2	356-360 A		WD NF HSM
	NV 1462 49 0411	4	4	15	3.9	57	2	6	2	356-360 A		WD NF HSM
	NV 1462 49 0511	5	5	20	4.9	57	2.5	6	2	356-360 A		WD NF HSM
	NV 1462 49 0611	6	6	20	5.85	57	3	6	2	356-360 A		WD NF HSM
	NV 1462 49 0614	6	6	40	5.85	75	3	6	2	356-360 A		NEW WD NF HSM
	NV 1462 49 0811	8	8	20	7.85	63	4	8	2	361-365 A		WD NF HSM
	NV 1462 49 1001	10	10	20	9.85	72	5	10	2	366-370 A		WD NF HSM

major application
minor application





BALL NOSE END MILLS

2 flutes for steel | Mini | no. wd.

1142

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- 3 mm shank-diam.
- standard series
- without working depth

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills															
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg.	arbors	ref. application	features

Mini no wd. standard series														
	NW 1142 56 001	0.1	0.2	-	-	39	0.05	3	2	350-351 A				
	NW 1142 56 0015	0.15	0.3	-	-	39	0.075	3	2	350-351 A				
	NW 1142 56 002	0.2	0.5	-	-	39	0.1	3	2	350-351 A				
	NW 1142 56 003	0.3	1	-	-	39	0.15	3	2	350-351 A				
	NW 1142 56 004	0.4	1	-	-	39	0.2	3	2	350-351 A				
	NW 1142 56 005	0.5	1.5	-	-	39	0.25	3	2	350-351 A				
	NW 1142 56 006	0.6	1.5	-	-	39	0.3	3	2	350-351 A				
	NW 1142 56 007	0.7	2	-	-	39	0.35	3	2	350-351 A				
	NW 1142 56 008	0.8	2	-	-	39	0.4	3	2	350-351 A				
	NW 1142 56 010	1	3	-	-	39	0.5	3	2	350-351 A				
	NW 1142 56 011	1.1	3	-	-	39	0.55	3	2	350-351 A				
	NW 1142 56 012	1.2	3	-	-	39	0.6	3	2	350-351 A				
	NW 1142 56 014	1.4	4	-	-	39	0.7	3	2	350-351 A				
	NW 1142 56 015	1.5	4	-	-	39	0.75	3	2	350-351 A				
	NW 1142 56 016	1.6	5	-	-	39	0.8	3	2	350-351 A				
	NW 1142 56 018	1.8	5	-	-	39	0.9	3	2	350-351 A				
	NW 1142 56 020	2	5	-	-	39	1	3	2	350-351 A				
	NW 1142 56 025	2.5	7	-	-	39	1.25	3	2	350-351 A				

BALL NOSE END MILLS

2 flutes for steel | no wd. | stand. series

1222

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- without working depth



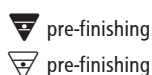
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Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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no wd. standard series												
	NW 1222 56 0041	0.4	0.6	-	-	50	0.2	4	2	352-355 A		
	NW 1222 56 0051	0.5	0.8	-	-	50	0.25	4	2	352-355 A		
	NW 1222 56 0061	0.6	0.9	-	-	50	0.3	4	2	352-355 A		
	NW 1222 56 0071	0.7	1.1	-	-	50	0.35	4	2	352-355 A		
	NW 1222 56 0081	0.8	1.2	-	-	50	0.4	4	2	352-355 A		
	NW 1222 56 011	1	1.5	-	-	50	0.5	4	2	352-355 A		
	NW 1222 56 0101	1	1.5	-	-	57	0.5	6	2	356-360 A		
	NW 1222 56 0121	1.2	1.8	-	-	50	0.6	4	2	352-355 A		
	NW 1222 56 0141	1.4	2	-	-	50	0.7	4	2	352-355 A		
	NW 1222 56 0152	1.5	2.2	-	-	50	0.75	4	2	352-355 A		
	NW 1222 56 0151	1.5	2.2	-	-	57	0.75	6	2	356-360 A		
	NW 1222 56 0161	1.6	2.4	-	-	50	0.8	4	2	352-355 A		
	NW 1222 56 0181	1.8	2.7	-	-	50	0.9	4	2	352-355 A		
	NW 1222 56 0201	2	3	-	-	50	1	4	2	352-355 A		
	NW 1222 56 021	2	3	-	-	57	1	6	2	356-360 A		
	NW 1222 56 0252	2.5	4	-	-	50	1.25	4	2	352-355 A		
	NW 1222 56 025	2.5	4	-	-	57	1.25	6	2	356-360 A		
	NW 1222 56 0301	3	4.5	-	-	50	1.5	4	2	352-355 A		
	NW 1222 56 030	3	4.5	-	-	57	1.5	6	2	356-360 A		

major application
minor application





BALL NOSE END MILLS

2 flutes for steel | no wd. | stand. series

1222

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- without working depth

2/2

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.										ref. pg. arbors	
				d_1	l_2	l_3	d_3	l_1	r	d_2	z
										ref. application	
										features	

no wd. standard series											
	NW 1222 56 0401	4	6	-	-	50	2	4	2	352-355 A	
	NW 1222 56 040	4	6	-	-	57	2	6	2	356-360 A	
	NW 1222 56 050	5	7.5	-	-	57	2.5	6	2	356-360 A	
	NW 1222 56 060	6	9	-	-	57	3	6	2	356-360 A	
	NW 1222 56 070	7	10.5	-	-	63	3.5	8	2	361-365 A	
	NW 1222 56 080	8	12	-	-	63	4	8	2	361-365 A	
	NW 1222 56 090	9	13	-	-	72	4.5	10	2	366-370 A	
	NW 1222 56 100	10	15	-	-	72	5	10	2	366-370 A	
	NW 1222 56 120	12	18	-	-	83	6	12	2	371-374 A	
	NW 1222 56 140	14	21	-	-	83	7	14	2	A	
	NW 1222 56 160	16	24	-	-	92	8	16	2	375-378 A	
	NW 1222 56 180	18	27	-	-	92	9	18	2	A	
	NW 1222 56 200	20	30	-	-	104	10	20	2	379-381 A	

BALL NOSE END MILLS

2 flutes for steel | no wd. | long series

1232

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- long series
- without working depth

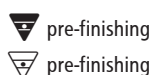


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

no wd. long series													
	NW 1232 56 010	1	1.5	-	-	75	0.5	6	2	356-360 A			HSM
	NW 1232 56 015	1.5	2.3	-	-	75	0.75	6	2	356-360 A			HSM
	NW 1232 56 020	2	3	-	-	75	1	6	2	356-360 A			HSM
	NW 1232 56 025	2.5	4	-	-	75	1.25	6	2	356-360 A			HSM
	NW 1232 56 030	3	4.5	-	-	75	1.5	6	2	356-360 A			HSM
	NW 1232 56 040	4	6	-	-	75	2	6	2	356-360 A			HSM
	NW 1232 56 050	5	7.5	-	-	75	2.5	6	2	356-360 A			HSM
	NW 1232 56 055	5.5	8.5	-	-	75	2.75	6	2	356-360 A			HSM
	NW 1232 56 060	6	9	-	-	75	3	6	2	356-360 A			HSM
	NW 1232 56 070	7	10.5	-	-	90	3.5	8	2	361-365 A			HSM
	NW 1232 56 080	8	12	-	-	90	4	8	2	361-365 A			HSM
	NW 1232 56 100	10	15	-	-	100	5	10	2	366-370 A			HSM
	NW 1232 56 120	12	18	-	-	110	6	12	2	371-374 A			HSM
	NW 1232 56 160	16	24	-	-	140	8	16	2	375-378 A			HSM
	NW 1232 56 200	20	30	-	-	150	10	20	2	379-381 A			HSM

major application
minor application





BALL NOSE END MILLS

2 flutes for steel | w. wd. | long series

1322

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- with working depth

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.						ref. pg. arbors ref. application features					
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z			

w. wd. standard series											
	NW 1322 56 020	2	3	10	1.9	75	1	6	2	356-360 A	
	NW 1322 56 030	3	4.5	12	2.9	75	1.5	6	2	356-360 A	
	NW 1322 56 040	4	6	12	3.8	75	2	6	2	356-360 A	
	NW 1322 56 050	5	7.5	15	4.8	75	2.5	6	2	356-360 A	
	NW 1322 56 060	6	9	20	5.8	75	3	6	2	356-360 A	
	NW 1322 56 080	8	12	26	7.8	90	4	8	2	361-365 A	
	NW 1322 56 100	10	15	31	9.8	100	5	10	2	366-370 A	
	NW 1322 56 120	12	18	37	11.8	110	6	12	2	371-374 A	
	NW 1322 56 160	16	24	43	15.8	140	8	16	2	375-378 A	

BALL NOSE END MILLS

2 flutes f. steel | reinforced shank | tapered wd.

1162

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

• long series

• l3: maximum working depth; 1.5° draft angle behind cutting edge



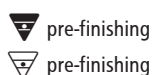
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Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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reinforced shank tapered WD												
	NW 1162 56 0041	0.4	0.6	25	-	75	0.2	6	2	356-360 A		
	NW 1162 56 010	1	1.5	25	-	75	0.5	6	2	356-360 A		
	NW 1162 56 0101	1	1.5	39	-	75	0.5	6	2	356-360 A		
	NW 1162 56 015	1.5	2.3	25	-	75	0.75	6	2	356-360 A		
	NW 1162 56 020	2	3	25	-	75	1	6	2	356-360 A		
	NW 1162 56 021	2	3	50	-	100	1	6	2	356-360 A		
	NW 1162 56 025	2.5	4	25	-	75	1.25	6	2	356-360 A		
	NW 1162 56 030	3	4.5	25	-	75	1.5	6	2	356-360 A		
	SW 1162 56 034	3	4.5	39	-	75	1.5	6	2	356-360 A		
	NW 1162 56 031	3	4.5	50	-	100	1.5	6	2	356-360 A		
	NW 1162 56 040	4	6	25	-	75	2	6	2	356-360 A		
	NW 1162 56 0401	4	6	39	-	75	2	6	2	356-360 A		
	NW 1162 56 041	4	6	44	-	100	2	6	2	356-360 A		
	NW 1162 56 050	5	7.5	25	-	75	2.5	6	2	356-360 A		
	NW 1162 56 051	5	7.5	50	-	90	2.5	8	2	361-365 A		
	NW 1162 56 060	6	9	35	-	75	3	8	2	361-365 A		
	NW 1162 56 061	6	9	50	-	100	3	10	2	366-370 A		
	NW 1162 56 080	8	12	50	-	100	4	10	2	366-370 A		
	NW 1162 56 081	8	12	90	-	150	4	12	2	371-374 A		

major application
minor application





BALL NOSE END MILLS

2 flutes f. steel | reinforced shank | tapered wd.

1162

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

• long series

• l3: maximum working depth; 1.5° draft angle behind cutting edge

2/2

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.						ref. pg. arbors ref. application features					
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z			

reinforced shank tapered WD											
	NW 1162 56 100	10	15	50	-	110	5	12	2	371-374 A	
	NW 1162 56 101	10	15	50	-	150	5	12	2	371-374 A	
	NW 1162 56 121	12	18	90	-	150	6	16	2	375-378 A	

BALL NOSE END MILLS

2 flutes for steel | extra long series

1132

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi coated

- extra long series

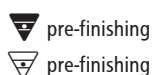


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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extra long series												
	NW 1132 56 030	3	30	-	-	60	1.5	3	2	350-351 A		
	NW 1132 56 031	3	30	-	-	75	1.5	3	2	350-351 A		
	NW 1132 56 040	4	30	-	-	60	2	4	2	352-355 A		
	NW 1132 56 041	4	30	-	-	75	2	4	2	352-355 A		
	NW 1132 56 050	5	35	-	-	70	2.5	5	2	385 A		
	NW 1132 56 051	5	40	-	-	100	2.5	5	2	385 A		
	NW 1132 56 060	6	40	-	-	100	3	6	2	356-360 A		
	NW 1132 56 061	6	50	-	-	150	3	6	2	356-360 A		
	NW 1132 56 080	8	40	-	-	100	4	8	2	361-365 A		
	NW 1132 56 081	8	50	-	-	150	4	8	2	361-365 A		
	NW 1132 56 100	10	45	-	-	100	5	10	2	366-370 A		
	NW 1132 56 101	10	60	-	-	150	5	10	2	366-370 A		
	NW 1132 56 120	12	45	-	-	100	6	12	2	371-374 A		
	NW 1132 56 121	12	75	-	-	150	6	12	2	371-374 A		
	NW 1132 56 160	16	45	-	-	100	8	16	2	375-378 A		
	NW 1132 56 161	16	75	-	-	150	8	16	2	375-378 A		
	NW 1132 46 200	20	50	-	-	100	10	20	2	379-381 A		
	NW 1132 56 200	20	55	-	-	125	10	20	2	379-381 A		
	NW 1132 56 201	20	75	-	-	150	10	20	2	379-381 A		

major application
minor application





BALL NOSE END MILLS

2 flutes f. hardened steel | no wd. | stand. series

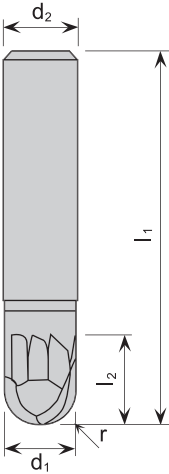
1312

2 flutes, plain shank, ball nose, centre cutting, 15° right hand helix, PVAT-coated

- standard series
- extremely stable core diameter
- new ultramicrograin carbide
- newly developed coating
- optimized geometry

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVAT

Solid carbide end mills														
catalogue no.				d_1	l_2	l_3	d_3	l_1	r	d_2	z	ref. pg. arbors	ref. application	features

no wd. standard series											
	NW 1312 59 011	1	1	-	-	57	0.5	6	2	356-360 A	
	NW 1312 59 016	1.5	1.5	-	-	57	0.75	6	2	356-360 A	
	NW 1312 59 021	2	2	-	-	57	1	6	2	356-360 A	
	NW 1312 59 031	3	3	-	-	57	1.5	6	2	356-360 A	
	NW 1312 59 041	4	4	-	-	57	2	6	2	356-360 A	
	NW 1312 59 051	5	5	-	-	57	2.5	6	2	356-360 A	
	NW 1312 59 061	6	6	-	-	57	3	6	2	356-360 A	
	NW 1312 59 081	8	8	-	-	63	4	8	2	361-365 A	
	NW 1312 59 101	10	10	-	-	72	5	10	2	366-370 A	
	NW 1312 59 121	12	12	-	-	83	6	12	2	371-374 A	

BALL NOSE END MILLS

2 flutes for hardened steel | w. wd. | long series

1313

2 flutes, plain shank, ball nose, centre cutting, 15° right hand helix, PVAT-coated

- long series
- extremely stable core diameter
- new ultramicrograin carbide
- newly developed coating
- optimized geometry

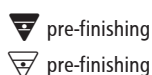


Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVAT

Solid carbide end mills											
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z
				ref. pg. arbors ref. application features							

w. wd. long series											
	NW 1313 59 011	1	1	6	0.95	75	0.5	6	2	356-360 A	
	NW 1313 59 016	1.5	1.5	8	1.4	75	0.75	6	2	356-360 A	
	NW 1313 59 021	2	2	10	1.9	75	1	6	2	356-360 A	
	NW 1313 59 031	3	3	12	2.9	75	1.5	6	2	356-360 A	
	NW 1313 59 041	4	4	15	3.8	75	2	6	2	356-360 A	
	NW 1313 59 051	5	5	18	4.8	75	2.5	6	2	356-360 A	
	NW 1313 59 061	6	6	20	5.8	75	3	6	2	356-360 A	
	NW 1313 59 081	8	8	26	7.8	90	4	8	2	361-365 A	
	NW 1313 59 101	10	10	31	9.8	100	5	10	2	366-370 A	
	NW 1313 59 121	12	12	37	11.8	110	6	12	2	371-374 A	

major application
minor application





BALL NOSE END MILLS

2 flutes for steel | spherical | w. wd.

1342

PVTi coated

- for plunging and lifting an 90° walls
- with working depths

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

spherical | w. wd.

NW 1342 56 020	2	3	8	1.9	75	1	6	2	356-360 A	☒ WD HSM
NW 1342 56 030	3	4	12	2.9	75	1.5	6	2	356-360 A	☒ WD HSM
NW 1342 56 040	4	5	16	3.8	75	2	6	2	356-360 A	☒ WD HSM
NW 1342 56 050	5	6	20	4.8	100	2.5	6	2	356-360 A	☒ WD HSM
NW 1342 56 060	6	7	24	5.8	100	3	6	2	356-360 A	☒ WD HSM
NW 1342 56 080	8	9	32	7.8	100	4	8	2	361-365 A	☒ WD HSM
NW 1342 56 100	10	11	40	9.8	125	5	10	2	366-370 A	☒ WD HSM
NW 1342 56 120	12	13	40	11.8	125	6	12	2	371-374 A	☒ WD HSM

BALL NOSE END MILLS

1 + 2 flutes f. hardened steel | CBN | spherical | w. wd.

1600

1 + 2 flutes, plain shank, ball nose, centre cutting

• with working depth

• for hardened steel over 60 HRC

• **Attention:**

Please use these end mills only with approach angle of high-speed spindle!

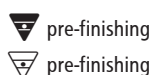


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							CBN	

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

CBN spherical w. wd.													
	NW 1600 10 015	1.5	-	6	1.4	50	0.75	6	1	356-360 A		WD	HSM
	NW 1600 10 020	2	-	8	1.9	50	1	6	1	356-360 A		WD	HSM
	NW 1600 10 030	3	-	12	2.9	50	1.5	6	1	356-360 A		WD	HSM
	NW 1600 10 040	4	-	15	3.8	50	2	6	2	356-360 A		WD	HSM
	NW 1600 10 050	5	-	20	4.8	75	2.5	6	2	356-360 A		WD	HSM
	NW 1600 10 060	6	-	20	5.8	75	3	6	2	356-360 A		WD	HSM
	NW 1600 10 080	8	-	35	7.8	100	4	8	2	361-365 A		WD	HSM
	NW 1600 10 100	10	-	35	9.8	100	5	10	2	366-370 A		WD	HSM
	NW 1600 10 120	12	-	50	-	100	6	10	2	366-370 A		WD	HSM

major application
minor application





BALL NOSE END MILLS

4 flutes for steel | no wd. | stand. series

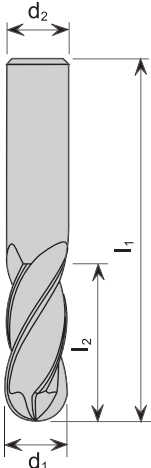
1224

4 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- without working depth

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features

no wd. standard series											
	NW 1224 56 020	2	3	-	-	57	1	6	4	356-360 A	
	NW 1224 56 030	3	4.5	-	-	57	1.5	6	4	356-360 A	
	NW 1224 56 0301	3	6	-	-	57	1.5	6	4	356-360 A	
	NW 1224 56 040	4	6	-	-	57	2	6	4	356-360 A	
	NW 1224 56 050	5	7.5	-	-	57	2.5	6	4	356-360 A	
	NW 1224 56 060	6	9	-	-	57	3	6	4	356-360 A	
	NW 1224 56 0601	6	12	-	-	57	3	6	4	356-360 A	
	NW 1224 56 080	8	12	-	-	63	4	8	4	361-365 A	
	NW 1224 56 090	9	13.5	-	-	72	4.5	10	4	366-370 A	 
	NW 1224 56 100	10	15	-	-	72	5	10	4	366-370 A	
	NW 1224 56 1001	10	20	-	-	72	5	10	4	366-370 A	
	NW 1224 56 120	12	18	-	-	83	6	12	4	371-374 A	
	NW 1224 56 1201	12	24	-	-	83	6	12	4	371-374 A	
	NW 1224 56 140	14	21	-	-	83	7	14	4	A	 
	NW 1224 56 160	16	24	-	-	92	8	16	4	375-378 A	
	NW 1224 56 200	20	30	-	-	104	10	20	4	379-381 A	

BALL NOSE END MILLS

4 flutes for steel | w. wd. | long series

1324

4 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- long series
- with working depth

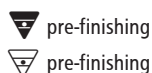


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

w. wd. long series													
	NW 1324 56 020	2	3	10	1.9	75	1	6	4	356-360 A			
	NW 1324 56 030	3	4.5	12	2.9	75	1.5	6	4	356-360 A			
	NW 1324 56 040	4	6	12	3.8	75	2	6	4	356-360 A			
	NW 1324 56 050	5	7.5	15	4.8	75	2.5	6	4	356-360 A			
	NW 1324 56 060	6	9	20	5.8	75	3	6	4	356-360 A			
	NW 1324 56 061	6	9	20	5.8	100	3	6	4	356-360 A			
	NW 1324 56 080	8	12	26	7.8	90	4	8	4	361-365 A			
	NW 1324 56 100	10	15	31	9.8	100	5	10	4	366-370 A			
	NW 1324 56 120	12	18	37	11.8	110	6	12	4	371-374 A			
	NW 1324 56 160	16	24	43	15.8	110	8	16	4	375-378 A			
	NW 1324 56 200	20	30	53	19.8	150	10	20	4	379-381 A			

major application
minor application





BALL NOSE END MILLS

4 flutes f. steel | reinforced shank | tapered wd.

1164

4 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- long series
- l3: maximum working depth; 1.5° draft angle behind cutting edge

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors ref. application		features

reinforced shank tapered WD														
	NW 1164 56 030	3	4.5	25	-	75	1.5	6	4	356-360 A		WD		
	NW 1164 56 031	3	4.5	50	-	100	1.5	6	4	356-360 A		WD		
	NW 1164 56 040	4	6	25	-	75	2	6	4	356-360 A		WD		
	NW 1164 56 041	4	6	50	-	100	2	6	4	356-360 A		WD		
	NW 1164 56 050	5	7.5	25	-	75	2.5	6	4	356-360 A		WD		
	NW 1164 56 051	5	7.5	50	-	90	2.5	8	4	361-365 A		WD		
	NW 1164 56 060	6	9	35	-	75	3	8	4	361-365 A		WD		
	NW 1164 56 061	6	9	50	-	100	3	10	4	366-370 A		WD		
	NW 1164 56 080	8	12	50	-	100	4	10	4	366-370 A		WD		
	NW 1164 56 081	8	12	90	-	150	4	12	4	371-374 A		WD		
	NW 1164 56 100	10	15	50	-	110	5	12	4	371-374 A		WD		
	NW 1164 56 101	10	15	50	-	150	5	12	4	371-374 A		WD		

BALL NOSE END MILLS

4 flutes for steel | extra long series

1134

4 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- extra long series
- also suitable for model making



1/2 ▶

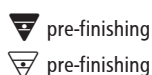
Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbor	ref. application	features
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extra long series

	NW 1134 56 030	3	30	-	-	60	1.5	3	4	350-351 A		
	NW 1134 56 031	3	30	-	-	100	1.5	3	4	350-351 A		
	NW 1134 46 040	4	30	-	-	60	2	4	4	352-355 A		
	NW 1134 56 040	4	30	-	-	60	2	4	4	352-355 A		
	NW 1134 56 041	4	30	-	-	75	2	4	4	352-355 A		
	NW 1134 46 050	5	35	-	-	70	2.5	5	4	385 A		
	NW 1134 56 050	5	35	-	-	70	2.5	5	4	385 A		
	NW 1134 56 051	5	40	-	-	100	2.5	5	4	385 A		
	NW 1134 46 060	6	40	-	-	100	3	6	4	356-360 A		
	NW 1134 56 060	6	40	-	-	100	3	6	4	356-360 A		
	NW 1134 56 061	6	50	-	-	150	3	6	4	356-360 A		
	NW 1134 56 080	8	40	-	-	100	4	8	4	361-365 A		
	NW 1134 56 081	8	50	-	-	150	4	8	4	361-365 A		
	NW 1134 46 100	10	50	-	-	100	5	10	4	366-370 A		
	NW 1134 56 100	10	45	-	-	100	5	10	4	366-370 A		
	NW 1134 56 101	10	60	-	-	150	5	10	4	366-370 A		
	NW 1134 56 120	12	45	-	-	100	6	12	4	371-374 A		
	NW 1134 46 121	12	75	-	-	150	6	12	4	371-374 A		
	NW 1134 56 121	12	75	-	-	150	6	12	4	371-374 A		

major application
minor application



4 flutes for steel | extra long series

4 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVTi-coated

- extra long series
- also suitable for model making

◀ 2/2

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features

A schematic diagram of a fiber structure. The fiber is represented as a vertical cylinder. The top portion is a straight cylinder with diameter d_2 and length l_1 . The bottom portion is a twisted section with diameter d_1 and length l_2 . The total length of the fiber is the sum of l_1 and l_2 .

[illegible]

BALL NOSE END MILLS

2 flutes f. non-ferr. mat. | no wd. | stand. series

1412

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVAS-coated

- standard series
- on demand: available with working depth

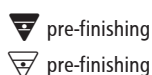


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVAS

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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no wd. standard series												
	NW 1412 47 010	1	1.5	-	-	50	0.5	4	2	352-355 A		NF HSM
	NW 1412 47 015	1.5	2.5	-	-	50	0.75	4	2	352-355 A		NEW NF HSM
	NW 1412 47 021	2	3	-	-	50	1	4	2	352-355 A		NEW NF HSM
	NW 1412 47 020	2	3	-	-	57	1	6	2	356-360 A		NF HSM
	NW 1412 47 030	3	4.5	-	-	57	1.5	6	2	356-360 A		NF HSM
	NW 1412 47 040	4	6	-	-	57	2	6	2	356-360 A		NF HSM
	NW 1412 47 050	5	7.5	-	-	57	2.5	6	2	356-360 A		NF HSM
	NW 1412 47 060	6	9	-	-	57	3	6	2	356-360 A		NF HSM
	NW 1412 47 080	8	12	-	-	63	4	8	2	361-365 A		NF HSM
	NW 1412 47 100	10	15	-	-	72	5	10	2	366-370 A		NF HSM
	NW 1412 47 120	12	18	-	-	83	6	12	2	371-374 A		NF HSM
	NW 1412 47 140	14	28	-	-	83	7	14	2	A		NF HSM
	NW 1412 47 160	16	24	-	-	92	8	16	2	375-378 A		NF HSM
	NW 1412 47 200	20	30	-	-	104	10	20	2	379-381 A		NF HSM

major application
minor application





BALL NOSE END MILLS

2 flutes f. non-ferr. mat. | no wd. | long series

1422

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVAS-coated

- long series
- on demand: available with working depth

1/2 ▶

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVAS

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors ref. application		features

no wd. long series														
	NW 1422 47 020	2	4	-	-	75	1	4	2	352-355 A				
	NW 1422 47 030	3	15	-	-	60	1.5	4	2	352-355 A				
	NW 1422 47 031	3	15	-	-	75	1.5	4	2	352-355 A				
	NW 1422 47 040	4	20	-	-	60	2	4	2	352-355 A				
	NW 1422 47 041	4	20	-	-	75	2	4	2	352-355 A				
	NW 1422 47 050	5	20	-	-	75	2.5	5	2	385 A				
	NW 1422 47 0501	5	20	-	-	75	2.5	6	2	356-360 A				
	NW 1422 47 051	5	20	-	-	100	2.5	5	2	385 A				
	NW 1422 47 0511	5	20	-	-	100	2.5	6	2	356-360 A				
	NW 1422 47 060	6	20	-	-	100	3	6	2	356-360 A				
	NW 1422 47 061	6	20	-	-	150	3	6	2	356-360 A				
	NW 1422 47 080	8	25	-	-	100	4	8	2	361-365 A				
	NW 1422 47 081	8	25	-	-	150	4	8	2	361-365 A				
	NW 1422 47 100	10	25	-	-	100	5	10	2	366-370 A				
	NW 1422 47 101	10	25	-	-	150	5	10	2	366-370 A				
	NW 1422 47 120	12	30	-	-	100	6	12	2	371-374 A				
	NW 1422 47 121	12	30	-	-	150	6	12	2	371-374 A				
	NW 1422 47 160	16	30	-	-	100	8	16	2	375-378 A				
	NW 1422 47 161	16	30	-	-	150	8	16	2	375-378 A				

Solid carbide end mills

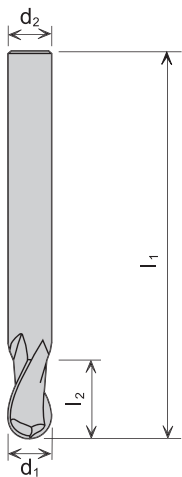
catalogue no.

 d_1
 l_2
 l_3
 d_3
 l_1
 r
 d_2
 z

ref. pg. arbors
ref. application

features

no wd. | long series



NWV 1422 47 201

20

35

-

-

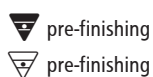
150

10

20

2

379-381
A

major application
minor application


2 flutes f. non-ferr. mat. | w. wd. | stand. + long series

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix

- standard and long series
- with working depth

1 / 2 ▶

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVAS

catalogue no.

d

1.

1.

 d_2

1.

r

2

2

2

cati

A schematic diagram of a cylindrical specimen. The total length is labeled l_1 . The diameter of the upper part is labeled d_2 . The diameter of the lower part is labeled d_1 . The necked region, which is the transition between the two diameters, has a length labeled l_2 .

w. wd. standard series											NEW
	NW 1432 47 0101	1	1.5	6	0.95	50	0.5	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0102	1	1.5	10	0.95	50	0.5	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0103	1	1.5	15	0.95	50	0.5	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0104	1	1.5	20	0.95	75	0.5	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0105	1	1.5	25	0.95	75	0.5	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0106	1	1.5	30	0.95	75	0.5	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0152	1.5	2.5	10	1.4	50	0.75	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0153	1.5	2.5	15	1.4	50	0.75	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0154	1.5	2.5	20	1.4	75	0.75	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0155	1.5	2.5	25	1.4	75	0.75	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0156	1.5	2.5	30	1.4	75	0.75	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0212	2	3	10	1.9	50	1	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0213	2	3	15	1.9	50	1	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0214	2	3	20	1.9	75	1	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 02141	2	3	25	1.9	75	1	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0215	2	3	30	1.9	75	1	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 02151	2	3	35	1.9	75	1	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0253	2.5	4	15	2.4	50	1.25	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM
	NW 1432 47 0254	2.5	4	20	2.4	75	1.25	4	2	352-355 A	☒ NEW ☐ WD ☐ NF ☐ HSM

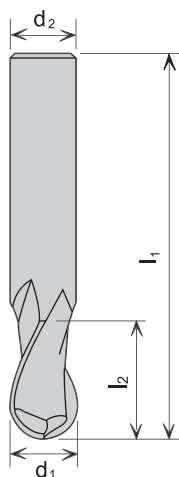
Solid carbide end mills

catalogue no.

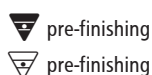
 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application

features

w. wd. | standard series



NV 1432 47 02551	2.5	4	35	2.4	75	1.25	4	2	352-355 A	NEW WD NF HSM
NV 1432 47 0302	3	4.5	10	2.9	57	1.5	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0304	3	4.5	20	2.9	57	1.5	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0305	3	4.5	30	2.9	75	1.5	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0306	3	4.5	40	2.9	75	1.5	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0402	4	6	10	3.8	57	2	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0404	4	6	20	3.8	57	2	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0405	4	6	30	3.8	75	2	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0406	4	6	40	3.8	75	2	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0604	6	6	20	5.8	57	3	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0605	6	6	30	5.8	75	3	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0606	6	6	40	5.8	75	3	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0607	6	6	50	5.8	100	3	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 0608	6	6	70	5.8	100	3	6	2	356-360 A	NEW WD NF HSM
NV 1432 47 08051	8	12	35	7.8	90	4	8	2	361-365 A	NEW WD NF HSM
NV 1432 47 0807	8	12	50	7.8	100	4	8	2	361-365 A	NEW WD NF HSM
NV 1432 47 0808	8	12	70	7.8	100	4	8	2	361-365 A	NEW WD NF HSM
NV 1432 47 1006	10	15	40	9.8	72	5	10	2	366-370 A	NEW WD NF HSM
NV 1432 47 1007	10	15	50	9.8	100	5	10	2	366-370 A	NEW WD NF HSM
NV 1432 47 1008	10	15	70	9.8	100	5	10	2	366-370 A	NEW WD NF HSM
NV 1432 47 1009	10	15	100	9.8	150	5	10	2	366-370 A	NEW WD NF HSM
NV 1432 47 1206	12	18	40	11.8	83	6	12	2	371-374 A	NEW WD NF HSM
NV 1432 47 1207	12	18	50	11.8	110	6	12	2	371-374 A	NEW WD NF HSM
NV 1432 47 1208	12	18	70	11.8	110	6	12	2	371-374 A	NEW WD NF HSM
NV 1432 47 1209	12	18	100	11.8	150	6	12	2	371-374 A	NEW WD NF HSM
NV 1432 47 1609	16	24	100	15.8	150	8	16	2	375-378 A	NEW WD NF HSM
NV 1432 47 2009	20	30	100	19.8	150	10	20	2	379-381 A	NEW WD NF HSM

major application
minor application



BALL NOSE END MILLS

2 flutes f. non-ferr. mat. | PCD | spherical | w. wd.

1600

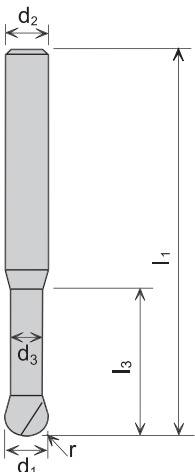
- 2 flutes, plain shank, ball nose, centre cutting
- for non - ferrous materials
- with working depth

• **Attention:**

Please use these end mills only with approach angle of high-speed spindle!

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							PCD	

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r	d_2	z					

PCD spherical w. wd.														
	NW 1600 20 040	4	-	15	3.8	50	2	6	2	356-360 A				
	NW 1600 20 050	5	-	20	4.8	75	2.5	6	2	356-360 A				
	NW 1600 20 060	6	-	30	5.8	75	3	6	2	356-360 A				
	NW 1600 20 080	8	-	35	7.8	100	4	8	2	361-365 A				
	NW 1600 20 100	10	-	35	9.8	100	5	10	2	366-370 A				
	NW 1600 20 120	12	-	50	-	100	6	10	2	366-370 A				

BALL NOSE END MILLS

2 fl. f. NF mat. + high-temp. alloys | no wd. | stand.

1462

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVCN-coated

- standard series
- machining of titanium alloy possible
- on demand: available with working depth

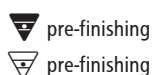


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVCN

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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no. wd. standard series														
	NW 1462 43 004	0.4	0.6	-	-	50	0.2	4	2	352-355 A				
	NW 1462 43 010	1	1.5	-	-	50	0.5	4	2	352-355 A				
	NW 1462 43 015	1.5	2.5	-	-	57	0.75	6	2	356-360 A				
	NW 1462 43 020	2	3	-	-	57	1	6	2	356-360 A				
	NW 1462 43 025	2.5	4	-	-	57	1.25	6	2	356-360 A				
	NW 1462 43 030	3	4.5	-	-	57	1.5	6	2	356-360 A				
	NW 1462 43 040	4	6	-	-	57	2	6	2	356-360 A				
	NW 1462 43 050	5	7.5	-	-	57	2.5	6	2	356-360 A				
	NW 1462 43 060	6	9	-	-	57	3	6	2	356-360 A				
	NW 1462 43 080	8	12	-	-	63	4	8	2	361-365 A				
	NW 1462 43 090	9	13.5	-	-	72	4.5	10	2	366-370 A				
	NW 1462 43 100	10	15	-	-	72	5	10	2	366-370 A				
	NW 1462 43 120	12	18	-	-	83	6	12	2	371-374 A				
	NW 1462 43 160	16	24	-	-	92	8	16	2	375-378 A				

major application
minor application





BALL NOSE END MILLS

2 flutes f. NF mat. + high temp. alloys | no wd. | long series

1472

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVCN-coated

- long series
- machining of titanium alloy possible
- on demand: available with working depth

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVCN

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r	d_2	z					

no. wd. long series													
	NW 1472 43 051	5	20	-	-	100	2.5	5	2	385 A			
	NW 1472 43 061	6	20	-	-	150	3	6	2	356-360 A			

BALL NOSE END MILLS

2 fl. f. graphite | finishing

1452

2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVDiaG+N-coated

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: for graphite machining only**



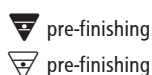
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Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills															
catalogue no.										ref. pg. arbors		ref. application			features
d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z								

w. + no wd. std. + long series														
	SVV 1452 48 00403	0.4	0.6	2.5	0.37	50	0.2	4	2	352-355 A				
	SVV 1452 48 00404	0.4	0.6	5	0.37	50	0.2	4	2	352-355 A				
	NVV 1452 48 0050	0.5	0.8	-	-	50	0.25	4	2	352-355 A				
	SVV 1452 48 00503	0.5	0.8	3.5	0.45	50	0.25	4	2	352-355 A				
	NVV 1452 48 00510	0.5	0.8	5	0.45	50	0.25	4	2	352-355 A				
	SVV 1452 48 00504	0.5	0.8	7	0.45	50	0.25	4	2	352-355 A				
	NVV 1452 48 0052	0.5	0.8	10	0.45	50	0.25	4	2	352-355 A				
	SVV 1452 48 00603	0.6	0.9	3.5	0.55	50	0.3	4	2	352-355 A				
	SVV 1452 48 00604	0.6	0.9	7	0.55	50	0.3	4	2	352-355 A				
	SVV 1452 48 00803	0.8	1.2	5	0.75	50	0.4	4	2	352-355 A				
	SVV 1452 48 00804	0.8	1.2	10	0.75	50	0.4	4	2	352-355 A				
	NVV 1452 48 010	1	1.5	-	-	50	0.5	4	2	352-355 A				
	NVV 1452 48 01000	1	1.5	5	0.95	50	0.5	4	2	352-355 A				
	NVV 1452 48 0101	1	1.5	10	0.95	50	0.5	4	2	352-355 A				
	NVV 1452 48 0102	1	1.5	15	0.95	50	0.5	4	2	352-355 A				
	NVV 1452 48 0103	1	1.5	20	0.95	50	0.5	4	2	352-355 A				
	NVV 1452 48 011	1	1.5	-	-	57	0.5	6	2	356-360 A				
	NVV 1452 48 01510	1.5	2.3	-	-	50	0.75	4	2	352-355 A				
	NVV 1452 48 0152	1.5	2.3	10	1.4	50	0.75	4	2	352-355 A				

major application
minor application





BALL NOSE END MILLS

2 fl. f. graphite | finishing

1452

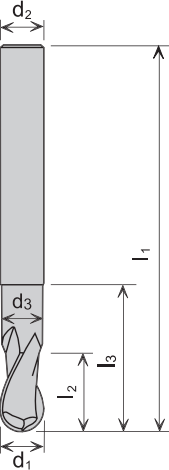
2 flutes, plain shank, ball nose, centre cutting, 30° right hand helix, PVDiaG+N-coated

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: for graphite machining only**

2/3

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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w. + no wd. std. + long series														
	NW 1452 48 0153	1.5	2.3	25	1.4	75	0.75	4	2	352-355 A				
	NW 1452 48 0200	2	3	-	-	50	1	4	2	352-355 A				
	NW 1452 48 0201	2	3	5	1.9	50	1	4	2	352-355 A				
	NW 1452 48 0202	2	3	10	1.9	50	1	4	2	352-355 A				
	NW 1452 48 0203	2	3	15	1.9	50	1	4	2	352-355 A				
	NW 1452 48 0204	2	3	20	1.9	75	1	4	2	352-355 A				
	NW 1452 48 0205	2	3	25	1.9	75	1	4	2	352-355 A				
	NW 1452 48 021	2	3	-	-	57	1	6	2	356-360 A				
	NW 1452 48 0301	3	4.5	5	2.9	50	1.5	4	2	352-355 A				
	NW 1452 48 0302	3	4.5	10	2.9	50	1.5	4	2	352-355 A				
	NW 1452 48 0303	3	4.5	15	2.9	50	1.5	4	2	352-355 A				
	NW 1452 48 0304	3	4.5	20	2.9	75	1.5	4	2	352-355 A				
	NW 1452 48 0305	3	4.5	25	2.9	75	1.5	4	2	352-355 A				
	NW 1452 48 0306	3	4.5	30	2.9	100	1.5	4	2	352-355 A				
	NW 1452 48 0402	4	6	10	3.8	50	2	4	2	352-355 A				
	NW 1452 48 0403	4	6	15	3.8	50	2	4	2	352-355 A				
	NW 1452 48 0404	4	6	20	3.8	75	2	4	2	352-355 A				
	NW 1452 48 0405	4	6	25	3.8	75	2	4	2	352-355 A				
	NW 1452 48 0406	4	6	45	3.8	100	2	4	2	352-355 A				

catalogue no.

$$d_1 \quad l_2 \quad l_3 \quad d_3 \quad l_1 \quad r \quad d_2 \quad z$$

ref. pg. arbors
ref. application
features

NWV 1452 48 0502	5	7.5	10	4.8	57	2.5	5	2	385 A	   
NWV 1452 48 0503	5	7.5	25	4.8	75	2.5	5	2	385 A	   
NWV 1452 48 0504	5	7.5	45	4.8	100	2.5	5	2	385 A	   
NWV 1452 48 0600	6	9	-	-	57	3	6	2	356-360 A	  
NWV 1452 48 0601	6	9	10	5.8	57	3	6	2	356-360 A	   
NWV 1452 48 0603	6	9	15	5.8	57	3	6	2	356-360 A	   
NWV 1452 48 0604	6	9	20	5.8	75	3	6	2	356-360 A	   
NWV 1452 48 0605	6	9	25	5.8	75	3	6	2	356-360 A	   
NWV 1452 48 0606	6	9	30	5.8	75	3	6	2	356-360 A	   
NWV 1452 48 0607	6	9	45	5.8	100	3	6	2	356-360 A	   
NWV 1452 48 0608	6	9	60	5.8	150	3	6	2	356-360 A	   
NWV 1452 48 0800	8	12	-	-	63	4	8	2	361-365 A	  
NWV 1452 48 0801	8	12	20	7.8	63	4	8	2	361-365 A	   
NWV 1452 48 0802	8	12	25	7.8	63	4	8	2	361-365 A	   
NWV 1452 48 081	8	12	45	7.8	100	4	8	2	361-365 A	   
NWV 1452 48 082	8	12	60	7.8	150	4	8	2	361-365 A	   
NWV 1452 48 100	10	15	-	-	72	5	10	2	366-370 A	  
NWV 1452 48 1009	10	15	25	9.8	72	5	10	2	366-370 A	   
NWV 1452 48 1010	10	15	45	9.8	100	5	10	2	366-370 A	   
NWV 1452 48 1209	12	18	25	11.8	83	6	12	2	371-374 A	   
NWV 1452 48 1210	12	18	45	11.8	110	6	12	2	371-374 A	

finishing
finishing



BALL NOSE END MILLS

3 fl. f. graphite | pre-finishing + roughing | w.+ no wd. | std.+long

1453

3 flutes, plain shank, ball nose, centre cutting, 30° right hand helix,

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: for graphite machining only**

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

w. + no wd. std. + long series													
	NW 1453 48 025	2.5	10	-	-	50	1.25	4	3	352-355 A			
	NW 1453 48 050	5	35	-	-	75	2.5	5	3	385 A			
	NW 1453 48 1000	10	15	-	-	72	5	10	3	366-370 A			
	NW 1453 48 103	10	25	-	-	80	5	10	3	366-370 A			
	NW 1453 48 1009	10	15	25	9.8	72	5	10	3	366-370 A			
	NW 1453 48 1010	10	15	45	9.8	100	5	10	3	366-370 A			
	NW 1453 48 1020	10	15	60	9.8	150	5	10	3	366-370 A			
	NW 1453 48 1200	12	18	-	-	83	6	12	3	371-374 A			
	NW 1453 48 124	12	25	-	-	90	6	12	3	371-374 A			
	NW 1453 48 120	12	60	-	-	150	6	12	3	371-374 A			
	NW 1453 48 1209	12	18	25	11.8	83	6	12	3	371-374 A			
	NW 1453 48 1210	12	18	45	11.8	100	6	12	3	371-374 A			
	NW 1453 48 1220	12	18	60	11.8	150	6	12	3	371-374 A			
	NW 1453 48 160	16	45	-	-	100	8	16	3	375-378 A			
	NW 1453 48 1610	16	24	45	15.8	100	8	16	3	375-378 A			
	NW 1453 48 162	16	24	60	15.8	150	8	16	3	375-378 A			
	NW 1453 48 2000	20	30	45	19.8	100	10	20	3	379-381 A			
	NW 1453 48 2010	20	30	60	19.8	150	10	20	3	379-381 A			

CORNER RADIUS END MILLS FGT

2 flutes for steel | w. wd. | high-precision | std + long

0192

2 flutes, plain shank, corner radius, centre cutting, right hand helix, PVTiH-coated

- new ultra-micrograin carbide
- modified coating, optimized geometries
- with working depths up to 20 times d1
- high precision, $r=+/-0.005$ mm, $d1= -0.015$ mm

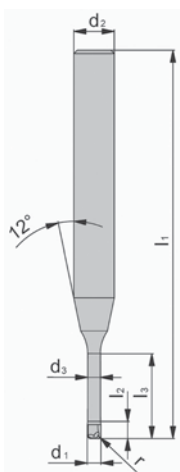


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Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

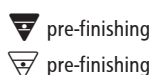
Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r	d_2	z					

w. wd. | high-precision



NW 0192 85 00411	0.4	0.4	1.5	0.385	50	0.1	4	2	352-355 A	
NW 0192 85 00412	0.4	0.4	3	0.385	50	0.1	4	2	352-355 A	
NW 0192 85 00413	0.4	0.4	5	0.385	50	0.1	4	2	352-355 A	
NW 0192 85 00511	0.5	0.5	1.5	0.48	50	0.1	4	2	352-355 A	
NW 0192 85 00512	0.5	0.5	3	0.48	50	0.1	4	2	352-355 A	
NW 0192 85 00513	0.5	0.5	5	0.48	50	0.1	4	2	352-355 A	
NW 0192 85 00514	0.5	0.5	10	0.48	50	0.1	4	2	352-355 A	
NW 0192 85 00612	0.6	0.6	3	0.58	50	0.1	4	2	352-355 A	
NW 0192 85 00613	0.6	0.6	5	0.58	50	0.1	4	2	352-355 A	
NW 0192 85 00614	0.6	0.6	10	0.58	50	0.1	4	2	352-355 A	
NW 0192 85 00811	0.8	0.8	3	0.78	50	0.1	4	2	352-355 A	
NW 0192 85 00812	0.8	0.8	5	0.78	50	0.1	4	2	352-355 A	
NW 0192 85 00813	0.8	0.8	10	0.78	50	0.1	4	2	352-355 A	
NW 0192 85 00814	0.8	0.8	15	0.78	50	0.1	4	2	352-355 A	
NW 0192 85 01021	1	1	5	0.98	50	0.2	4	2	352-355 A	
NW 0192 85 01022	1	1	10	0.98	50	0.2	4	2	352-355 A	
NW 0192 85 01023	1	1	15	0.98	50	0.2	4	2	352-355 A	
NW 0192 85 01024	1	1	20	0.98	75	0.2	4	2	352-355 A	
NW 0192 85 01025	1	1	25	0.98	75	0.2	4	2	352-355 A	

major application
minor application





CORNER RADIUS END MILLS FGT

2 flutes for steel | w. wd. | high-precision | std + long

0192

2 flutes, plain shank, corner radius, centre cutting, right hand helix, PVTiH-coated

- new ultra-micrograin carbide
- modified coating, optimized geometries
- with working depths up to 20 times d1
- high precision, $r = \pm 0.005 \text{ mm}$, $d1 = -0.015 \text{ mm}$

2/4

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

Solid carbide end mills	catalogue no.									ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r	d_2	z				

w. wd. high-precision												
	NW 0192 85 01521	1.5	1.5	5	1.45	50	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 01522	1.5	1.5	10	1.45	50	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 01523	1.5	1.5	15	1.45	50	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 01524	1.5	1.5	20	1.45	75	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 01525	1.5	1.5	25	1.45	75	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 02021	2	2	5	1.95	50	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 02022	2	2	10	1.95	50	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 02023	2	2	15	1.95	50	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 02024	2	2	20	1.95	75	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 02025	2	2	25	1.95	75	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 02026	2	2	30	1.95	75	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 02027	2	2	40	1.95	75	0.2	4	2	352-355 A		WD HSM
	NW 0192 85 02051	2	2	5	1.95	50	0.5	4	2	352-355 A		WD HSM
	NW 0192 85 02052	2	2	10	1.95	50	0.5	4	2	352-355 A		WD HSM
	NW 0192 85 02053	2	2	15	1.95	50	0.5	4	2	352-355 A		WD HSM
	NW 0192 85 02054	2	2	20	1.95	75	0.5	4	2	352-355 A		WD HSM
	NW 0192 85 02055	2	2	25	1.95	75	0.5	4	2	352-355 A		WD HSM
	NW 0192 85 02056	2	2	30	1.95	75	0.5	4	2	352-355 A		WD HSM
	NW 0192 85 02057	2	2	40	1.95	75	0.5	4	2	352-355 A		WD HSM

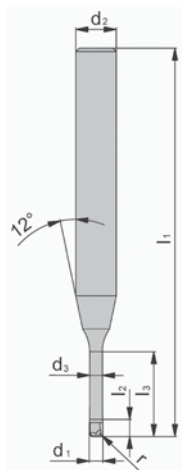
Solid carbide end mills

catalogue no.

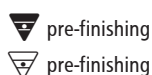
 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application

features

w. wd. | high-precision



NW 0192 85 03021	3	3	10	2.95	57	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 03022	3	3	15	2.95	57	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 03023	3	3	20	2.95	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 03024	3	3	25	2.95	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 03025	3	3	30	2.95	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 03026	3	3	40	2.95	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 03051	3	3	10	2.95	57	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 03052	3	3	15	2.95	57	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 03053	3	3	20	2.95	75	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 03054	3	3	25	2.95	75	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 03055	3	3	30	2.95	75	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 03056	3	3	40	2.95	75	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 04021	4	4	10	3.9	57	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 04022	4	4	15	3.9	57	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 04023	4	4	20	3.9	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 04024	4	4	25	3.9	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 04025	4	4	30	3.9	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 04026	4	4	40	3.9	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 04051	4	4	10	3.9	57	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 04052	4	4	15	3.9	57	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 04053	4	4	20	3.9	75	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 04054	4	4	25	3.9	75	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 04055	4	4	30	3.9	75	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 04056	4	4	40	3.9	75	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 05021	5	5	10	4.9	57	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 05023	5	5	20	4.9	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 05025	5	5	30	4.9	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 05026	5	5	40	4.9	75	0.2	6	2	356-360 A	✓ WD HSM
NW 0192 85 05051	5	5	10	4.9	57	0.5	6	2	356-360 A	✓ WD HSM
NW 0192 85 05053	5	5	20	4.9	75	0.5	6	2	356-360 A	✓ WD HSM

major application
minor application



CORNER RADIUS END MILLS FGT

2 flutes for steel | w. wd. | high-precision | std + long

0192

2 flutes, plain shank, corner radius, centre cutting, right hand helix, PVTiH-coated

- new ultra-micrograin carbide
- modified coating, optimized geometries
- with working depths up to 20 times d1
- high precision, $r = \pm 0.005 \text{ mm}$, $d1 = -0.015 \text{ mm}$

4/4

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r	d_2	z					

w. wd. high-precision													
	NW 0192 85 05055	5	5	30	4.9	75	0.5	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 05056	5	5	40	4.9	75	0.5	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 06021	6	6	10	5.85	57	0.2	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 06023	6	6	20	5.85	75	0.2	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 06025	6	6	30	5.85	75	0.2	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 06026	6	6	40	5.85	75	0.2	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 06051	6	6	10	5.85	57	0.5	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 06053	6	6	20	5.85	75	0.5	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 06055	6	6	30	5.85	75	0.5	6	2	356-360 A	☒	WD	HSM
	NW 0192 85 06056	6	6	40	5.85	75	0.5	6	2	356-360 A	☒	WD	HSM

CORNER RADIUS END MILLS FGT

2 flutes for steel | no wd. | high-precision | std + long

0722

2 flutes, plain shank, corner radius, centre cutting, right hand helix, PVTiH-coated

- new ultra-micrograin carbide
- modified coating, optimized geometries
- high precision, $r=+/-0.005$ mm, $d1= -0.015$ mm
- standard and long series, without working depth

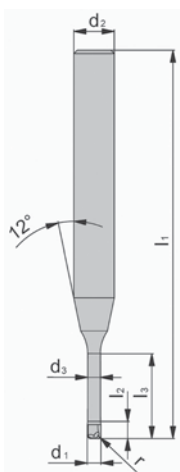


1/3 ▶

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

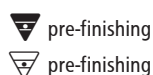
Solid carbide end mills	catalogue no.	d_1	l_2	l_3	d_3	l_1	r	d_2	z	ref. pg. arbors	ref. application	features
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no wd. | high-precision



NW 0722 85 004	0.4	0.4	-	-	50	0.1	4	2	352-355 A	
NW 0722 85 005	0.5	0.5	-	-	50	0.1	4	2	352-355 A	
NW 0722 85 006	0.6	0.6	-	-	50	0.1	4	2	352-355 A	
NW 0722 85 008	0.8	0.8	-	-	50	0.1	4	2	352-355 A	
NW 0722 85 010	1	1	-	-	50	0.2	4	2	352-355 A	
NW 0722 85 0101	1	1	-	-	75	0.2	4	2	352-355 A	
NW 0722 85 015	1.5	1.5	-	-	50	0.2	4	2	352-355 A	
NW 0722 85 0151	1.5	1.5	-	-	75	0.2	4	2	352-355 A	
NW 0722 85 02002	2	2	-	-	50	0.2	4	2	352-355 A	
NW 0722 85 02005	2	2	-	-	50	0.5	4	2	352-355 A	
NW 0722 85 02102	2	2	-	-	75	0.2	4	2	352-355 A	
NW 0722 85 02105	2	2	-	-	75	0.5	4	2	352-355 A	
NW 0722 85 03002	3	3	-	-	57	0.2	6	2	356-360 A	
NW 0722 85 03005	3	3	-	-	57	0.5	6	2	356-360 A	
NW 0722 85 03102	3	3	-	-	75	0.2	6	2	356-360 A	
NW 0722 85 03105	3	3	-	-	75	0.5	6	2	356-360 A	
NW 0722 85 04002	4	4	-	-	57	0.2	6	2	356-360 A	
NW 0722 85 04005	4	4	-	-	57	0.5	6	2	356-360 A	
NW 0722 85 04102	4	4	-	-	75	0.2	6	2	356-360 A	

major application
minor application





CORNER RADIUS END MILLS FGT

2 flutes for steel | no wd. | high-precision | std + long

0722

2 flutes, plain shank, corner radius, centre cutting, right hand helix, PVTiH-coated

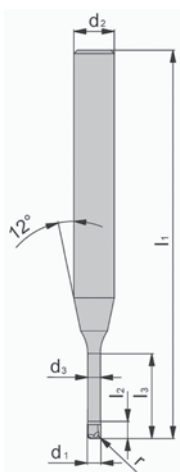
- new ultra-micrograin carbide
- modified coating, optimized geometries
- high precision, $r=+/-0.005$ mm, $d_1 = -0.015$ mm
- standard and long series, without working depth

2/3

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVTiH

Solid carbide end mills	catalogue no.	d_1	l_2	l_3	d_3	l_1	r	d_2	z	ref. pg. arbors	ref. application	features
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no wd. | high-precision



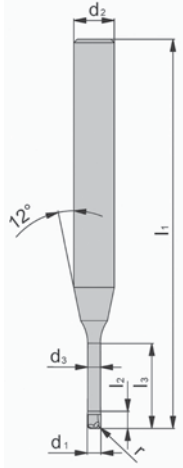
NW 0722 85 04105	4	4	-	-	75	0.5	6	2	356-360 A	
NW 0722 85 05002	5	5	-	-	57	0.2	6	2	356-360 A	
NW 0722 85 05005	5	5	-	-	57	0.5	6	2	356-360 A	
NW 0722 85 05102	5	5	-	-	75	0.2	6	2	356-360 A	
NW 0722 85 05105	5	5	-	-	75	0.5	6	2	356-360 A	
NW 0722 85 06002	6	6	-	-	57	0.2	6	2	356-360 A	
NW 0722 85 06005	6	6	-	-	57	0.5	6	2	356-360 A	
NW 0722 85 06010	6	6	-	-	57	1	6	2	356-360 A	
NW 0722 85 06102	6	6	-	-	75	0.2	6	2	356-360 A	
NW 0722 85 06105	6	6	-	-	75	0.5	6	2	356-360 A	
NW 0722 85 06110	6	6	-	-	75	1	6	2	356-360 A	
NW 0722 85 08005	8	8	-	-	63	0.5	8	2	361-365 A	
NW 0722 85 08010	8	8	-	-	63	1	8	2	361-365 A	
NW 0722 85 08105	8	8	-	-	90	0.5	8	2	361-365 A	
NW 0722 85 08110	8	8	-	-	90	1	8	2	361-365 A	
NW 0722 85 10010	10	10	-	-	72	1	10	2	366-370 A	
NW 0722 85 10015	10	10	-	-	72	1.5	10	2	366-370 A	
NW 0722 85 10110	10	10	-	-	100	1	10	2	366-370 A	
NW 0722 85 10115	10	10	-	-	100	1.5	10	2	366-370 A	

Solid carbide end mills

catalogue no.

 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application
features

no wd. | high-precision



NW 0722 85 12010

12

12

-

-

83

1

12

2

371-374
A

NW 0722 85 12020

12

12

-

-

83

2

12

2

371-374
A

NW 0722 85 12110

12

12

-

-

110

1

12

2

371-374
A

NW 0722 85 12120

12

12

-

-

110

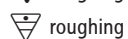
2

12

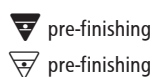
2

371-374
Amajor application
minor application

roughing



roughing



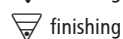
pre-finishing



pre-finishing



finishing



finishing



CORNER RADIUS END MILLS

2 flutes for steel | no wd. | stand. series

0332

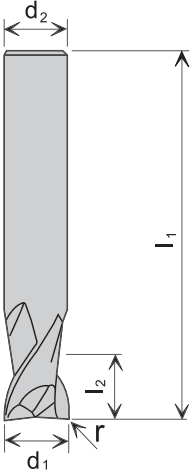
2 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- without working depths
- on demand: available with working depth

1/2 ▶

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features

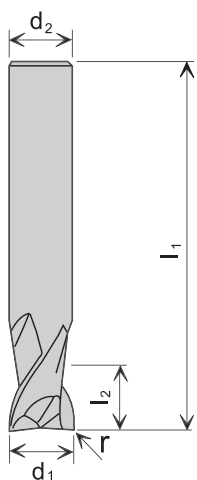
no wd. standard series															
	NW 0332 56 00501	0.5	0.8	-	-	50	0.1	4	2	352-355 A					
	NW 0332 56 01001	1	1.5	-	-	50	0.1	4	2	352-355 A					
	NW 0332 56 01002	1	1.5	-	-	50	0.2	4	2	352-355 A					
	NW 0332 56 01502	1.5	2.3	-	-	50	0.2	4	2	352-355 A					
	NW 0332 56 015021	1.5	3	8	1.4	57	0.2	6	2	356-360 A					
	NW 0332 56 02002	2	3	-	-	50	0.2	4	2	352-355 A					
	NW 0332 56 02003	2	3	-	-	50	0.3	4	2	352-355 A					
	NW 0332 56 020	2	3	-	-	50	0.5	4	2	352-355 A					
	NW 0332 56 03002	3	4.5	-	-	50	0.2	4	2	352-355 A					
	NW 0332 56 03003	3	4.5	-	-	50	0.3	4	2	352-355 A					
	NW 0332 56 030	3	4.5	-	-	50	0.5	4	2	352-355 A					
	NW 0332 56 031	3	4.5	-	-	50	1	4	2	352-355 A					
	NW 0332 56 0311	3	4.5	-	-	57	1	6	2	356-360 A					
	NW 0332 56 04002	4	6	-	-	50	0.2	4	2	352-355 A					
	NW 0332 56 040	4	6	-	-	50	0.5	4	2	352-355 A					
	NW 0332 56 041	4	6	-	-	50	1	4	2	352-355 A					
	NW 0332 56 040021	4	6	-	-	57	0.2	6	2	356-360 A					
	NW 0332 56 0401	4	6	-	-	57	0.5	6	2	356-360 A					
	NW 0332 56 0411	4	6	-	-	57	1	6	2	356-360 A					

Solid carbide end mills

catalogue no.

 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application
features

no wd. | standard series



NW 0332 56 05002	5	7.5	-	-	57	0.2	6	2	356-360 A	✓ HSM
NW 0332 56 050	5	7.5	-	-	57	0.5	6	2	356-360 A	✓ HSM
NW 0332 56 051	5	7.5	-	-	57	1	6	2	356-360 A	✓ HSM
NW 0332 56 06003	6	9	-	-	57	0.3	6	2	356-360 A	✓ HSM
NW 0332 56 060	6	9	-	-	57	0.5	6	2	356-360 A	✓ HSM
NW 0332 56 061	6	9	-	-	57	1	6	2	356-360 A	✓ HSM
NW 0332 56 062	6	9	-	-	57	1.5	6	2	356-360 A	✓ HSM
NW 0332 56 080	8	12	-	-	63	0.5	8	2	361-365 A	✓ HSM
NW 0332 56 081	8	12	-	-	63	1	8	2	361-365 A	✓ HSM
NW 0332 56 082	8	12	-	-	63	1.5	8	2	361-365 A	✓ HSM
NW 0332 56 083	8	12	-	-	63	2	8	2	361-365 A	✓ HSM
NW 0332 56 100	10	15	-	-	72	0.5	10	2	366-370 A	✓ HSM
NW 0332 56 101	10	15	-	-	72	1	10	2	366-370 A	✓ HSM
NW 0332 56 102	10	15	-	-	72	1.5	10	2	366-370 A	✓ HSM
NW 0332 56 103	10	15	-	-	72	2	10	2	366-370 A	✓ HSM
NW 0332 56 120	12	18	-	-	83	0.5	12	2	371-374 A	✓ HSM
NW 0332 56 1206	12	18	-	-	83	0.6	12	2	371-374 A	✓ HSM
NW 0332 56 121	12	18	-	-	83	1	12	2	371-374 A	✓ HSM
NW 0332 56 122	12	18	-	-	83	1.5	12	2	371-374 A	✓ HSM
NW 0332 56 123	12	18	-	-	83	2	12	2	371-374 A	✓ HSM

major application
minor application
 roughing
 pre-finishing

 pre-finishing
 finishing

 finishing
 finishing



CORNER RADIUS END MILLS

2 flutes for steel | w. wd. | long series

0362

2 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVTi-coated

- long series
- with working depth

1/2 ▶

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.						ref. pg. arbors ref. application features					
	d_1	l_2	l_3	d_3	l_1	r	d_2	z			

w. wd. long series											
	NW 0362 56 020	2	3	10	1.9	75	0.5	6	2	356-360 A	
	NW 0362 56 030	3	4.5	12	2.9	75	0.5	6	2	356-360 A	
	NW 0362 56 031	3	4.5	12	2.9	75	1	6	2	356-360 A	
	NW 0362 56 040	4	6	12	3.8	75	0.5	6	2	356-360 A	
	NW 0362 56 041	4	6	12	3.8	75	1	6	2	356-360 A	
	NW 0362 56 050	5	7.5	15	4.8	75	0.5	6	2	356-360 A	
	NW 0362 56 051	5	7.5	15	4.8	75	1	6	2	356-360 A	
	NW 0362 56 060	6	9	20	5.8	75	0.5	6	2	356-360 A	
	NW 0362 56 061	6	9	20	5.8	75	1	6	2	356-360 A	
	NW 0362 56 0611	6	9	20	5.8	100	1	6	2	356-360 A	
	NW 0362 56 062	6	9	20	5.8	75	1.5	6	2	356-360 A	
	NW 0362 56 080	8	12	26	7.8	90	0.5	8	2	361-365 A	
	NW 0362 56 081	8	12	26	7.8	90	1	8	2	361-365 A	
	NW 0362 56 082	8	12	26	7.8	90	1.5	8	2	361-365 A	
	NW 0362 56 083	8	12	26	7.8	90	2	8	2	361-365 A	
	NW 0362 56 100	10	15	31	9.8	100	0.5	10	2	366-370 A	
	NW 0362 56 101	10	15	31	9.8	100	1	10	2	366-370 A	
	NW 0362 56 102	10	15	31	9.8	100	1.5	10	2	366-370 A	
	NW 0362 56 103	10	15	31	9.8	100	2	10	2	366-370 A	

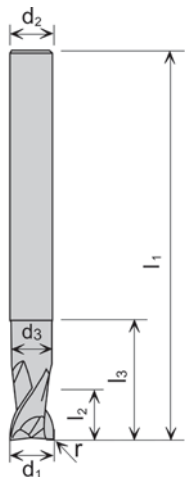
Solid carbide end mills

catalogue no.

 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application

features

w. wd. | long series



NW 0362 56 120

12

18

37

11.8

110

0.5

12

2

371-374

A

☒ WD ☒ HSM

NW 0362 56 121

12

18

37

11.8

110

1

12

2

371-374

A

☒ WD ☒ HSM

NW 0362 56 122

12

18

37

11.8

110

1.5

12

2

371-374

A

☒ WD ☒ HSM

NW 0362 56 123

12

18

37

11.8

110

2

12

2

371-374

A

☒ WD ☒ HSM
major application
minor application
☒ roughing
☐ roughing

☒ pre-finishing
☐ pre-finishing

☒ finishing
☐ finishing



CORNER RADIUS END MILLS

2 flutes f. steel | reinforced shank | tapered wd.

0162

2 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVTi-coated

- long series
- l3: maximum working depth; 1.5° draft angle behind cutting edge

1/2 ▶

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.						ref. pg. arbors ref. application features					
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z			

reinforced shank tapered wd.											
	NW 0162 56 020	2	3	25	-	75	0.2	6	2	356-360 A	WD HSM
	NW 0162 56 0206	2	3	39	-	75	0.2	6	2	356-360 A	WD HSM
	NW 0162 56 022	2	3	25	-	75	0.5	6	2	356-360 A	WD HSM
	NW 0162 56 0221	2	3	39	-	75	0.5	6	2	356-360 A	WD HSM
	NW 0162 56 021	2	3	50	-	100	0.5	6	2	356-360 A	WD HSM
	NW 0162 56 03005	3	4.5	25	-	75	0.5	6	2	356-360 A	WD HSM
	NW 0162 56 030	3	4.5	25	-	75	1	6	2	356-360 A	WD HSM
	NW 0162 56 0301	3	4.5	39	-	75	1	6	2	356-360 A	WD HSM
	NW 0162 56 031	3	4.5	50	-	100	1	6	2	356-360 A	WD HSM
	NW 0162 56 04005	4	6	25	-	75	0.5	6	2	356-360 A	WD HSM
	NW 0162 56 040	4	6	25	-	75	1	6	2	356-360 A	WD HSM
	NW 0162 56 041	4	6	44	-	100	1	6	2	356-360 A	WD HSM
	NW 0162 56 050	5	7.5	25	-	75	1	6	2	356-360 A	WD HSM
	NW 0162 56 051	5	7.5	50	-	90	1	8	2	361-365 A	WD HSM
	NW 0162 56 060	6	9	35	-	75	1	8	2	361-365 A	WD HSM
	NW 0162 56 061	6	9	50	-	100	1	10	2	366-370 A	WD HSM
	NW 0162 56 080	8	12	50	-	100	2	10	2	366-370 A	WD HSM
	NW 0162 56 081	8	12	90	-	150	2	12	2	371-374 A	WD HSM
	NW 0162 56 100	10	15	50	-	110	2	12	2	371-374 A	WD HSM

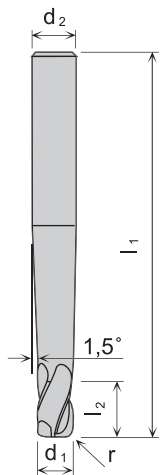
Solid carbide end mills

catalogue no.

 d_1
 l_2
 l_3
 d_3
 l_1
 r
 d_2
 z

ref. pg. arbors
ref. application
features

reinforced shank | tapered wd.



NW 0162 56 101

10

15

50

-

150

2

12

2

371-374

A

✓

WD

HSM

HSM

major application
minor application


roughing



roughing



pre-finishing



pre-finishing



finishing



finishing



CORNER RADIUS END MILLS

1 + 2 flutes f. hardened steel | CBN | spherical | w. wd.

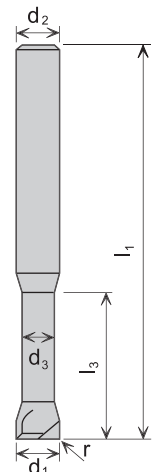
0600

1 + 2 flutes, plain shank, corner radius

- with working depth
- for hardened steel over 60 HRC

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							CBN	

Solid carbide end mills														
catalogue no.				d_1	l_2	l_3	d_3	l_1	r	d_2	z	ref. pg. arbors	ref. application	features

w. wd. CBN														
	NW 0600 10 015	1.5	-	6	1.4	50	0.2	6	1	356-360 A		WD	HSM	
	NW 0600 10 020	2	-	8	1.9	50	0.2	6	1	356-360 A		WD	HSM	
	NW 0600 10 030	3	-	10	2.9	50	0.2	6	1	356-360 A		WD	HSM	
	NW 0600 10 040	4	-	15	3.8	50	0.2	6	2	356-360 A		WD	HSM	
	NW 0600 10 050	5	-	20	4.8	75	0.2	6	2	356-360 A		WD	HSM	
	NW 0600 10 060	6	-	20	5.8	75	0.2	6	2	356-360 A		WD	HSM	
	NW 0600 10 080	8	-	35	7.8	100	0.2	8	2	361-365 A		WD	HSM	
	NW 0600 10 100	10	-	35	9.8	100	0.3	10	2	366-370 A		WD	HSM	
	NW 0600 10 120	12	-	50	-	100	0.3	10	2	366-370 A		HSM		

CORNER RADIUS END MILLS

4 flutes for steel | no wd. | stand. series

0334

4 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- without working depth
- on demand: available with working depth



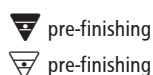
1/2 ▶

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

no wd standard series													
	NW 0334 56 02002	2	3	-	-	50	0.2	4	4	352-355 A			
	NW 0334 56 020	2	3	-	-	50	0.5	4	4	352-355 A			
	NW 0334 56 03002	3	4.5	-	-	50	0.2	4	4	352-355 A			
	NW 0334 56 03003	3	4.5	-	-	50	0.3	4	4	352-355 A			
	NW 0334 56 030	3	4.5	-	-	50	0.5	4	4	352-355 A			
	NW 0334 56 031	3	4.5	-	-	50	1	4	4	352-355 A			
	NW 0334 56 03005	3	4.5	-	-	57	0.5	6	4	356-360 A			
	NW 0334 56 04002	4	6	-	-	50	0.2	4	4	352-355 A			
	NW 0334 56 040	4	6	-	-	50	0.5	4	4	352-355 A			
	NW 0334 56 041	4	6	-	-	50	1	4	4	352-355 A			
	NW 0334 56 0401	4	6	-	-	57	0.5	6	4	356-360 A			
	NW 0334 56 05002	5	7.5	-	-	57	0.2	6	4	356-360 A			
	NW 0334 56 050	5	7.5	-	-	57	0.5	6	4	356-360 A			
	NW 0334 56 051	5	7.5	-	-	57	1	6	4	356-360 A			
	NW 0334 56 06002	6	9	-	-	57	0.2	6	4	356-360 A			
	NW 0334 56 06003	6	9	-	-	57	0.3	6	4	356-360 A			
	NW 0334 56 060	6	9	-	-	57	0.5	6	4	356-360 A			
	NW 0334 56 061	6	9	-	-	57	1	6	4	356-360 A			
	NW 0334 56 062	6	9	-	-	57	1.5	6	4	356-360 A			

major application
minor application





CORNER RADIUS END MILLS

4 flutes for steel | no wd. | stand. series

0334

4 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- without working depth
- on demand: available with working depth

2/2

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.									ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r	d_2	z				

no wd standard series												
	NW 0334 56 080	8	12	-	-	63	0.5	8	4	361-365 A		
	NW 0334 56 081	8	12	-	-	63	1	8	4	361-365 A		
	NW 0334 56 082	8	12	-	-	63	1.5	8	4	361-365 A		
	NW 0334 56 083	8	12	-	-	63	2	8	4	361-365 A		
	NW 0334 56 100	10	15	-	-	72	0.5	10	4	366-370 A		
	NW 0334 56 101	10	15	-	-	72	1	10	4	366-370 A		
	NW 0334 56 102	10	15	-	-	72	1.5	10	4	366-370 A		
	NW 0334 56 103	10	15	-	-	72	2	10	4	366-370 A		
	NW 0334 56 120	12	18	-	-	83	0.5	12	4	371-374 A		
	NW 0334 56 121	12	18	-	-	83	1	12	4	371-374 A		
	NW 0334 56 122	12	18	-	-	83	1.5	12	4	371-374 A		
	NW 0334 56 123	12	18	-	-	83	2	12	4	371-374 A		
	NW 0334 56 163	16	24	-	-	92	2	16	4	375-378 A		

CORNER RADIUS END MILLS

4 flutes for steel | w. wd. | long series

0364

4 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVTi-coated

- long series
- with working depth



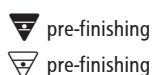
1/2 ▶

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

w. wd. long series													
	NW 0364 56 020	2	3	10	1.9	75	0.5	6	4	356-360 A			
	NW 0364 56 030	3	4.5	12	2.9	75	0.5	6	4	356-360 A			
	NW 0364 56 031	3	4.5	12	2.9	75	1	6	4	356-360 A			
	NW 0364 56 040	4	6	12	3.8	75	0.5	6	4	356-360 A			
	NW 0364 56 041	4	6	12	3.8	75	1	6	4	356-360 A			
	NW 0364 56 050	5	7.5	15	4.8	75	0.5	6	4	356-360 A			
	NW 0364 56 051	5	7.5	15	4.8	75	1	6	4	356-360 A			
	NW 0364 56 060	6	9	20	5.8	75	0.5	6	4	356-360 A			
	NW 0364 56 061	6	9	20	5.8	75	1	6	4	356-360 A			
	NW 0364 56 062	6	9	20	5.8	75	1.5	6	4	356-360 A			
	NW 0364 56 080	8	12	26	7.8	90	0.5	8	4	361-365 A			
	NW 0364 56 081	8	12	26	7.8	90	1	8	4	361-365 A			
	NW 0364 56 082	8	12	26	7.8	90	1.5	8	4	361-365 A			
	NW 0364 56 083	8	12	26	7.8	90	2	8	4	361-365 A			
	NW 0364 56 100	10	15	31	9.8	100	0.5	10	4	366-370 A			
	NW 0364 56 101	10	15	31	9.8	100	1	10	4	366-370 A			
	NW 0364 56 102	10	15	31	9.8	100	1.5	10	4	366-370 A			
	NW 0364 56 103	10	15	31	9.8	100	2	10	4	366-370 A			
	NW 0364 56 120	12	18	37	11.8	110	0.5	12	4	371-374 A			

major application
minor application



4 flutes for steel | w. wd. | long series

4 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVTi-coated

- long series
- with working depth

◀ 2/2

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features

[illegible]

CORNER RADIUS END MILLS

4 flutes f. steel | reinforced shank | tapered wd.

0164

4 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVTi-coated

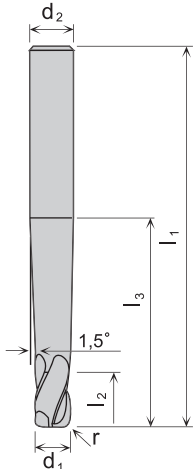
• long series

• l3: maximum working depth; 1.5° draft angle behind cutting edge



Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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reinforced shank tapered wd.														
	NW 0164 56 030	3	4.5	25	-	75	1	6	4	356-360 A				
	NW 0164 56 031	3	4.5	50	-	100	1	6	4	356-360 A				
	NW 0164 56 040	4	6	25	-	75	1	6	4	356-360 A				
	NW 0164 56 041	4	6	50	-	100	1	6	4	356-360 A				
	NW 0164 56 050	5	7.5	25	-	75	1	6	4	356-360 A				
	NW 0164 56 051	5	7.5	50	-	90	1	8	4	361-365 A				
	NW 0164 56 052	5	6	25	-	75	1.5	6	4	356-360 A				
	NW 0164 56 060	6	9	35	-	75	1	8	4	361-365 A				
	NW 0164 56 061	6	9	50	-	100	1	10	4	366-370 A				
	NW 0164 56 080	8	12	50	-	100	2	10	4	366-370 A				
	NW 0164 56 081	8	12	90	-	150	2	12	4	371-374 A				
	NW 0164 56 100	10	15	50	-	110	2	12	4	371-374 A				
	NW 0164 56 101	10	15	50	-	150	2	12	4	371-374 A				

major application
minor application

roughing
 pre-finishing

pre-finishing
 finishing

finishing
 pre-finishing



CORNER RADIUS END MILLS

2 flutes f. NF mat. | w. + no wd. | stand. + long series

0432 | 0492

2 flutes, plain shank, corner radius, centre cutting, 30° right-hand helix, PVAS-coated

- standard and long series
- with and without working depth

1/2 ▶

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVAS

Solid carbide end mills											
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z
								ref. pg. arbors			
								ref. application			
								features			

w. + no wd. | std. + long series

	NW 0432 47 021	2	2	-	-	50	0.2	4	2	352-355 A	
	NW 0432 47 02011	2	2	-	-	50	0.5	4	2	352-355 A	
	NW 0432 47 020	2	2	10	1.9	50	0.2	4	2	352-355 A	
	NW 0432 47 0201	2	2	10	1.9	50	0.5	4	2	352-355 A	
	NW 0432 47 031	3	3	-	-	50	0.2	4	2	352-355 A	
	NW 0432 47 03011	3	3	-	-	50	0.5	4	2	352-355 A	
	NW 0432 47 030	3	3	12	2.9	50	0.2	4	2	352-355 A	
	NW 0432 47 0301	3	3	12	2.9	50	0.5	4	2	352-355 A	
	NW 0432 47 041	4	4	-	-	50	0.2	4	2	352-355 A	
	NW 0432 47 04011	4	4	-	-	50	0.5	4	2	352-355 A	
	NW 0432 47 040	4	4	15	3.8	50	0.2	4	2	352-355 A	
	NW 0432 47 0401	4	4	15	3.8	50	0.5	4	2	352-355 A	
	NW 0432 47 050	5	5	21	4.8	57	0.2	6	2	356-360 A	
	NW 0432 47 0501	5	5	21	4.8	57	0.5	6	2	356-360 A	
	NW 0432 47 060	6	6	21	5.8	57	0.2	6	2	356-360 A	
	NW 0432 47 0601	6	6	21	5.8	57	0.5	6	2	356-360 A	
	NW 0432 47 0612	6	6	21	5.8	57	1	6	2	356-360 A	
	NW 0432 47 0613	6	6	30	5.8	75	1	6	2	356-360 A	
	NW 0432 47 081	8	8	27	7.8	63	0.5	8	2	361-365 A	

Solid carbide end mills

catalogue no.

 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application
features

w. + no wd. | std. + long series

	NW 0432 47 080	8	8	30	7.8	63	1	8	2	361-365 A	✓ WD NF HSM
	NW 0432 47 0805	8	8	50	7.8	90	1	8	2	361-365 A	✓ WD NF HSM
	NW 0432 47 1011	10	10	32	9.8	72	0.5	10	2	366-370 A	✓ WD NF HSM
	NW 0432 47 101	10	10	32	9.8	72	1	10	2	366-370 A	✓ WD NF HSM
	NW 0432 47 1014	10	10	40	9.8	100	1	10	2	366-370 A	✓ NEW WD NF HSM
	NW 0432 47 1016	10	10	60	9.8	100	1	10	2	366-370 A	✓ NEW WD NF HSM
	NW 0432 47 100	10	10	32	9.8	72	1.5	10	2	366-370 A	✓ WD NF HSM
	NW 0432 47 1201	12	12	38	11.8	83	0.5	12	2	371-374 A	✓ WD NF HSM
	NW 0432 47 120	12	12	38	11.8	83	1.5	12	2	371-374 A	✓ WD NF HSM
	NW 0432 47 1206	12	12	60	11.8	110	1.5	12	2	371-374 A	✓ NEW WD NF HSM
	NW 0432 47 1208	12	12	80	11.8	110	1.5	12	2	371-374 A	✓ NEW WD NF HSM
	NW 0432 47 1615	16	16	50	15.8	92	1.5	16	2	375-378 A	✓ NEW WD NF HSM
	NW 0432 47 1619	16	16	100	15.8	150	1.5	16	2	375-378 A	✓ NEW WD NF HSM
	NW 0432 47 160	16	16	44	15.8	92	2	16	2	375-378 A	✓ WD NF HSM
	NW 0432 47 2009	20	20	100	19.8	150	1.5	20	2	379-381 A	✓ NEW WD NF HSM
	NW 0432 47 200	20	20	54	19.8	104	2	20	2	379-381 A	⚠ WD NF HSM

no wd. | long series

	NW 0492 47 060	6	20	-	-	100	1	6	2	356-360 A	✓ EX NF HSM
	NW 0492 47 080	8	25	-	-	100	1	8	2	361-365 A	✓ EX NF HSM
	NW 0492 47 100	10	25	-	-	100	1.5	10	2	366-370 A	✓ EX NF HSM
	NW 0492 47 121	12	30	-	-	150	1.5	12	2	371-374 A	✓ EX NF HSM

major application
minor application
 roughing
 pre-finishing

 pre-finishing
 finishing

 finishing
 finishing



CORNER RADIUS END MILLS

2 fl. f. NF mat.+high-temp alloys | w.+no wd. | stand. series

0462

2 flutes, plain shank, corner radius, centre cutting, 30° right-hand helix, PVCN-coated

- standard series
- available with extra-small corner radii
- with and without working depth
- new coatings

1/2 ▶

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVCN

Solid carbide end mills	catalogue no.									ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z				

no wd. standard series														
	NWV 0462 43 011	1	1	-	-	50	0.2	4	2	352-355 A		NEW	NF	HSM
	NWV 0462 43 010	1	1	10	0.95	50	0.2	4	2	352-355 A		WD	NF	HSM
	NWV 0462 43 0151	1.5	1.5	-	-	50	0.2	4	2	352-355 A		NEW	NF	HSM
	NWV 0462 43 015	1.5	1.5	10	1.4	50	0.2	4	2	352-355 A		WD	NF	HSM
	NWV 0462 43 021	2	2	-	-	50	0.2	4	2	352-355 A		NEW	NF	HSM
	NWV 0462 43 020	2	2	10	1.9	50	0.2	4	2	352-355 A		WD	NF	HSM
	NWV 0462 43 02105	2	2	-	-	50	0.5	4	2	352-355 A		NEW	NF	HSM
	NWV 0462 43 02005	2	2	10	1.9	50	0.5	4	2	352-355 A		WD	NF	HSM
	NWV 0462 43 031	3	3	-	-	50	0.2	4	2	352-355 A		NEW	NF	HSM
	NWV 0462 43 030	3	3	12	2.9	50	0.2	4	2	352-355 A		WD	NF	HSM
	NWV 0462 43 03105	3	3	-	-	50	0.5	4	2	352-355 A		NEW	NF	HSM
	NWV 0462 43 03005	3	3	12	2.9	50	0.5	4	2	352-355 A		WD	NF	HSM
	NWV 0462 43 041	4	4	-	-	50	0.2	4	2	352-355 A		NEW	NF	HSM
	NWV 0462 43 040	4	4	15	3.8	50	0.2	4	2	352-355 A		WD	NF	HSM
	NWV 0462 43 04105	4	4	-	-	50	0.5	4	2	352-355 A		NEW	NF	HSM
	NWV 0462 43 04005	4	4	15	3.8	50	0.5	4	2	352-355 A		WD	NF	HSM
	NWV 0462 43 051	5	5	-	-	57	0.2	6	2	356-360 A		NEW	NF	HSM
	NWV 0462 43 050	5	5	21	4.8	57	0.2	6	2	356-360 A		WD	NF	HSM
	NWV 0462 43 05105	5	5	-	-	57	0.5	6	2	356-360 A		NEW	NF	HSM

Solid carbide end mills

catalogue no.

 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application
features

no wd. | standard series

	NW 0462 43 05005	5	5	21	4.8	57	0.5	6	2	356-360 A	✓ WD NF HSM
	NW 0462 43 06105	6	6	-	-	57	0.5	6	2	356-360 A	✓ NEW NF HSM
	NW 0462 43 06005	6	6	21	5.8	57	0.5	6	2	356-360 A	✓ WD NF HSM
	NW 0462 43 061	6	6	-	-	57	0.7	6	2	356-360 A	✓ NEW NF HSM
	NW 0462 43 060	6	6	21	5.8	57	0.7	6	2	356-360 A	✓ WD NF HSM
	NW 0462 43 06110	6	6	-	-	57	1	6	2	356-360 A	✓ NEW NF HSM
	NW 0462 43 06010	6	6	21	5.8	57	1	6	2	356-360 A	✓ WD NF HSM
	NW 0462 43 0811	8	8	-	-	63	0.5	8	2	361-365 A	✓ NEW NF HSM
	NW 0462 43 0801	8	8	27	7.8	63	0.5	8	2	361-365 A	✓ WD NF HSM
	NW 0462 43 081	8	8	-	-	63	0.7	8	2	361-365 A	✓ NEW NF HSM
	NW 0462 43 080	8	8	27	7.8	63	0.7	8	2	361-365 A	✓ WD NF HSM
	NW 0462 43 0812	8	8	-	-	63	1	8	2	361-365 A	✓ NEW NF HSM
	NW 0462 43 0802	8	8	27	7.8	63	1	8	2	361-365 A	✓ WD NF HSM
	NW 0462 43 101	10	10	-	-	72	0.7	10	2	366-370 A	✓ NEW NF HSM
	NW 0462 43 100	10	10	32	9.8	72	0.7	10	2	366-370 A	✓ WD NF HSM
	NW 0462 43 1102	10	10	-	-	72	1	10	2	366-370 A	✓ NEW NF HSM
	NW 0462 43 1002	10	10	32	9.8	72	1	10	2	366-370 A	✓ WD NF HSM
	NW 0462 43 121	12	12	-	-	83	0.7	12	2	371-374 A	✓ NEW NF HSM
	NW 0462 43 120	12	12	38	11.8	83	0.7	12	2	371-374 A	✓ WD NF HSM
	NW 0462 43 1213	12	12	-	-	83	1.5	12	2	371-374 A	✓ NEW NF HSM
	NW 0462 43 1203	12	12	38	11.8	83	1.5	12	2	371-374 A	✓ WD NF HSM
	NW 0462 43 161	16	16	-	-	92	0.7	16	2	375-378 A	✓ NEW NF HSM
	NW 0462 43 160	16	16	44	15.8	92	0.7	16	2	375-378 A	✓ WD NF HSM
	NW 0462 43 201	20	20	-	-	104	0.7	20	2	379-381 A	△ NEW NF HSM
	NW 0462 43 200	20	20	54	19.8	104	0.7	20	2	379-381 A	✓ WD NF HSM

major application
minor applicationroughing
roughingpre-finishing
pre-finishingfinishing
finishing



CORNER RADIUS END MILLS

2 flutes for non-ferr. mat. | PCD | spherical | w. wd.

0600

2 flutes, plain shank, corner radius, centre cutting

- with working depth
- for non-ferr. material

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							PCD	

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r	d_2	z					

w. wd. PCD													
	NW 0600 20 020	2	-	5	1.9	50	0.2	6	1	356-360 A			
	NW 0600 20 040	4	-	15	3.8	50	0.2	6	2	356-360 A			
	NW 0600 20 050	5	-	20	4.8	75	0.2	6	2	356-360 A			
	NW 0600 20 060	6	-	30	5.8	75	0.2	6	2	356-360 A			
	NW 0600 20 080	8	-	35	7.8	100	0.2	8	2	361-365 A			
	NW 0600 20 100	10	-	35	9.8	100	0.3	10	2	366-370 A			
	NW 0600 20 120	12	-	50	-	100	0.3	10	2	366-370 A			

CORNER RADIUS END MILLS

2 flutes f. graphite | finishing

0452

2 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVDiaG+N-coated

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: For graphite machining only**



1/3 ▶

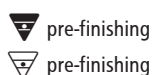
Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbor	ref. application	features
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w. + no wd. | std. + long series

	SVV 0452 48 00403	0.4	0.6	2.5	0.37	50	0.05	4	2	352-355 A	WD
	SVV 0452 48 00404	0.4	0.6	5	0.37	50	0.05	4	2	352-355 A	WD
	NVV 0452 48 0050	0.5	0.8	-	-	50	0.05	4	2	352-355 A	
	SVV 0452 48 00503	0.5	0.8	3.5	0.45	50	0.05	4	2	352-355 A	WD
	NVV 0452 48 0051	0.5	0.8	5	0.45	50	0.05	4	2	352-355 A	WD
	SVV 0452 48 00504	0.5	0.8	7	0.45	50	0.05	4	2	352-355 A	WD
	NVV 0452 48 0052	0.5	0.8	10	0.45	50	0.05	4	2	352-355 A	WD
	SVV 0452 48 00603	0.6	0.9	3.5	0.55	50	0.05	4	2	352-355 A	WD
	SVV 0452 48 00604	0.6	0.9	7	0.55	50	0.05	4	2	352-355 A	WD
	NVV 0452 48 008	0.8	2	-	-	39	-	3	2	350-351 A	
	SVV 0452 48 00803	0.8	1.2	5	0.75	50	0.05	4	2	352-355 A	WD
	SVV 0452 48 00804	0.8	1.2	10	0.75	50	0.05	4	2	352-355 A	WD
	NVV 0452 48 010	1	3	-	-	39	-	3	2	350-351 A	
	SVV 0452 48 0103	1	1.5	5	0.95	50	0.05	4	2	352-355 A	WD
	SVV 0452 48 0104	1	1.5	10	0.95	50	0.05	4	2	352-355 A	WD
	SVV 0452 48 010	1	1.5	-	-	50	0.1	4	2	352-355 A	WD
	NVV 0452 48 01000	1	1.5	5	0.95	50	0.1	4	2	352-355 A	WD
	NVV 0452 48 01010	1	1.5	10	0.95	50	0.1	4	2	352-355 A	WD
	NVV 0452 48 01011	1	1.5	20	0.95	75	0.1	4	2	352-355 A	WD

major application
minor application





CORNER RADIUS END MILLS

2 flutes f. graphite | finishing

0452

2 flutes, plain shank, corner radius, centre cutting, 30° right hand helix, PVDiaG+N-coated

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: For graphite machining only**

2/3

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills	catalogue no.									ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z				

w. + no wd. | std. + long series

	NVV 0452 48 01020	1	1.5	10	0.95	50	0.2	4	2	352-355 A			
	NVV 0452 48 0102	1	1.5	15	0.95	50	0.2	4	2	352-355 A			
	SVV 0452 48 0152	1.5	2.3	10	1.4	50	0.1	4	2	352-355 A			
	NVV 0452 48 0151	1.5	2.3	-	-	50	0.15	4	2	352-355 A			
	NVV 0452 48 0152	1.5	2.3	10	1.4	50	0.15	4	2	352-355 A			
	NVV 0452 48 01521	1.5	2.3	15	1.4	50	0.15	4	2	352-355 A			
	SVV 0452 48 01521	1.5	2.3	10	1.4	50	0.2	4	2	352-355 A			
	NVV 0452 48 01520	1.5	2.3	15	1.4	50	0.2	4	2	352-355 A			
	SVV 0452 48 0154	1.5	2.3	25	1.4	75	0.2	4	2	352-355 A			
	SVV 0452 48 0202	2	3	10	1.9	50	0.1	4	2	352-355 A			
	NVV 0452 48 0200	2	3	-	-	50	0.2	4	2	352-355 A			
	NVV 0452 48 0201	2	3	5	1.9	50	0.2	4	2	352-355 A			
	NVV 0452 48 0202	2	3	10	1.9	50	0.2	4	2	352-355 A			
	NVV 0452 48 0203	2	3	15	1.9	50	0.2	4	2	352-355 A			
	NVV 0452 48 0204	2	3	20	1.9	75	0.2	4	2	352-355 A			
	NVV 0452 48 0205	2	3	25	1.9	75	0.2	4	2	352-355 A			
	NVV 0452 48 021	2	3	10	1.9	50	0.3	4	2	352-355 A			
	NVV 0452 48 0214	2	3	20	1.9	75	0.3	4	2	352-355 A			
	NVV 0452 48 0301	3	4.5	15	2.9	75	0.2	4	2	352-355 A			

catalogue no.

 d_1 I_2
$$I_3$$
 d_3

1

 r d_2
$$Z$$

ref. pg. arbors
ref. application
fe

features

NW 0452 48 052

NW 0452 48 052

5

7.5

45

4.8

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3	
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385

A





CORNER RADIUS END MILLS

3 fl. f. graphite | pre-finishing + roughing | w. + no wd. |
std.+long

0453

3 flutes, plain shank, corner radius, centre cutting, 30° and 40° right hand helix

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: for graphite machining only**

1/4 ▶

Material Classification								Carbide Grade	Coating
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel			
A					⚠		KAC	PVDiaN	

Solid carbide end mills									
catalogue no.									ref. pg. arbors ref. application features
		d_1	l_2	l_3	d_3	l_1	r	d_2	z

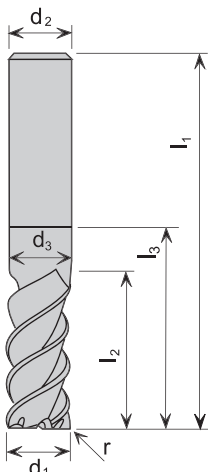
w. + no wd. std. + long series										
	SVW 0453 48 0306	3	4.5	10	2.9	50	0.1	4	3	352-355 A ✓ [WD] [NF] [HSM]
	SVW 0453 48 03031	3	4.5	15	2.9	50	0.2	4	3	352-355 A ✓ [WD] [NF] [HSM]
	SVW 0453 48 03052	3	4.5	25	2.9	75	0.2	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0300	3	4.5	-	-	50	0.3	4	3	352-355 A ✓ [NF] [HSM]
	NVW 0453 48 031	3	30	-	-	100	0.3	4	3	352-355 A ⚠ [NF]
	NVW 0453 48 0302	3	4.5	10	2.9	50	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0303	3	4.5	15	2.9	50	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0304	3	4.5	20	2.9	75	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0305	3	4.5	25	2.9	75	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	SVW 0453 48 0417	4	6	15	3.8	75	0.2	4	3	352-355 A ✓ [WD] [NF] [HSM]
	SVW 0453 48 04053	4	6	25	3.8	75	0.2	4	3	352-355 A ✓ [WD] [NF] [HSM]
	SVW 0453 48 04061	4	6	45	3.8	100	0.2	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0400	4	6	-	-	50	0.3	4	3	352-355 A ⚠ [NF] [HSM]
	NVW 0453 48 0402	4	6	10	3.8	50	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0403	4	6	15	3.8	50	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0404	4	6	20	3.8	75	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0405	4	6	25	3.8	75	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 0406	4	6	45	3.8	100	0.3	4	3	352-355 A ✓ [WD] [NF] [HSM]
	NVW 0453 48 04020	4	6	10	3.8	50	0.5	4	3	352-355 A ✓ [NEW] [WD] [NF] [HSM]

Solid carbide end mills

catalogue no.

 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application
features

w. + no wd. | std. + long series

	NVW 0453 48 04001	4	6	-	-	50	1	4	3	352-355 A	 
	NVW 0453 48 04021	4	6	10	3.8	50	1	4	3	352-355 A	  
	NVW 0453 48 04031	4	6	15	3.8	50	1	4	3	352-355 A	  
	NVW 0453 48 04041	4	6	20	3.8	75	1	4	3	352-355 A	  
	NVW 0453 48 04051	4	6	25	3.8	75	1	4	3	352-355 A	  
	NVW 0453 48 04061	4	6	45	3.8	100	1	4	3	352-355 A	  
	NVW 0453 48 050	5	35	-	-	75	0.3	5	3	385 A	
	NVW 0453 48 051	5	40	-	-	100	0.3	5	3	385 A	
	NVW 0453 48 0502	5	7.5	10	4.8	57	0.3	5	3	385 A	  
	NVW 0453 48 0503	5	7.5	20	4.8	75	0.3	5	3	385 A	  
	NVW 0453 48 0504	5	7.5	45	4.8	100	0.3	5	3	385 A	  
	NVW 0453 48 067	6	50	-	-	150	0.2	6	3	356-360 A	
	SVW 0453 48 06052	6	9	25	5.8	75	0.2	6	3	356-360 A	  
	SVW 0453 48 06072	6	9	45	5.8	100	0.2	6	3	356-360 A	  
	NVW 0453 48 0600	6	9	-	-	57	0.3	6	3	356-360 A	 
	NVW 0453 48 060	6	60	-	-	150	0.3	6	3	356-360 A	
	NVW 0453 48 0603	6	9	15	5.8	57	0.3	6	3	356-360 A	  
	NVW 0453 48 0604	6	9	20	5.8	75	0.3	6	3	356-360 A	  
	NVW 0453 48 0605	6	9	25	5.8	75	0.3	6	3	356-360 A	  
	NVW 0453 48 0606	6	9	30	5.8	75	0.3	6	3	356-360 A	  
	NVW 0453 48 0607	6	9	45	5.8	100	0.3	6	3	356-360 A	  
	NVW 0453 48 0608	6	9	60	5.8	150	0.3	6	3	356-360 A	  
	NVW 0453 48 06030	6	9	15	5.8	57	0.5	6	3	356-360 A	   
	SVW 0453 48 06053	6	9	25	5.8	75	0.7	6	3	356-360 A	  
	SVW 0453 48 06073	6	9	45	5.8	100	0.7	6	3	356-360 A	  
	NVW 0453 48 06001	6	9	-	-	57	1	6	3	356-360 A	 
	NVW 0453 48 06031	6	9	15	5.8	57	1	6	3	356-360 A	  
	NVW 0453 48 06041	6	9	20	5.8	75	1	6	3	356-360 A	  
	NVW 0453 48 06051	6	9	25	5.8	75	1	6	3	356-360 A	 
	NVW 0453 48 06061	6	9	30	5.8	75	1	6	3	356-360 A	  

major application
minor applicationroughing
roughingpre-finishing
pre-finishingfinishing
finishing



CORNER RADIUS END MILLS

3 fl. f. graphite | pre-finishing + roughing | w. + no wd. |
std.+long

0453

3 flutes, plain shank, corner radius, centre cutting, 30° and 40° right hand helix

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: for graphite machining only**

3/4

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills	catalogue no.								ref. pg. arbors		ref. application		features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

w. + no wd. | std. + long series

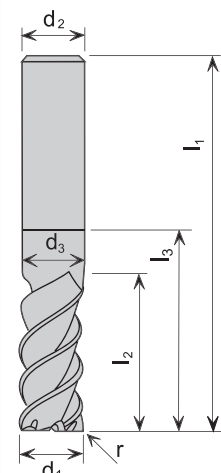
	NVV 0453 48 06071	6	9	45	5.8	100	1	6	3	356-360 A			
	NVV 0453 48 06081	6	9	60	5.8	150	1	6	3	356-360 A			
	SVV 0453 48 0808	8	12	32	7.8	75	0.3	8	3	361-365 A			
	NVV 0453 48 0800	8	12	-	-	63	0.5	8	3	361-365 A			
	NVV 0453 48 0801	8	12	20	7.8	63	0.5	8	3	361-365 A			
	NVV 0453 48 0810	8	12	45	7.8	100	0.5	8	3	361-365 A			
	NVV 0453 48 0820	8	12	60	7.8	150	0.5	8	3	361-365 A			
	SVV 0453 48 08081	8	12	32	7.8	100	0.7	8	3	361-365 A			
	SVV 0453 48 0808102	8	12	45	7.8	100	0.7	8	3	361-365 A			
	NVV 0453 48 08001	8	12	-	-	63	1	8	3	361-365 A			
	NVV 0453 48 083	8	20	-	-	75	1	8	3	361-365 A			
	NVV 0453 48 08011	8	12	20	7.8	63	1	8	3	361-365 A			
	NVV 0453 48 08101	8	12	45	7.8	100	1	8	3	361-365 A			
	NVV 0453 48 08201	8	12	60	7.8	150	1	8	3	361-365 A			
	NVV 0453 48 1000	10	15	-	-	72	0.5	10	3	366-370 A			
	NVV 0453 48 1009	10	15	25	9.8	100	0.5	10	3	366-370 A			
	NVV 0453 48 1010	10	15	45	9.8	100	0.5	10	3	366-370 A			
	NVV 0453 48 102	10	15	60	9.8	150	0.5	10	3	366-370 A			
	SVV 0453 48 10091	10	15	25	9.8	100	0.7	10	3	366-370 A			

Solid carbide end mills

catalogue no.

 d_1 l_2 l_3 d_3 l_1 r d_2 z ref. pg. arbors
ref. application
features

w. + no wd. | std. + long series

	SVV 0453 48 10102	10	15	45	9.8	100	0.7	10	3	366-370 A	✓ WD NF HSM
	NVV 0453 48 1001	10	15	-	-	72	1	10	3	366-370 A	✓ NF HSM
	NVV 0453 48 1002	10	15	25	9.8	100	1	10	3	366-370 A	✓ WD NF HSM
	NVV 0453 48 1011	10	15	45	9.8	100	1	10	3	366-370 A	✓ WD NF HSM
	NVV 0453 48 1021	10	15	60	9.8	150	1	10	3	366-370 A	✓ WD NF HSM
	NVV 0453 48 1200	12	18	-	-	83	0.5	12	3	371-374 A	✓ NF HSM
	NVV 0453 48 1209	12	18	25	11.8	83	0.5	12	3	371-374 A	✓ WD NF HSM
	NVV 0453 48 1210	12	18	45	11.8	100	0.5	12	3	371-374 A	✓ WD NF HSM
	NVV 0453 48 1220	12	18	60	11.8	150	0.5	12	3	371-374 A	✓ WD NF HSM
	NVV 0453 48 12091	12	18	25	11.8	83	0.7	12	3	371-374 A	✓ WD NF HSM
	NVV 0453 48 1201	12	18	-	-	83	1	12	3	371-374 A	✓ NF HSM
	NVV 0453 48 1202	12	18	25	11.8	83	1	12	3	371-374 A	✓ WD NF HSM
	NVV 0453 48 1211	12	18	45	11.8	100	1	12	3	371-374 A	✓ WD NF HSM
	NVV 0453 48 1221	12	18	60	11.8	150	1	12	3	371-374 A	✓ WD NF HSM
	NVV 0453 48 160	16	24	-	-	92	1	16	3	375-378 A	✓ NF HSM
	NVV 0453 48 1610	16	24	45	15.8	100	1	16	3	375-378 A	✓ WD NF HSM
	NVV 0453 48 162	16	24	60	15.8	150	1	16	3	375-378 A	✓ WD NF HSM
	NVV 0453 48 200	20	30	45	19.8	100	1	20	3	379-381 A	✓ WD NF HSM
	NVV 0453 48 201	20	30	60	19.8	150	1	20	3	379-381 A	✓ WD NF HSM

major application
minor application
 roughing
 pre-finishing

 pre-finishing
 pre-finishing

 finishing
 finishing



CORNER RADIUS END MILLS

4 flutes for graphite | finishing | w. + no wd | std + long series

0454

4 flutes, plain shank, corner radius, centre cutting, 30° right hand helix

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: for graphite machining only**

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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w. + no wd. std. + long series												
	NV 0454 48 0405	4	6	25	3.8	75	1	4	4	352-355 A	☒ WD	☒ HSM
	NV 0454 48 04051	4	6	25	-	75	1	4	4	352-355 A	☒ WD	☒ HSM
	NV 0454 48 06061	6	9	30	5.8	75	1	6	4	356-360 A	☒ WD	☒ HSM
	NV 0454 48 06071	6	9	45	5.8	100	1	6	4	356-360 A	☒ WD	☒ HSM
	NV 0454 48 08011	8	12	20	7.8	63	1	8	4	361-365 A	☒ WD	☒ HSM
	NV 0454 48 08101	8	12	45	7.8	100	1	8	4	361-365 A	☒ WD	☒ HSM
	NV 0454 48 08201	8	12	60	7.8	150	1	8	4	361-365 A	☒ WD	☒ HSM
	NV 0454 48 1001	10	15	-	-	72	1	10	4	366-370 A	☒ HSM	
	NV 0454 48 1002	10	15	25	9.8	100	1	10	4	366-370 A	☒ WD	☒ HSM
	NV 0454 48 1202	12	18	25	11.8	83	1	12	4	371-374 A	☒ WD	☒ HSM
	NV 0454 48 1211	12	18	45	11.8	100	1	12	4	371-374 A	☒ WD	☒ HSM
	NV 0454 48 1221	12	18	60	11.8	150	1	12	4	371-374 A	☒ WD	☒ HSM

TORIC END MILLS FGT

2 flutes f. copper, graphite, non-ferr. mat. + titan | wd.

0442

2 flutes, plain shank, toric, 30° right hand helix, PVDiaG-coated

- standard series
- with working depth
- modified diamond-coating

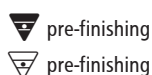


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaG

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

w. wd. standard series													
	NVV 0442 49 0082	0.8	0.8	5	0.78	50	0.1	4	2	352-355 A			
	NVV 0442 49 0101	1	1	5	0.98	50	0.2	4	2	352-355 A			
	NVV 0442 49 0151	1.5	1.5	5	1.45	50	0.2	4	2	352-355 A			
	NVV 0442 49 0201	2	2	10	1.95	50	0.2	4	2	352-355 A			
	NVV 0442 49 0301	3	3	10	2.95	57	0.2	4	2	352-355 A			
	NVV 0442 49 0401	4	4	20	3.9	57	0.2	4	2	352-355 A			
	NVV 0442 49 0501	5	5	20	4.9	57	0.3	6	2	356-360 A			
	NVV 0442 49 0601	6	6	20	5.85	57	0.5	6	2	356-360 A			
	NVV 0442 49 0800	8	8	20	7.85	63	0.5	8	2	361-365 A			
	NVV 0442 49 1000	10	10	20	9.85	72	0.5	10	2	366-370 A			
	NVV 0442 49 1215	12	12	25	11.85	83	1.5	12	2	371-374 A			

major application
minor application





TORIC END MILLS

2 flutes f. steel | no wd. | stand. series

0172

2 flutes, plain shank, toric, 30° right hand helix, PVTi-coated

- standard series
- without working depth
- for perfect surface finish
- great time-saver because ae can be increased up to 3x ap
- new geometries

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

no wd. standard series													
	NW 0172 56 020	2	3	-	-	57	0.6	6	2	356-360 A			
	NW 0172 56 025	2.5	4	-	-	57	1	6	2	356-360 A			
	NW 0172 56 030	3	4.5	-	-	57	1	6	2	356-360 A			
	NW 0172 56 040	4	6	-	-	57	1.5	6	2	356-360 A			
	NW 0172 56 050	5	7.5	-	-	57	1.5	6	2	356-360 A			
	NW 0172 56 060	6	9	-	-	57	2	6	2	356-360 A			
	NW 0172 56 061	6	9	-	-	57	2.5	6	2	356-360 A			
	NW 0172 56 080	8	12	-	-	63	2.5	8	2	361-365 A			
	NW 0172 56 081	8	12	-	-	63	3	8	2	361-365 A			
	NW 0172 57 081	8	16	-	-	63	3	8	2	361-365 A			
	NW 0172 56 100	10	15	-	-	72	2.5	10	2	366-370 A			
	NW 0172 56 101	10	15	-	-	72	3	10	2	366-370 A			
	NW 0172 56 103	10	15	-	-	72	4	10	2	366-370 A			
	NW 0172 56 121	12	18	-	-	83	3	12	2	371-374 A			
	NW 0172 56 123	12	18	-	-	83	4	12	2	371-374 A			
	NW 0172 56 124	12	18	-	-	83	5	12	2	371-374 A			

TORIC END MILLS

2 flutes f. steel | w. wd. | long series

0182

2 flutes, plain shank, toric, 30° right hand helix, PVTi-coated

- long series
- with working depth
- for perfect surface finish
- great time-saver because ae can be increased up to 3x ap
- new geometries

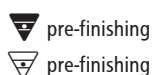


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

w. wd. long series													
	NW 0182 56 060	6	9	20	5.8	75	2	6	2	356-360 A			
	NW 0182 56 061	6	9	20	5.8	75	2.5	6	2	356-360 A			
	NW 0182 56 080	8	12	26	7.8	90	2.5	8	2	361-365 A			
	NW 0182 56 081	8	12	26	7.8	90	3	8	2	361-365 A			
	NW 0182 56 100	10	15	31	9.8	100	2.5	10	2	366-370 A			
	NW 0182 56 101	10	15	31	9.8	100	3	10	2	366-370 A			
	NW 0182 56 103	10	15	31	9.8	100	4	10	2	366-370 A			
	NW 0182 56 123	12	18	37	11.8	110	4	12	2	371-374 A			
	NW 0182 56 124	12	18	37	11.8	110	5	12	2	371-374 A			

major application
minor application





TORIC END MILLS

3 fl. f. cast iron, steel + non-ferr. mat. | no wd. | stand.

0163

3 flutes, plain shank, toric, 30° right hand helix, PVCC-coated

- standard series
- for perfect surface finish
- great time-saver because ae can be increased up to 3x ap
- new geometries

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVCC

Solid carbide end mills															
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg.	arbors	ref. application	features

no wd. standard series														
	NW 0163 57 060	6	12	-	-	57	2.5	6	3	356-360 A				
	NW 0163 57 080	8	16	-	-	63	3	8	3	361-365 A				
	NW 0163 57 100	10	20	-	-	72	4	10	3	366-370 A				
	NW 0163 57 120	12	24	-	-	83	5	12	3	371-374 A				
	NW 0163 57 160	16	24	-	-	92	7	16	3	375-378 A				

TORIC END MILLS

3 fl. f. cast iron, steel + non-ferr. mat. | w. wd. | long

0183

3 flutes, plain shank, toric, 30° right hand helix, PVCC-coated

- long series
- for perfect surface finish
- great time-saver because ae can be increased up to 3x ap
- new geometries

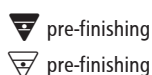


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVCC

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

w. wd. long series													
	NW 0183 57 060	6	12	20	5.8	75	2	6	3	356-360 A			
	NW 0183 57 061	6	12	20	5.8	75	2.5	6	3	356-360 A			
	NW 0183 57 080	8	16	26	7.8	90	2.5	8	3	361-365 A			
	NW 0183 57 081	8	16	26	7.8	90	3	8	3	361-365 A			
	NW 0183 57 100	10	20	31	9.8	100	2.5	10	3	366-370 A			
	NW 0183 57 101	10	20	31	9.8	100	3	10	3	366-370 A			
	NW 0183 57 103	10	20	31	9.8	100	4	10	3	366-370 A			
	NW 0183 57 120	12	24	37	11.8	110	2.5	12	3	371-374 A			
	NW 0183 57 123	12	24	37	11.8	110	4	12	3	371-374 A			
	NW 0183 57 124	12	24	37	11.8	110	5	12	3	371-374 A			

major application
minor application





TORIC END MILLS

5 flutes f. hardened steel | w. wd. | stand. series

0275

5 flutes, plain shank, toric, PVAT-coated

- standard series
- extremely stable core diameter
- new ultramicrograin carbide
- optimized geometry

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVAT

Solid carbide end mills															
catalogue no.				d_1	l_2	l_3	d_3	l_1	r	d_2	z	ref. pg.	arbors	ref. application	features

no wd. standard series														
	NW 0275 59 060	6	4.5	-	-	57	2	6	5	356-360 A				
	NW 0275 59 080	8	5.5	-	-	63	2.5	8	5	361-365 A				
	NW 0275 59 101	10	7.5	-	-	72	3	10	5	366-370 A				
	NW 0275 59 100	10	7.5	-	-	72	3.5	10	5	366-370 A				
	NW 0275 59 120	12	9	-	-	83	3.5	12	5	371-374 A				
	NW 0275 59 160	16	10.5	-	-	92	5	16	5	375-378 A				

TORIC END MILLS

2 flutes f. steel | spherical | wd.

1362

2 flutes, plain shank, toric, straight flutes, PVTi-coated

- with working depth
- for plunging and lifting an 90° walls

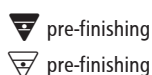


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

spherical w. wd.													
	NW 1362 56 020	2	2	8	1.9	75	0.5	6	2	356-360 A			
	NW 1362 56 030	3	3	12	2.9	75	0.75	6	2	356-360 A			
	NW 1362 56 040	4	4	16	3.8	75	1	6	2	356-360 A			
	NW 1362 56 050	5	5	20	4.8	100	1.25	6	2	356-360 A			
	NW 1362 56 060	6	6	24	5.8	100	1.5	6	2	356-360 A			
	NW 1362 56 080	8	8	32	7.8	100	2	8	2	361-365 A			
	NW 1362 56 100	10	10	40	9.8	125	2.5	10	2	366-370 A			
	NW 1362 56 120	12	12	48	11.8	125	3	12	2	371-374 A			
	NW 1362 56 160	16	16	56	15.8	165	4	16	2	375-378 A			

major application
minor application





TORIC END MILLS

2 flutes f. hardened steel | CBN | spherical | wd.

0610

2-3 flutes, plain shank, toric

- with working depth
- for plunging and lifting on 90° walls
- for hardened steel over 60 HRC

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A				▽		▽	CBN	

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

spherical w. wd.													
	NW 0610 10 040	4	-	15	3.8	50	1	6	2	356-360 A	?	WD	HSM
	NW 0610 10 050	5	-	20	4.8	75	1.25	6	2	356-360 A	?	WD	HSM
	NW 0610 10 060	6	-	20	5.8	75	1.5	6	2	356-360 A	?	WD	HSM
	NW 0610 10 080	8	-	35	7.8	100	2	8	2	361-365 A	?	WD	HSM
	NW 0610 10 100	10	-	35	9.8	100	2.5	10	2	366-370 A	?	WD	HSM
	NW 0610 10 120	12	-	50	-	100	3	10	2	366-370 A	?		HSM

TORIC END MILLS

2 + 3 flutes f. hardened steel | CBN | spherical | wd.

093

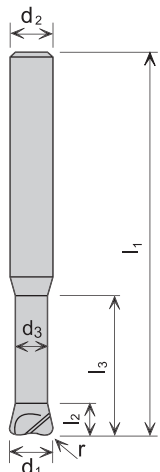
2-3 flutes, plain shank, toric

- with working depth
- for plunging and lifting on 90° walls
- for hardened steel over 60 HRC

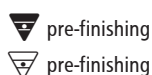


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A				▽		▽	CBN	

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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spherical w. wd.	60 04 093	4	3.5	11.5	3.5	60	1.5	6	2	356-360 A	△ WD HSM
	60 05 093	5	4.2	11.9	4.6	60	1.5	6	2	356-360 A	△ WD HSM
	60 06 093	6	4	19.7	4.9	60	1.5	6	2	356-360 A	△ WD HSM
	60 08 093	8	5	19.8	6.5	60	2.5	8	2	361-365 A	△ WD HSM
	80 10 093	10	5.8	19.8	8.5	80	2.5	10	2	366-370 A	△ WD HSM
	80 12 093	12	6.5	19.8	10.5	80	2.5	10	2	366-370 A	△ HSM

major application
minor application





TORIC END MILLS

2 flutes for non-ferr. mat. | no wd. | stand. series

0442

2 flutes, plain shank, toric, 30° right hand helix, PVAS-coated

- standard series
- on demand: available with working depth

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVAS

Solid carbide end mills													
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application
												features	

no wd. standard series													
	NW 0442 47 004	0.4	1	-	-	50	0.12	4	2	352-355 A			
	NW 0442 47 006	0.6	1	-	-	50	0.2	4	2	352-355 A			
	NW 0442 47 008	0.8	1.2	-	-	50	0.25	4	2	352-355 A			
	NW 0442 47 010	1	1.5	-	-	50	0.3	4	2	352-355 A			
	NW 0442 47 015	1.5	2.3	-	-	50	0.3	4	2	352-355 A			
	NW 0442 47 020	2	3	-	-	50	0.5	4	2	352-355 A			
	NW 0442 47 030	3	4	-	-	50	0.5	4	2	352-355 A			
	NW 0442 47 040	4	6	-	-	50	0.5	4	2	352-355 A			
	NW 0442 47 050	5	7	-	-	57	1	6	2	356-360 A			
	NW 0442 47 060	6	8	-	-	57	1	6	2	356-360 A			
	NW 0442 47 080	8	10	-	-	63	1.5	8	2	361-365 A			
	NW 0442 47 100	10	12	-	-	72	2	10	2	366-370 A			
	NW 0442 47 120	12	15	-	-	83	2.5	12	2	371-374 A			
	NW 0442 47 160	16	18	-	-	92	3	16	2	375-378 A			

TORIC END MILLS

2 flutes for non-ferr. mat. | no wd. | stand. + long

0482

2 flutes, plain shank, toric, PVTi-coated

- standard and long series
- perfect surface finish
- great time-saver because ae can be increased up to 3 x ap
- new geometries

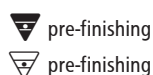


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

no wd. long series													
	NW 0482 40 061	6	20	-	-	80	2.5	6	2	356-360 A			
	NW 0482 40 081	8	25	-	-	80	3	8	2	361-365 A			
	NW 0482 40 082	8	25	-	-	120	3	8	2	361-365 A			
	NW 0482 40 101	10	28	-	-	80	4	10	2	366-370 A			
	NW 0482 40 102	10	28	-	-	120	4	10	2	366-370 A			
	NW 0482 40 121	12	28	-	-	80	5	12	2	371-374 A			
	NW 0482 40 122	12	28	-	-	120	5	12	2	371-374 A			

major application
minor application





END MILLS

2 flutes for steel | Mini | no wd.

0142

2 flutes, plain shank, straight face, 30° right hand helix, PVTi-coated

- 3 mm shank diam.
- standard series
- without working depth
- without chamfer

1/2 ▶

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills

Solid carbide end mills										
catalogue no.		d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors ref. application features

Mini | no wd. | standard series

	NW 0142 56 001	0.1	0.2	-	-	39	-	3	2	350-351 A	
	NW 0142 56 0015	0.15	0.3	-	-	39	-	3	2	350-351 A	
	NW 0142 56 002	0.2	0.5	-	-	39	-	3	2	350-351 A	
	NW 0142 56 003	0.3	1	-	-	39	-	3	2	350-351 A	
	NW 0142 56 004	0.4	1	-	-	39	-	3	2	350-351 A	
	NW 0142 56 005	0.5	1.5	-	-	39	-	3	2	350-351 A	
	NW 0142 56 006	0.6	1.5	-	-	39	-	3	2	350-351 A	
	NW 0142 56 007	0.7	2	-	-	39	-	3	2	350-351 A	
	NW 0142 56 008	0.8	2	-	-	39	-	3	2	350-351 A	
	NW 0142 56 009	0.9	2.5	-	-	39	-	3	2	350-351 A	
	NW 0142 56 010	1	3	-	-	39	-	3	2	350-351 A	
	NW 0142 56 011	1.1	3	-	-	39	-	3	2	350-351 A	
	NW 0142 56 012	1.2	3	-	-	39	-	3	2	350-351 A	
	NW 0142 56 013	1.3	3	-	-	39	-	3	2	350-351 A	
	NW 0142 56 014	1.4	4	-	-	39	-	3	2	350-351 A	
	NW 0142 56 015	1.5	4	-	-	39	-	3	2	350-351 A	
	NW 0142 56 016	1.6	4	-	-	39	-	3	2	350-351 A	
	NW 0142 56 017	1.7	4	-	-	39	-	3	2	350-351 A	
	NW 0142 56 018	1.8	5	-	-	39	-	3	2	350-351 A	

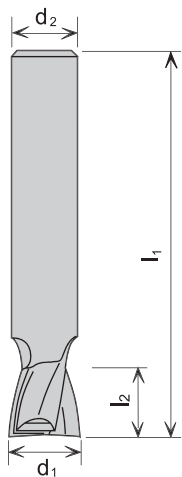
Solid carbide end mills

catalogue no.

 d_1
 l_2
 l_3
 d_3
 l_1
 r
 d_2
 z

ref. pg. arbors
ref. application
features

Mini | no wd. | standard series



NW 0142 56 019

1.9

5

-

-

39

-

3

2

350-351
A

✓

NW 0142 56 020

2

5

-

-

39

-

3

2

350-351
A

✓

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing



END MILLS

2 flutes for steel | no wd. | stand. series

0222

2 flutes, plain shank, straight face, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- without working depth
- with chamfer

1/2 ▶

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.										ref. pg. arbors	
				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z
										ref. application	
										features	

no wd. standard series											
	NW 0222 56 0041	0.4	0.6	-	-	50	-	4	2	352-355 A	
	NW 0222 56 0051	0.5	0.75	-	-	50	-	4	2	352-355 A	
	NW 0222 56 0061	0.6	0.9	-	-	50	-	4	2	352-355 A	
	NW 0222 56 0081	0.8	1.2	-	-	50	-	4	2	352-355 A	
	NW 0222 56 0101	1	1.5	-	-	50	-	4	2	352-355 A	
	NW 0222 56 0121	1.2	2	-	-	50	-	4	2	352-355 A	
	NW 0222 56 0141	1.4	2	-	-	50	-	4	2	352-355 A	
	NW 0222 56 0152	1.5	2.5	-	-	50	-	4	2	352-355 A	
	NW 0222 56 0151	1.5	2.5	-	-	57	-	6	2	356-360 A	
	NW 0222 56 020	2	3	-	-	50	-	4	2	352-355 A	
	NW 0222 56 022	2	3	-	-	57	-	6	2	356-360 A	
	NW 0222 56 0251	2.5	4	-	-	50	-	4	2	352-355 A	
	NW 0222 56 025	2.5	4	-	-	57	-	6	2	356-360 A	
	NW 0222 56 030	3	4.5	-	-	50	-	4	2	352-355 A	
	NW 0222 56 031	3	4.5	-	-	57	-	6	2	356-360 A	
	NW 0222 56 041	4	6	-	-	50	-	4	2	352-355 A	
	NW 0222 56 040	4	6	-	-	57	-	6	2	356-360 A	
	NW 0222 56 050	5	7.5	-	-	57	-	6	2	356-360 A	
	NW 0222 56 060	6	9	-	-	57	-	6	2	356-360 A	

Solid carbide end mills

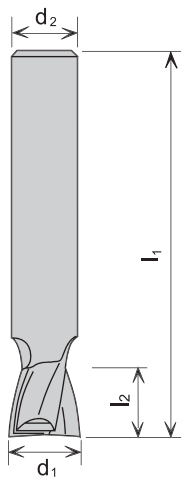
catalogue no.

 d_1
 l_2
 l_3
 d_3
 l_1
 r
 d_2
 z

ref. pg. arbors
ref. application

features

no wd. | standard series



NW 0222 56 080

8

12

-

-

63

-

8

2

361-365
A

☒ C ☒ HSM

NW 0222 56 100

10

15

-

-

72

-

10

2

366-370
A

☒ C ☒ HSM

NW 0222 56 120

12

18

-

-

83

-

12

2

371-374
A

☒ C ☒ HSM

NW 0222 56 160

16

24

-

-

92

-

16

2

375-378
A

☒ C ☒ HSM

NW 0222 56 180

18

36

-

-

92

-

18

2

A

☒ C ☒ HSM

NW 0222 56 200

20

30

-

-

104

-

20

2

379-381
A

☒ C ☒ HSM

major application
minor application


roughing



roughing



pre-finishing



pre-finishing



finishing



finishing



END MILLS

2 flutes for steel | w. wd. | long series

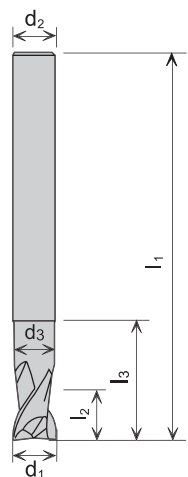
0322

2 flutes, plain shank, straight face, centre cutting, 30° right hand helix, PVTi-coated

- long series
- with working depth
- with chamfer

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

w. wd. long series															
	NW 0322 56 020	2	3	10	1.9	75	-	6	2	356-360 A		WD	C		HSM
	NW 0322 56 030	3	4.5	12	2.9	75	-	6	2	356-360 A		WD	C		HSM
	NW 0322 56 040	4	6	12	3.8	75	-	6	2	356-360 A		WD	C		HSM
	NW 0322 56 050	5	7.5	15	4.8	75	-	6	2	356-360 A		WD	C		HSM
	NW 0322 56 060	6	9	20	5.8	75	-	6	2	356-360 A		WD	C		HSM
	NW 0322 56 080	8	12	26	7.8	90	-	8	2	361-365 A		WD	C		HSM
	NW 0322 56 100	10	15	31	9.8	100	-	10	2	366-370 A		WD	C		HSM
	NW 0322 56 120	12	18	37	11.8	110	-	12	2	371-374 A		WD	C		HSM
	NW 0322 56 160	16	24	43	15.8	140	-	16	2	375-378 A		WD	C		HSM
	NW 0322 56 200	20	30	53	19.8	150	-	20	2	379-381 A		WD	C		HSM

END MILLS

2 flutes for steel | extra long series

0132

2 flutes, plain shank, straight face + sharp corner, centre cutting, 30° right hand helix, PVTi-coated

- extra long series
- also suitable for model making

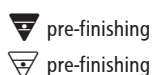


Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.						ref. pg. arbors ref. application features					
		d_1	l_2	l_3	d_3	l_1	r	d_2	z		

extra long series											
	NW 0132 56 030	3	30	-	-	60	-	3	2	350-351 A	
	NW 0132 56 031	3	30	-	-	75	-	3	2	350-351 A	
	NW 0132 56 040	4	30	-	-	60	-	4	2	352-355 A	
	NW 0132 56 041	4	30	-	-	75	-	4	2	352-355 A	
	NW 0132 56 050	5	35	-	-	70	-	5	2	385 A	
	NW 0132 56 051	5	40	-	-	100	-	5	2	385 A	
	NW 0132 56 060	6	40	-	-	100	-	6	2	356-360 A	
	NW 0132 56 061	6	50	-	-	150	-	6	2	356-360 A	
	NW 0132 56 080	8	40	-	-	100	-	8	2	361-365 A	
	NW 0132 56 081	8	50	-	-	150	-	8	2	361-365 A	
	NW 0132 56 100	10	45	-	-	100	-	10	2	366-370 A	
	NW 0132 56 101	10	60	-	-	150	-	10	2	366-370 A	
	NW 0132 56 120	12	45	-	-	100	-	12	2	371-374 A	
	NW 0132 56 121	12	75	-	-	150	-	12	2	371-374 A	
	NW 0132 56 160	16	45	-	-	100	-	16	2	375-378 A	
	NW 0132 56 161	16	75	-	-	150	-	16	2	375-378 A	
	NW 0132 46 200	20	50	-	-	100	-	20	2	379-381 A	
	NW 0132 56 200	20	40	-	-	100	-	20	2	379-381 A	
	NW 0132 56 201	20	75	-	-	150	-	20	2	379-381 A	

major application
minor application





END MILLS

4 flutes for steel | no wd. | stand. series

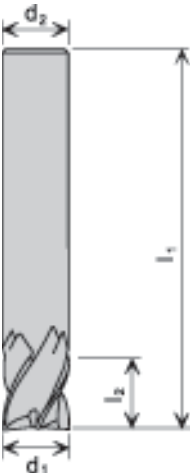
0224

4 flutes, plain shank, straight face, centre cutting, 30° right hand helix, PVTi-coated

- standard series
- without working depth
- with chamfer

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills															
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg.	arbors	ref. application	features

no wd. standard series														
	NW 0224 56 015	1.5	2.5	-	-	50	-	4	4	352-355 A	☒ C HSM			
	NW 0224 56 021	2	3	-	-	50	-	4	4	352-355 A	☒ C HSM			
	NW 0224 56 022	2	3	-	-	57	-	6	4	356-360 A	☒ C HSM			
	NW 0224 56 031	3	4.5	-	-	50	-	4	4	352-355 A	☒ C HSM			
	NW 0224 56 030	3	4.5	-	-	57	-	6	4	356-360 A	☒ C HSM			
	NW 0224 56 040	4	6	-	-	57	-	6	4	356-360 A	☒ C HSM			
	NW 0224 56 050	5	7.5	-	-	57	-	6	4	356-360 A	☒ C HSM			
	NW 0224 56 060	6	9	-	-	57	-	6	4	356-360 A	☒ C HSM			
	NW 0224 56 080	8	12	-	-	63	-	8	4	361-365 A	☒ C HSM			
	NW 0224 56 100	10	15	-	-	72	-	10	4	366-370 A	☒ C HSM			
	NW 0224 56 120	12	18	-	-	83	-	12	4	371-374 A	☒ C HSM			
	NW 0224 56 160	16	24	-	-	92	-	16	4	375-378 A	☒ C HSM			
	NW 0224 56 200	20	30	-	-	104	-	20	4	379-381 A	☒ C HSM			

END MILLS

4 flutes for steel | w. wd. | long series

0324

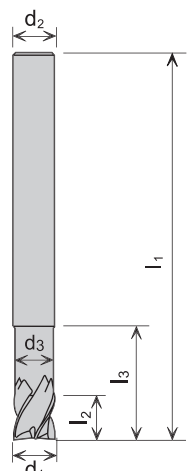
4 flutes, plain shank, straight face, centre cutting, 30° right hand helix, PVTi-coated

- long series
- with working depth
- with chamfer



Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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w. wd. long series											
	NW 0324 56 020	2	4	10	1.9	75	-	6	4	356-360 A	  
	NW 0324 56 030	3	4.5	12	2.9	75	-	6	4	356-360 A	  
	NW 0324 56 040	4	6	12	3.8	75	-	6	4	356-360 A	  
	NW 0324 56 050	5	7.5	15	4.8	75	-	6	4	356-360 A	  
	NW 0324 56 060	6	9	20	5.8	75	-	6	4	356-360 A	  
	NW 0324 56 080	8	12	26	7.8	90	-	8	4	361-365 A	  
	NW 0324 56 100	10	15	31	9.8	100	-	10	4	366-370 A	  
	NW 0324 56 120	12	18	37	11.8	110	-	12	4	371-374 A	  
	NW 0324 56 160	16	24	43	15.8	140	-	16	4	375-378 A	  
	NW 0324 56 200	20	30	53	19.8	150	-	20	4	379-381 A	  

major application
minor application

roughing
 pre-finishing

pre-finishing
 finishing

finishing
 pre-finishing



END MILLS

4 flutes for steel | extra long series

0134

4 flutes, plain shank, straight face + sharp corner, centre cutting, 30° right hand helix, PVTi-coated

- extra long series
- also suitable for model making

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors ref. application		features

extra long series														
	NW 0134 56 030	3	30	-	-	60	-	3	4	350-351 A				
	NW 0134 56 031	3	30	-	-	75	-	3	4	350-351 A				
	NW 0134 56 040	4	30	-	-	60	-	4	4	352-355 A				
	NW 0134 56 041	4	30	-	-	75	-	4	4	352-355 A				
	NW 0134 56 050	5	35	-	-	70	-	5	4	385 A				
	NW 0134 56 051	5	40	-	-	100	-	5	4	385 A				
	NW 0134 56 060	6	40	-	-	100	-	6	4	356-360 A				
	NW 0134 56 061	6	50	-	-	150	-	6	4	356-360 A				
	NW 0134 56 080	8	40	-	-	100	-	8	4	361-365 A				
	NW 0134 56 081	8	50	-	-	150	-	8	4	361-365 A				
	NW 0134 56 100	10	45	-	-	100	-	10	4	366-370 A				
	NW 0134 56 101	10	60	-	-	150	-	10	4	366-370 A				
	NW 0134 56 120	12	45	-	-	100	-	12	4	371-374 A				
	NW 0134 56 121	12	75	-	-	150	-	12	4	371-374 A				
	NW 0134 56 160	16	45	-	-	100	-	16	4	375-378 A				
	NW 0134 56 161	16	75	-	-	150	-	16	4	375-378 A				
	NW 0134 56 200	20	40	-	-	100	-	20	4	379-381 A				
	NW 0134 56 201	20	75	-	-	150	-	20	4	379-381 A				

END MILLS

6 - 8 flutes f. hardened steel | no wd. | stand. series

0280

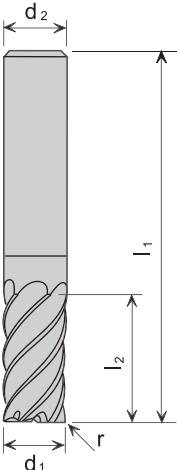
multiple flutes, plain shank, centre cutting, 50° right hand helix, PVTi-coated

- corner radius for edge stabilisation
- standard series
- on demand: available with working depth

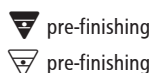


Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors ref. application		features

no wd. standard series											
	NW 0280 56 060	6	12	-	-	57	1	6	6	356-360 A	
	NW 0280 56 080	8	16	-	-	63	1	8	6	361-365 A	
	NW 0280 56 100	10	20	-	-	72	1.5	10	6	366-370 A	
	NW 0280 56 120	12	24	-	-	83	1.5	12	6	371-374 A	
	NW 0280 56 160	16	32	-	-	92	2	16	6	375-378 A	
	NW 0280 56 200	20	40	-	-	104	2	20	8	379-381 A	

major application
minor application





END MILLS

3-4 fl. for steel | extreme milling | no wd. | std. series

0370

3-4 flutes, plain shank, straight face, centre cutting, 50° right hand helix, PVTi-coated

- standard series
- also available with clamping flats, from 12 mm diam. onwards obligatory
- on demand: available with working depth

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills											
catalogue no.						ref. pg. arbors ref. application features					
	d_1	l_2	l_3	d_3	l_1	r	d_2	z			

standard series											
	NW 0370 56 020	2	4	-	-	57	-	6	3	356-360 A	
	NW 0370 56 025	2.5	5	-	-	57	-	6	3	356-360 A	
	NW 0370 56 030	3	6	-	-	57	-	6	4	356-360 A	
	NW 0370 56 035	3.5	7	-	-	57	-	6	4	356-360 A	
	NW 0370 56 040	4	8	-	-	57	-	6	4	356-360 A	
	NW 0370 56 045	4.5	9	-	-	57	-	6	4	356-360 A	
	NW 0370 56 050	5	10	-	-	57	-	6	4	356-360 A	
	NW 0370 56 060	6	12	-	-	57	-	6	4	356-360 A	
	NW 0370 56 070	7	14	-	-	63	-	8	4	361-365 A	
	NW 0370 56 080	8	16	-	-	63	-	8	4	361-365 A	
	NW 0370 56 090	9	18	-	-	72	-	10	4	366-370 A	
	NW 0370 56 100	10	20	-	-	72	-	10	4	366-370 A	
	NW 0370 56 120	12	24	-	-	83	-	12	4	371-374 A	
	NW 0370 56 160	16	32	-	-	92	-	16	4	375-378 A	
	NW 0370 56 200	20	40	-	-	104	-	20	4	379-381 A	

END MILLS

3-4 fl. for steel | extreme milling | no wd. | long series

0290

3-4 flutes, plain shank, straight face, centre cutting, 50° right hand helix, PVTi-coated

- long series
- also available with clamping flats, from 12 mm diam. onwards obligatory
- on demand: available with working depth

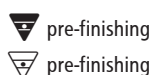


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

long series													
	NW 0290 56 061	6	18	-	-	75	-	6	4	356-360 A			
	NW 0290 56 081	8	24	-	-	90	-	8	4	361-365 A			
	NW 0290 56 101	10	30	-	-	100	-	10	4	366-370 A			
	NW 0290 56 121	12	36	-	-	110	-	12	4	371-374 A			
	NW 0290 56 161	16	48	-	-	140	-	16	4	375-378 A			
	NW 0290 56 201	20	60	-	-	150	-	20	4	379-381 A			

major application
minor application





END MILLS

4 fl. f. steel | extreme milling | no wd. | std. | corner rad.

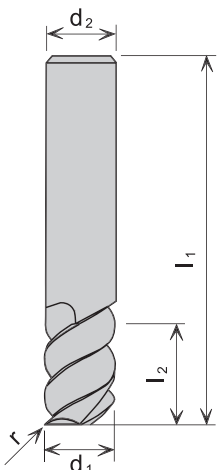
0380

4 flutes, plain shank, straight face, centre cutting, 50° right hand helix, PVTi-coated

- standard series
- also available with clamping flats, from 12 mm diam. onwards obligatory
- with corner radius for edge stabilization
- on demand: available with working depth

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills															
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg.	arbors	ref. application	features

standard series											
	NW 0380 56 030	3	6	-	-	57	0.3	6	4	356-360 A	
	NW 0380 56 040	4	8	-	-	57	0.3	6	4	356-360 A	
	NW 0380 56 050	5	10	-	-	57	0.3	6	4	356-360 A	
	NW 0380 56 060	6	12	-	-	57	0.3	6	4	356-360 A	
	NW 0380 56 080	8	16	-	-	63	0.5	8	4	361-365 A	
	NW 0380 56 090	9	18	-	-	72	0.5	10	4	366-370 A	
	NW 0380 56 100	10	20	-	-	72	0.5	10	4	366-370 A	
	NW 0380 56 120	12	24	-	-	83	1	12	4	371-374 A	
	NW 0380 56 160	16	32	-	-	92	1	16	4	375-378 A	
	NW 0380 56 200	20	40	-	-	104	1	20	4	379-381 A	

END MILLS

4 fl. f. steel | extreme milling | no wd. | long | corner rad.

0390

4 flutes, plain shank, straight face, centre cutting, 50° right hand helix, PVTi-coated

- long series
- also available with clamping flats, form 12 mm diam. onwards obligatory
- with corner radius for edge stabilization
- on demand: available with working depth

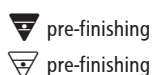


Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors ref. application		features

long series														
	NW 0390 56 061	6	18	-	-	75	0.3	6	4	356-360 A				
	NW 0390 56 081	8	24	-	-	90	0.5	8	4	361-365 A				
	NW 0390 56 101	10	30	-	-	100	0.5	10	4	366-370 A				
	NW 0390 56 121	12	36	-	-	110	1	12	4	371-374 A				
	NW 0390 56 161	16	48	-	-	140	1	16	4	375-378 A				
	NW 0390 56 201	20	60	-	-	150	1	20	4	379-381 A				

major application
minor application





END MILLS

UGT 4 flutes, f. stainl. steel + heat-resist. alloys

0504

4 flutes end mills, plain shank, sharp corner, centre cutting, PVST-coated

- with or without clamping flats
- unequal division
- unequal helix angle

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVST

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features

no wd. standard series												NEW		
	NW 0504 56 030	3	8	-	-	57	-	6	4	356-360 A		NEW	HSM	
	NW 0504 56 040	4	10	-	-	57	-	6	4	356-360 A		NEW	HSM	
	NW 0504 56 050	5	12	-	-	57	-	6	4	356-360 A		NEW	HSM	
	NW 0504 56 060	6	16	-	-	57	-	6	4	356-360 A		NEW	HSM	
	NW 0504 56 080	8	20	-	-	63	-	8	4	361-365 A		NEW	HSM	
	NW 0504 56 100	10	26	-	-	72	-	10	4	366-370 A		NEW	HSM	
	NW 0504 56 120	12	30	-	-	83	-	12	4	371-374 A		NEW	HSM	
	NW 0504 56 160	16	37	-	-	92	-	16	4	375-378 A		NEW	HSM	
	NW 0504 56 200	20	44	-	-	104	-	20	4	379-381 A		NEW	HSM	
	NW 0504 56 250	25	50	-	-	104	-	25	4	382-383 A		NEW	HSM	

END MILLS

UGT 4 fl. f. stainl. steel + heat-resist. alloys | corn. rad.

0514

4 flutes end mills, plain shank, centre cutting, PVST-coated

- corner radius
- with or without clamping flats
- unequal division
- unequal helix angle

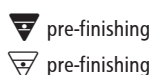


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							UMGC	PVST

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

no wd. standard series											NEW		
	NW 0514 56 030	3	8	-	-	57	0.2	6	4	356-360 A		NEW	HSM
	NW 0514 56 040	4	10	-	-	57	0.3	6	4	356-360 A		NEW	HSM
	NW 0514 56 050	5	12	-	-	57	0.4	6	4	356-360 A		NEW	HSM
	NW 0514 56 060	6	16	-	-	57	0.5	6	4	356-360 A		NEW	HSM
	NW 0514 56 080	8	20	-	-	63	0.5	8	4	361-365 A		NEW	HSM
	NW 0514 56 100	10	26	-	-	72	1	10	4	366-370 A		NEW	HSM
	NW 0514 56 120	12	30	-	-	83	1	12	4	371-374 A		NEW	HSM
	NW 0514 56 160	16	37	-	-	92	2	16	4	375-378 A		NEW	HSM
	NW 0514 56 200	20	44	-	-	104	2	20	4	379-381 A		NEW	HSM
	NW 0514 56 250	25	50	-	-	104	3	25	4	382-383 A		NEW	HSM

major application
minor application





END MILLS

4 - 8 flutes for steel | no wd. | stand. series

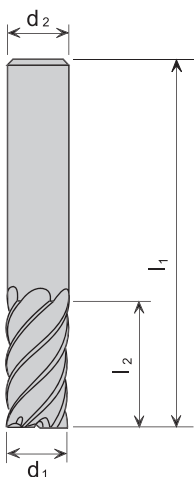
0259

multiple flutes, plain shank, straight face, centre cutting, 50° right hand helix, PVTi-coated

- standard series
- on demand: available with working depth

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills														
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors ref. application		features

no wd. standard series											
	NW 0259 56 040	4	8	-	-	57	-	6	4	356-360 A	
	NW 0259 56 050	5	10	-	-	57	-	6	5	356-360 A	
	NW 0259 56 060	6	12	-	-	57	-	6	6	356-360 A	
	NW 0259 56 080	8	16	-	-	63	-	8	6	361-365 A	
	NW 0259 56 100	10	20	-	-	72	-	10	6	366-370 A	
	NW 0259 56 120	12	24	-	-	83	-	12	6	371-374 A	
	NW 0259 56 160	16	32	-	-	92	-	16	6	375-378 A	
	NW 0259 56 200	20	40	-	-	104	-	20	8	379-381 A	

END MILLS

4 - 8 flutes for steel | no wd. | long series

0359

multiple flutes, plain shank, straight face, centre cutting, 50° right hand helix, PVTi-coated

- long series
- on demand: available with working depth

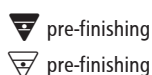


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVTi

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z					

no wd. long series													
	NW 0359 56 040	4	12	-	-	57	-	6	4	356-360 A			HSM
	NW 0359 56 050	5	15	-	-	57	-	6	5	356-360 A			HSM
	NW 0359 56 060	6	18	-	-	57	-	6	6	356-360 A			HSM
	NW 0359 56 080	8	24	-	-	63	-	8	6	361-365 A			HSM
	NW 0359 56 100	10	30	-	-	72	-	10	6	366-370 A			HSM
	NW 0359 56 120	12	36	-	-	83	-	12	6	371-374 A			HSM
	NW 0359 56 140	14	42	-	-	100	-	14	6	A			HSM
	NW 0359 56 160	16	48	-	-	92	-	16	6	375-378 A			HSM
	NW 0359 56 200	20	60	-	-	125	-	20	8	379-381 A			HSM

major application
minor application



4 - 6 fl. f. hardened steel | no wd. | stand.+ long

multiple flutes, plain shank, straight face, centre cutting, 60° right hand helix, PVTi-coated

- standard and long series
- without working depth

	Material Classification							
		steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade
A							MGC	PVTi

Solid carbide end mills											
catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features

[illegible]

END MILLS

2 flutes f. non-ferr. mat. | w. + no wd. | std. + long

0412

2 flutes, plain shank, straight face, centre cutting, 45° right hand helix, PVAS-coated

- standard and long series
- on demand: available with working depth



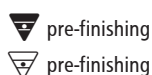
1/3

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVAS

Solid carbide end mills	catalogue no.	d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z	ref. pg. arbors	ref. application	features
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w. + no wd. std. + long series															
	NV 0412 47 010	1	2	-	-	50	-	4	2	352-355 A					
	NV 0412 47 0102	1	2	10	0.95	50	-	4	2	352-355 A					
	NV 0412 47 0103	1	2	15	0.95	50	-	4	2	352-355 A					
	NV 0412 47 015	1.5	3	-	-	50	-	4	2	352-355 A					
	NV 0412 47 0152	1.5	3	10	1.4	50	-	4	2	352-355 A					
	NV 0412 47 0153	1.5	3	15	1.4	50	-	4	2	352-355 A					
	NV 0412 47 021	2	4	-	-	50	-	4	2	352-355 A					
	NV 0412 47 0212	2	4	10	1.9	50	-	4	2	352-355 A					
	NV 0412 47 0214	2	4	20	1.9	50	-	4	2	352-355 A					
	NV 0412 47 0215	2	4	30	1.9	50	-	4	2	352-355 A					
	NV 0412 47 020	2	4	-	-	57	-	6	2	356-360 A					
	NV 0412 47 025	2.5	5	-	-	50	-	4	2	352-355 A					
	NV 0412 47 0252	2.5	5	10	2.4	50	-	4	2	352-355 A					
	NV 0412 47 0254	2.5	5	20	2.4	50	-	4	2	352-355 A					
	NV 0412 47 031	3	6	-	-	50	-	4	2	352-355 A					
	NV 0412 47 030	3	6	-	-	57	-	6	2	356-360 A					
	NV 0412 47 0302	3	6	10	2.9	57	-	6	2	356-360 A					
	NV 0412 47 0304	3	6	20	2.9	57	-	6	2	356-360 A					
	NV 0412 47 0305	3	6	30	2.9	75	-	6	2	356-360 A					

major application
minor application





END MILLS

2 flutes f. non-ferr. mat. | w. + no wd. | std. + long

0412

2 flutes, plain shank, straight face, centre cutting, 45° right hand helix, PVAS-coated

- standard and long series
- on demand: available with working depth

2/3

Material Classification	Material							
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVAS

Solid carbide end mills									
catalogue no.									
	d_1	l_2	l_3	d_3	l_1	r	d_2	z	
									ref. pg. arbors ref. application features

w. + no wd. std. + long series											
	NW 0412 47 041	4	8	-	-	50	-	4	2	352-355 A	
	NW 0412 47 040	4	8	-	-	57	-	6	2	356-360 A	
	NW 0412 47 0402	4	8	10	3.8	57	-	6	2	356-360 A	
	NW 0412 47 0404	4	8	20	3.8	57	-	6	2	356-360 A	
	NW 0412 47 0405	4	8	30	3.8	75	-	6	2	356-360 A	
	NW 0412 47 0406	4	8	40	3.8	75	-	6	2	356-360 A	
	NW 0412 47 050	5	10	-	-	57	-	6	2	356-360 A	
	NW 0412 47 0504	5	10	20	4.8	57	-	6	2	356-360 A	
	NW 0412 47 0505	5	10	30	4.8	75	-	6	2	356-360 A	
	NW 0412 47 060	6	12	-	-	57	-	6	2	356-360 A	
	NW 0412 47 0602	6	12	15	5.8	57	-	6	2	356-360 A	
	NW 0412 47 0604	6	12	20	5.8	57	-	6	2	356-360 A	
	NW 0412 47 0605	6	12	30	5.8	75	-	6	2	356-360 A	
	NW 0412 47 0606	6	12	40	5.8	75	-	6	2	356-360 A	
	NW 0412 47 080	8	16	-	-	63	-	8	2	361-365 A	
	NW 0412 47 0804	8	16	20	7.8	63	-	8	2	361-365 A	
	NW 0412 47 0805	8	16	40	7.8	90	-	8	2	361-365 A	
	NW 0412 47 0807	8	16	60	7.8	100	-	8	2	361-365 A	
	NW 0412 47 100	10	20	-	-	72	-	10	2	366-370 A	



END MILLS

2 flutes f. non-ferr. mat. | w. + no wd. | std. + long

0422

2 flutes, plain shank, straight face, centre cutting, 45° right hand helix, PVAS-coated

- long series
- on demand: available with working depth

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	

Solid carbide end mills											
catalogue no.				d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z
								ref. pg. arbors			
								ref. application			
								features			

no wd. long series											
	NW 0422 47 030	3	15	-	-	60	-	3	2	350-351 A	
	NW 0422 47 031	3	15	-	-	75	-	3	2	350-351 A	
	NW 0422 47 040	4	20	-	-	60	-	4	2	352-355 A	
	NW 0422 47 041	4	20	-	-	75	-	4	2	352-355 A	
	NW 0422 47 042	4	20	-	-	100	-	4	2	352-355 A	
	NW 0422 47 050	5	20	-	-	70	-	5	2	385 A	
	NW 0422 47 0506	5	20	-	-	75	-	6	2	356-360 A	
	NW 0422 47 0516	5	20	-	-	100	-	6	2	356-360 A	
	NW 0422 47 060	6	20	-	-	100	-	6	2	356-360 A	
	NW 0422 47 061	6	20	-	-	150	-	6	2	356-360 A	
	NW 0422 47 080	8	25	-	-	100	-	8	2	361-365 A	
	NW 0422 47 081	8	25	-	-	150	-	8	2	361-365 A	
	NW 0422 47 100	10	25	-	-	100	-	10	2	366-370 A	
	NW 0422 47 101	10	25	-	-	150	-	10	2	366-370 A	
	NW 0422 47 120	12	30	-	-	100	-	12	2	371-374 A	
	NW 0422 47 121	12	30	-	-	150	-	12	2	371-374 A	
	NW 0422 47 161	16	30	-	-	150	-	16	2	375-378 A	
	NW 0422 47 201	20	35	-	-	150	-	20	2	379-381 A	

END MILLS

3 flutes f. graphite | pre-finishing and roughing

0493

3 flutes, plain shank, straight face, centre cutting, 45° right hand helix

- up to 3 mm diam.: PVDiaG - diamond coating
- over 3 mm diam.: PVDiaN - diamond coating
- standard and long series
- with and without working depth
- **Attention: for graphite machining only**

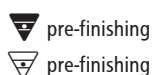


Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills									
catalogue no.		d ₁	l ₂	l ₃	d ₃	l ₁	r	d ₂	z
		ref. pg. arbors ref. application features							

w. + no wd. std. + long series											
	NW 0493 48 034	3	10	-	-	50	-	4	3	352-355 A	
	SVW 0493 48 031	3	20	-	-	100	-	4	3	352-355 A	
	SVW 0493 48 0341	3	4.5	10	2.9	50	-	4	3	352-355 A	
	SVW 0493 48 03030	3	4.5	15	2.9	50	-	4	3	352-355 A	
	SVW 0493 48 03051	3	4.5	25	2.9	75	-	4	3	352-355 A	
	SVW 0493 48 04170	4	6	15	3.8	75	-	4	3	352-355 A	
	SVW 0493 48 04052	4	6	25	3.8	75	-	4	3	352-355 A	
	SVW 0493 48 04060	4	6	45	3.8	100	-	4	3	352-355 A	
	SVW 0493 48 0608	6	25	-	-	150	-	6	3	356-360 A	
	NW 0493 48 0631	6	40	-	-	100	-	6	3	356-360 A	
	SVW 0493 48 064	6	9	20	5.8	75	-	6	3	356-360 A	
	SVW 0493 48 06050	6	9	25	5.8	75	-	6	3	356-360 A	
	SVW 0493 48 06071	6	9	45	5.8	100	-	6	3	356-360 A	
	SVW 0493 48 08080	8	12	32	7.8	100	-	8	3	361-365 A	
	SVW 0493 48 0808101	8	12	45	7.8	100	-	8	3	361-365 A	
	NW 0493 48 105	10	25	-	-	80	-	10	3	366-370 A	
	SVW 0493 48 10090	10	15	25	9.8	100	-	10	3	366-370 A	
	SVW 0493 48 10101	10	15	45	9.8	100	-	10	3	366-370 A	
	NW 0493 48 12090	12	18	25	11.8	83	-	12	3	371-374 A	

major application
minor application





END MILLS

GGT roughing end mills f. graphite | no wd. | stand. series

0108

alternated pyramidal teeth, for machining graphite, PVDiaN-diamond coating

- 2 end teeth cutting
- plain shank, straight face
- centre cutting

Material Classification								
	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							KAC	PVDiaN

Solid carbide end mills															
catalogue no.				d_1	l_2	l_3	d_3	l_1	r	d_2	z	ref. pg. arbors		ref. application	features

no wd. standard series											NEW			
	NW 0108 48 030	3	10	-	-	50	-	3	2	350-351 A		NEW	NF	HSM
	NW 0108 48 040	4	10	-	-	50	-	4	2	352-355 A		NEW	NF	HSM
	NW 0108 48 060	6	20	-	-	57	-	6	2	356-360 A		NEW	NF	HSM
	NW 0108 48 080	8	20	-	-	60	-	8	2	361-365 A		NEW	NF	HSM
	NW 0108 48 100	10	25	-	-	70	-	10	2	366-370 A		NEW	NF	HSM
	NW 0108 48 120	12	30	-	-	85	-	12	2	371-374 A		NEW	NF	HSM
	NW 0108 48 160	16	45	-	-	85	-	16	2	375-378 A		NEW	NF	HSM

TRIGAWORX®

4 fl. f. steel | extreme milling | w. wd | stand. + long

0374

4 flutes, plain shank, special style of end teeth, PVALsa-coated

- standard and long series
- with working depth
- excellent smoothness of operation
- extremely high feed rates possible
- **Attention: r^* = corner radius to be programmed**

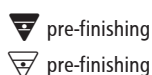


Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVALSA

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r^*	d_2	z					

w. wd. std. + long series													
	NW 0374 55 032	3	3	16	2.9	57	0,2*	6	4	356-360 A		WD	HSM
	NW 0374 55 042	4	4	18	3.8	57	0,3*	6	4	356-360 A		WD	HSM
	NW 0374 55 052	5	5	21	4.8	57	0,4*	6	4	356-360 A		WD	HSM
	NW 0374 55 062	6	6	21	5.8	57	0,5*	6	4	356-360 A		WD	HSM
	NW 0374 55 0622	6	6	64	5.8	100	0,5*	6	4	356-360 A		WD	HSM
	NW 0374 55 082	8	8	27	7.8	63	0,7*	8	4	361-365 A		WD	HSM
	NW 0374 55 0822	8	8	64	7.8	100	0,7*	8	4	361-365 A		WD	HSM
	NW 0374 55 102	10	10	32	9.8	72	0,85*	10	4	366-370 A		WD	HSM
	NW 0374 55 1022	10	10	60	9.8	100	0,85*	10	4	366-370 A		WD	HSM
	NW 0374 55 122	12	12	38	11.8	83	1*	12	4	371-374 A		WD	HSM
	NW 0374 55 1222	12	12	65	11.8	110	1*	12	4	371-374 A		WD	HSM
	NW 0374 55 162	16	16	50	15.8	92	1,4*	16	4	375-378 A		WD	HSM
	NW 0374 55 1622	16	16	65	15.8	150	1,4*	16	4	375-378 A		WD	HSM

major application
minor application



* corner radius to be programmed



TRIGAWORX®

4 fl. f. steel | extreme milling | w. wd | stand.+ long | ICS

0474

4 flutes, plain shank, special style of end teeth, PVALSA-coated

- standard and long series
- with working depth
- excellent smoothness of operation
- extremely high feed rates possible
- internal coolant or compressed-air supply
- **Attention: r^* = corner radius to be programmed**

Material Classification	steel	high-temperature alloys	stainless steel	cast iron	non-ferrous materials	hardened steel	Carbide Grade	Coating
A							MGC	PVALSA

Solid carbide end mills	catalogue no.										ref. pg. arbors	ref. application	features
	d_1	l_2	l_3	d_3	l_1	r^*	d_2	z					

w. wd. std. + long series IC													
	NW 0474 55 041	4	4	12	3.8	57	0,3*	6	4	356-360 A			
	NW 0474 55 061	6	6	21	5.8	57	0,5*	6	4	356-360 A			
	NW 0474 55 0611	6	6	64	5.8	100	0,5*	6	4	356-360 A			
	NW 0474 55 081	8	8	27	7.8	63	0,7*	8	4	361-365 A			
	NW 0474 55 0811	8	8	64	7.8	100	0,7*	8	4	361-365 A			
	NW 0474 55 101	10	10	32	9.8	72	0,85*	10	4	366-370 A			
	NW 0474 55 1011	10	10	60	9.8	100	0,85*	10	4	366-370 A			
	NW 0474 55 121	12	12	38	11.8	83	1*	12	4	371-374 A			
	NW 0474 55 1211	12	12	65	11.8	110	1*	12	4	371-374 A			
	NW 0474 55 162	16	16	50	15.8	92	1,4*	16	4	375-378 A			
	NW 0474 55 1621	16	16	65	15.8	150	1,4*	16	4	375-378 A			

* corner radius to be programmed

latest items!

available as long as stock lasts

on request

stock item, subject to confirmation

pokoIm C voha

PREMIUMTOOLS. WE KNOW HOW.

major application
minor application

roughing
roughing

pre-finishing
pre-finishing

finishing
finishing

Service

Know-How

Milling Cutter
Bodies

Indexable Inserts

Solid Carbide
End Mills

Arbor and Adapter
Systems

High-Speed Spindle
Systems/Shrinking
Technology

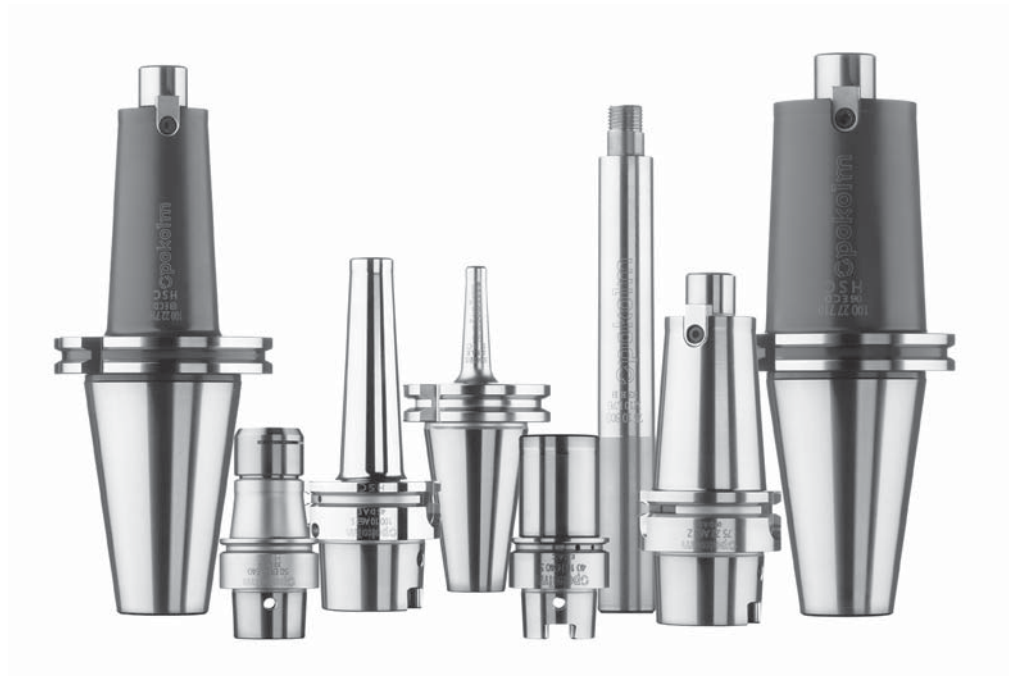
Accessories

Customized
Products

Operation Data

Index

ARBOR AND ADAPTER SYSTEMS



Pokolm-Voha Arbor systems are suitable for just about every milling machine centre in the market. Pokolm-Voha-Arbor- and adapter- systems

Pokolm-Voha-Arbor-systems are compatible with all existing machine spindle connections. Our large selection of different designs ranging from extremely slim shrinking arbors to very rigid arbors for shell-type milling cutter bodies – together with the finely graduated lengths and numerous connecting adapters, reductions, and extensions – guarantee optimum stability with maximum flexibility and liberty of action in almost every application.



DuoPlug®, with its absolutely backlash-free connections, offers maximum concentricity and rigidity – an important requirement for economic high-speed milling. Especially in deep cavities!



Adapters, made of dense anti-vibration material and solid carbide, allow especially long and slim tool/arbor combinations. Greatly improved surfaces through optimum absorption of vibrations. Pokolm-Voha solid carbide adapter- systems are impressive because of its convincing advantages: They guarantee the required process reliability even when operations are unattended.



State-of-the-art technology at all times: Nearly all tools from the Pokolm-Voha range are equipped with an internal coolant supply system (ICS).



Arbors with zero-reach are always supplied in a shrink-grip connection with a DuoPlug®-solid carbide adapter or a dense anti-vibration adapter in any available length. This combination reduces torsion and vibrations to an absolute minimum.



Arbors for direct spindle mounting offer greatly increased stability because of their large contact surfaces. These arbors are screwed direct on to the spindle, leaving no gap, thus allowing excellent working conditions even in very deep milling applications.



Of course all arbors are already pre-balanced to a high balancing grade and thus fit for HSM. But milling results are also improved in conventional milling. The relevant balancing grades are given with every arbor.

A detailed overview of recommended applications is mentioned on the next pages.

ARBOR AND ADAPTER SYSTEMS

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	M 10	319
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Direct spindle mounting adapters	Flange contact surface d1 = 50	395

THE POKOLM-VOHA ARBOR SYSTEM

The optimum solution for your application

Arbor System	Advantages	Recommended applications
ARBORS (TAPERED) for THREADED SHANK END MILLS	 1 ⊕ rigid, low-cost standard design ⊕ large variety of types and lengths provides additional flexibility by using extensions and reductions ⊕ gaining rigidity by avoiding unnecessary interfaces	⊕ milling in shallow to deep profiles, for small milling cutter bodies up to 42 mm diam.
ARBORS for THREAD-CONNECTIONS CYLINDRICAL	 2 ⊕ slim shape ⊕ additional rigidity by avoiding unnecessary interfaces ⊕ where needed: additional flexibility with extensions and reductions	⊕ medium machining depths, especially on deep vertical walls for small milling cutter bodies up to 42 mm diam.
REDUCTION SLEEVES with MORSE TAPER ADAPTERS	 3 ⊕ Morse taper adapters for threaded shank end mill bodies and for shrinking processes available for solid carbide tools ⊕ fast and flexible tool change ⊕ modular design allows machining of deep slots and cavities	⊕ for standard milling operations with normal rigidity and accuracy requirements, for milling cutter bodies up to 42 mm diam.
ARBORS for SHELL TYPE MILLING CUTTER BODIES	 4 ⊕ rigid variant, in particular for roughing or pre-finishing operations with large cutter diameters and a large variety of designs ⊕ additional rigidity by avoiding unnecessary interfaces	⊕ shallow to deep machining situations for pre-finishing and rough machining, for milling cutter diameters from 42 mm to 125 mm and larger
ARBORS with DIRECT SPINDLE MOUNTING	 5 ⊕ extremely rigid style through direct spindle mounting ⊕ excellent machining conditions in deep slots or cavities ⊕ additional rigidity by avoiding interfaces	⊕ deep and extremely deep machining situations on SK 50 machines which require extreme rigidity, for milling cutter diameters from 52 to 125 mm
SHRINKING ARBORS STANDARD STYLE	 6 ⊕ slim style with 3° draft angle in direction of collar ⊕ direct shrink-grip of solid carbide tooling ⊕ additional rigidity by avoiding unnecessary interfaces ⊕ improved concentricity ⊕ combinable with solid carbide and dense antivibration adapters (see page 36-37)	⊕ machining situations in narrow space conditions for solid carbide end mills up to 25 mm diam., and when combined with solid carbide or dense antivibration adapters even for milling cutter bodies with up to 42 mm diam.

Arbor System		Advantages	Recommended Applications
SHRINKING ARBORS, REINFORCED DESIGN		4.5° draft angle, reinforced shank - direct shrink grip of solid carbide end mills - additional rigidity by avoiding unnecessary interfaces - improved concentricity	milling with increased requirements for arbor rigidity for solid carbide end mills up to 20 mm diam.
ARBOR COMBINATIONS with DUOPLUG® ADAPTERS		- extremely long and slim arbor combinations - greatest possible avoidance of vibrations by using solid carbide adapters - DuoPlug® connection for maximum precision and concentricity - stronger retention forces	- machining in deep cavities also with vertical walls - roughing operations with maximum retention forces - finishing operations with very high requirements for surface finish - up to cutter diam. of 25 mm
ARBOR COMBINATIONS with DENSE ANTI- VIBRATION ADAPTERS		- long and slim arbor combinations - minimal vibrations because of special dense antivibration material - thread connection, no shrinking process necessary	- machining in deep cavities also with vertical walls - for narrow and deep moulds and dies - machining applications with normal vibration tendency - for cutter diam. of up to 42 mm
ZERO-REACH ARBORS		by directly shrinking the solid carbide end mill or dense antivibration adaptor in the arbor taper, you can machine vertical walls right up to the arbor collar. This means great increase in rigidity because of the reduced distance between the spindle and tool.	machining of extremely deep cavities with vertical walls in very limited space and with limited movement of Z-axis, and high requirements for rigidity and vibration-free milling
ER20 PRECISION COLLET CHUCKS		- universal and good value solution, direct grip of solid carbide end mills via collet without a shrinking device - also grips unusual shank diameters and shank diameters smaller than 3 mm	- for fast changing applications - for finishing, pre-finishing, and moderate roughing operations
SHORT TAPER SYSTEM		- extra slim arbor combination - extremely small dimensions	- especially for machining components in reduced space situations, narrow and deep slots, etc. - for solid carbide end mills with 4 and 6 mm shank diam.

Please note: Zero-reach arbors cannot be ordered separately. We only supply them in a shrink-grip connection with a solid carbide or dense antivibration adapter. (Please indicate desired adapter on purchase order form.)

OUR POKOLM-VOHA BAG OF TRICKS

Shell-type Extensions

Reduction adapters - shell type to thread connections

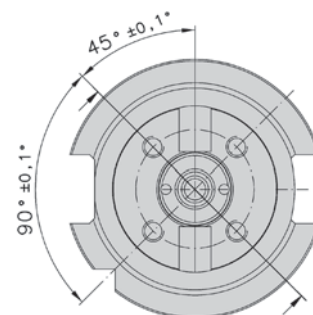
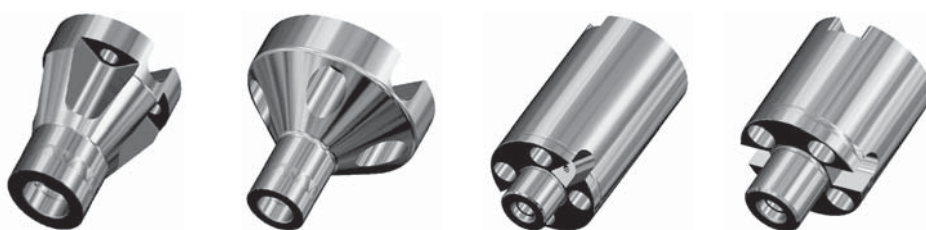
You have to machine an extensive deep component? The requested arbor-extension is not available as a standard item? The production of customized arbors is too expensive? There is no time left for any special action?

SPECIAL SITUATIONS REQUIRE SPECIAL SOLUTIONS.

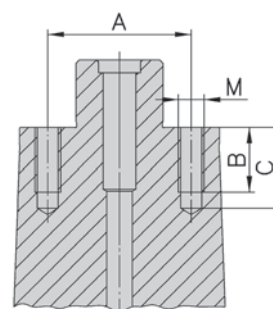
Our latest shell-type extensions and the thread-connections/shell-type combi adapters allow to achieve a possibility of assembling tool beyond our standard range.

1. an existing standard arbor has to be equipped with supplement bore holes according to our adjoining sketch.
2. screw on your selected adapter.
3. start your job.

THIS RESULTS IN EXTENSIONS BETWEEN 50 AND 100 MM



Extension - top view



Extension - side view

Catalogue-No.	Tool	Diameter of Spigot	Extensions length	A	B	C	Screws*
60 22 Mxx 783	Thread connection – Shell-type Combi Adapters	Ø 22	60	Ø 35	20	25	M 6 x 25
100 22 Mxx 783	Thread connection – Shell-type Combi Adapters	Ø 22	100	Ø 35	20	25	M 6 x 25
60 27 Mxx 783	Thread connection – Shell-type Combi Adapters	Ø 27	60	Ø 44,5	20	25	M 8 x 25
100 27 Mxx 783	Thread connection – Shell-type Combi Adapters	Ø 27	100	Ø 44,5	20	25	M 8 x 25
50 22 782	Shell-type Extensions	Ø 22	50	Ø 35	20	25	M 6 x 55
100 22 782	Shell-type Extensions	Ø 22	100	Ø 35	20	25	M 6 x 55
50 27 782	Shell-type Extensions	Ø 27	50	Ø 44,5	20	25	M 8 x 55
100 27 782	Shell-type Extensions	Ø 27	100	Ø 44,5	20	25	M 8 x 55

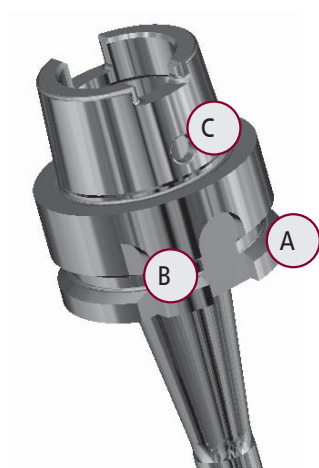
*for fixing an adapter, you need 4 screws each, included in extent of supply.

You are going to find all available sizes and designs in the following "Chapter for arbors and adapters."

HSK FORMS AND DESIGNS

Form A

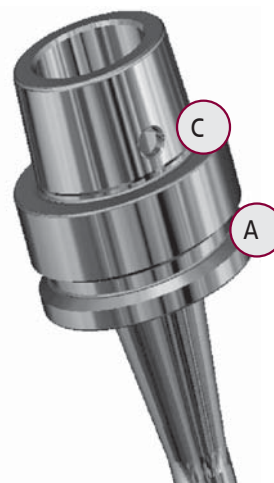
Form A is automatically changeable via gripper groove (A) and index slots (B). The index slots provide a defined position for stopping the spindle. Drill hole (C) is for manual operation of gripping mechanism and central coolant supply.



DIN 69 893-1

Form E

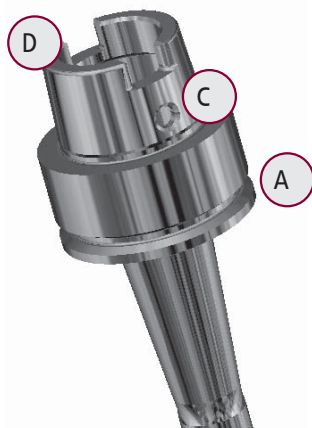
Automatically changeable via gripper groove (A). Drill hole (C) for manual operation of gripping mechanism.



DIN 69 893-5

Form EC

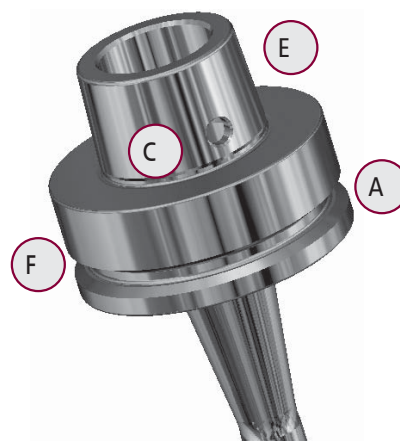
EC in its basic design conforms to form E. Additional driving slots (D) allow use in machining centres with a machine connection of forms C as well as E. Drill hole (C) for manual operation of gripping mechanism.



Based on
DIN 69 893-5

Form F

Automatically changeable via gripper groove (A). Drill hole (C) for manual operation of gripping mechanism. In order to secure a larger contact surface, the diameter of the tapered machine connection (E) is reduced in relation to the collar diameter (F).



DIN 69 893-6



FOR POKOLM DUOPLUG®

M 7 - M 16

These solid carbide adapters of the POKOLM DuoPlug® system are suitable for high-speed milling and ensure extreme precision because of their backlash-free connections, as well as absolute concentricity, rigidity, and a safe load transmission. They also have the retention forces required for extreme roughing applications.

1/2 ▶

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

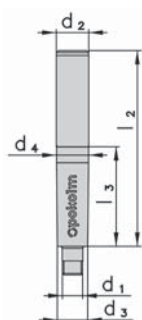
Form/DIN

l₂

l₁

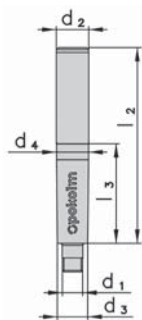
ref. pg. arbors
ref. accessories
features

M 7



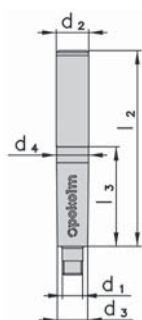
20 07 603	M 7	20	10.8	11.9	diam. 12	-	68	-	371-374	✓
40 07 603	M 7	40	10.8	11.9	diam. 12	-	88	-	371-374	✓
60 07 603	M 7	60	10.8	15.9	diam. 16	-	108	-	375-378	⚠
80 07 603	M 7	80	10.8	15.9	diam. 16	-	128	-	375-378	⚠

M 10



25 10 603	M 10	25	15	15.9	diam. 16	-	73	-	375-378	✓
50 10 603	M 10	50	15	15.9	diam. 16	-	98	-	375-378	✓
75 10 603	M 10	75	15	15.9	diam. 16	-	123	-	375-378	✓
100 10 603	M 10	100	15	15.9	diam. 16	-	148	-	375-378	✓
125 10 603	M 10	125	15	15.9	diam. 16	-	173	-	375-378	✓
150 10 603	M 10	150	15	15.9	diam. 16	-	200	-	375-378	✓

M 12



25 12 603	M 12	25	18.5	19.9	diam. 20	-	75	-	379-381	✓
50 12 603	M 12	50	18.5	19.9	diam. 20	-	100	-	379-381	✓
75 12 603	M 12	75	18.5	19.9	diam. 20	-	125	-	379-381	✓
100 12 603	M 12	100	18.5	19.9	diam. 20	-	150	-	379-381	✓
125 12 603	M 12	125	18.5	19.9	diam. 20	-	175	-	379-381	✓
150 12 603	M 12	150	18.5	19.9	diam. 20	-	200	-	379-381	✓
175 12 603	M 12	175	18.5	19.9	diam. 20	-	225	-	379-381	✓

Arbor and Adapter
Systems

catalogue no.

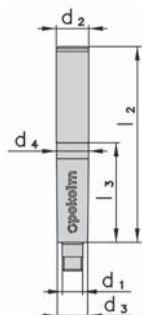
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

M 16



25 16 603	M 16	25	23.4	24.9	diam. 25	-	81	-	382-383	✓ HSM
50 16 603	M 16	50	23.4	24.9	diam. 25	-	106	-	382-383	✓ HSM
75 16 603	M 16	75	23.4	24.9	diam. 25	-	131	-	382-383	✓ HSM
100 16 603	M 16	100	23.4	24.9	diam. 25	-	156	-	382-383	✓ HSM
125 16 603	M 16	125	23.4	24.9	diam. 25	-	181	-	382-383	✓ HSM
150 16 603	M 16	150	23.4	24.9	diam. 25	-	206	-	382-383	✓ HSM
175 16 603	M 16	175	23.4	24.9	diam. 25	-	231	-	382-383	✓ HSM
200 16 603	M 16	200	23.4	24.9	diam. 25	-	256	-	382-383	✓ HSM



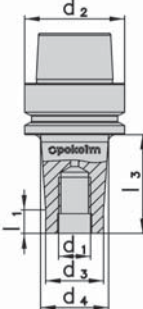
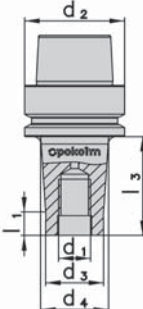
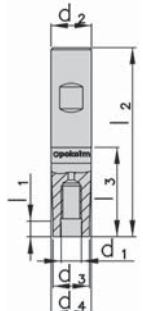
FOR THREADED SHANK END MILL BODIES

M 5

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

1/2

Arbor and Adapter Systems

Arbor and Adapter Systems		catalogue no.					Form/DIN					ref. pg. arbors ref. accessories features	
		d ₁	l ₃	d ₃	d ₄	d ₂							
Hollow taper shank 32 E													
	25 05 E32	M 5	25	9.5	12	HSK 32	form E	-	12	A, B			
	50 05 E32	M 5	50	9.5	20	HSK 32	form E	-	12	A, B			
	 KMR-32 A > Page 406	 SCHLUESSELHSK32 B > Page 406											
Hollow taper shank 40 E													
	25 05 E40	M 5	25	9.5	12	HSK 40	form E	-	12	A, B			
	50 05 E40	M 5	50	9.5	20	HSK 40	form E	-	12	A, B			
	 KMR-40A A > Page 406	 SCHLUESSELHSK40 B > Page 406											
Adapters plain shank + flats													
	10 12 600	M 5	10	9.5	11.8	diam. 12	-	55	-	385			
	20 12 600	M 5	20	9.5	11.5	diam. 12	-	65	-	385			

Arbor and Adapter
Systems

catalogue no.

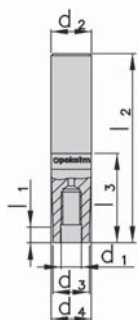
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Adapters plain shank



10 12 600 G

M 5

10

9.5

11.8

diam. 12

-

55

7.8

385

7

7

7

20 12 600 G

M 5

20

9.5

11.5

diam. 12

-

65

7.8

385

7

7

7

Plain shank | dense antivibration mat.

40 05 601

M 5

40

9.5

11.3

diam. 12

-

85

9

371-374

7

7

7

60 05 601

M 5

60

9.5

11.3

diam. 12

-

105

9

371-374

7

7

7

80 05 601

M 5

80

9.5

11.3

diam. 12

-

125

9

371-374

7

7

7

Reductions

08 40 781

M 5

40

9.5

13.8

M 8

-

-

7.8

314-318

7

7

7

313



FOR THREADED SHANK END MILL BODIES

M 8

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

1/5

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

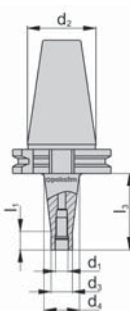
Form/DIN

l₂

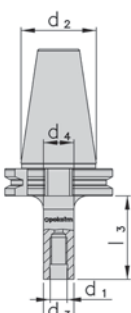
l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD | tapered

	25 08 750	M 8	25	13.8	15	SK 40	DIN 69871 AD	-	12	A, B	  
	50 08 750	M 8	50	13.8	23	SK 40	DIN 69871 AD	-	12	A, B	  
	75 08 750	M 8	75	13.8	25	SK 40	DIN 69871 AD	-	12	A, B	  
	100 08 750	M 8	100	13.8	30	SK 40	DIN 69871 AD	-	12	A, B	  
	 KBSK40-69872A A > Page 406	 KBSK40-69872B B > Page 406									

Int. taper 40 DIN 69 871 AD | cylindrical

	50 08 750 ZYL	M 8	50	13.8	13.8	SK 40	DIN 69871 AD	-	-	A, B	  
 KBSK40-69872A A > Page 406	 KBSK40-69872B B > Page 406										

Int. taper 40 MAS BT

	25 08 754	M 8	25	13.8	15	BT 40	JIS B 6339 AD	-	12		✓
	50 08 754	M 8	50	13.8	23	BT 40	JIS B 6339 AD	-	12		✓
	75 08 754	M 8	75	13.8	25	BT 40	JIS B 6339 AD	-	12		✓

Arbor and Adapter
Systems

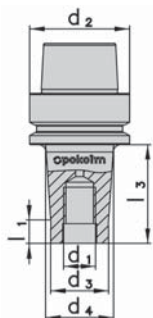
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Hollow taper shank 40 E



25 08 E40

M 8

25

13.8

15

HSK 40

form E

-

12

A, B



G 2.5

20.000

50 08 E40

M 8

50

13.8

23

HSK 40

form E

-

12

A, B



G 2.5

20.000

75 08 E40

M 8

75

13.8

25

HSK 40

form E

-

12

A, B

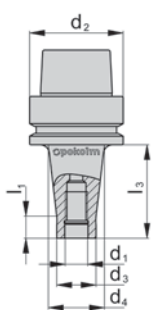


G 2.5

20.000

KMR-40A
A > Page 406SCHLUESSELHSK40
B > Page 406

Hollow taper shank 50 E



25 08 E50

M 8

25

13.8

15

HSK 50

form E

-

12

A, B



G 2.5

20.000

50 08 E50

M 8

50

13.8

23

HSK 50

form E

-

12

A, B



G 2.5

20.000

75 08 E50

M 8

75

13.8

25

HSK 50

form E

-

12

A, B



G 2.5

20.000

100 08 E50

M 8

100

13.8

30

HSK 50

form E

-

12

A, B

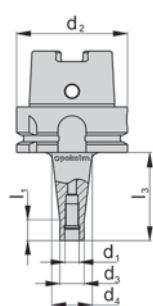


G 2.5

20.000

KMR-50A
A > Page 406SCHLUESSELHSK50
B > Page 406

Hollow taper shank 63 A



25 08 A63

M 8

25

13.8

15

HSK 63

form A

-

12

A, B



G 6.3

20.000

50 08 A63

M 8

50

13.8

23

HSK 63

form A

-

12

A, B



G 6.3

20.000

75 08 A63

M 8

75

13.8

25

HSK 63

form A

-

12

A, B



G 6.3

20.000

100 08 A63

M 8

100

13.8

30

HSK 63

form A

-

12

A, B

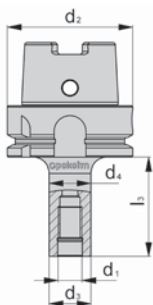


G 6.3

20.000

KMR-63A
A > Page 406SCHLUESSELHSK63
B > Page 406

Hollow taper shank 63 A | cylindrical



50 08 A63 ZYL

M 8

50

13.8

13.8

HSK 63

form A

-

-

A, B



G 6.3

20.000

KMR-63A
A > Page 406SCHLUESSELHSK63
B > Page 406



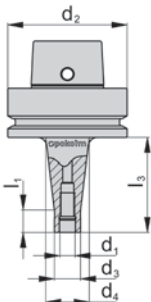
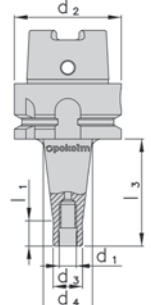
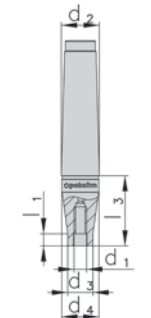
FOR THREADED SHANK END MILL BODIES

M 8

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

3/5

Arbor and Adapter Systems

Arbor and Adapter Systems		catalogue no.		Form/DIN							ref. pg. arbors ref. accessories features		
		d ₁	l ₃	d ₃	d ₄	d ₂		l ₂	l ₁				
Hollow taper shank 63 F													
	25 08 F63	M 8	25	13.8	15	HSK 63	form F	-	12		  		
	75 08 F63	M 8	75	13.8	25	HSK 63	form F	-	12		  		
Hollow taper shank 100 A													
	50 08 A100	M 8	50	13.8	23	HSK 100	form A	-	12	A, B	  		
	100 08 A100	M 8	100	13.8	30	HSK 100	form A	-	12	A, B	  		
	 KMR-100A A > Page 406				 SCHLUESSELHSK100 B > Page 406								
Morse taper shank adapters													
	20 670	M 8	20	13.8	18	MTS 2	-	-	-	336-339	 		
	40 670	M 8	40	13.8	18	MTS 2	-	-	8.5	336-339	 		
	60 670	M 8	60	13.8	18	MTS 2	-	-	8.5	336-339	 		
	80 670	M 8	80	13.8	24	MTS 3	-	-	8.5	336-339	 		
	100 670	M 8	100	13.8	24.1	MTS 3	-	-	8.5	336-339	 		

Arbor and Adapter
Systems

catalogue no.

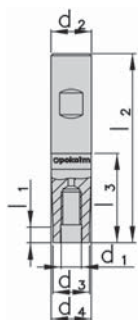
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Adapters plain shank + flats



20 16 600

M 8

20

13.8

15.8

diam.
16

-

68

7.8

375-378

✓

40 16 600

M 8

40

13.8

15.8

diam.
16

-

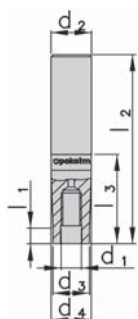
88

7.8

375-378

✓

Adapters plain shank



20 16 600 G

M 8

20

13.8

15.8

diam.
16

-

68

7.8

375-378

✓

40 16 600 G

M 8

40

13.8

15.8

diam.
16

-

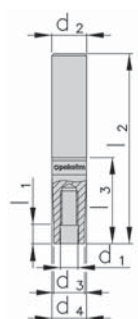
88

7.8

375-378

✓

Plain shank | dense antivibration mat.



40 08 601

M 8

40

14.2

15.3

diam.
16

-

88

9

375-378

✓

60 08 601

M 8

60

14.2

15.3

diam.
16

-

108

9

375-378

✓

80 08 601

M 8

80

14.2

15.3

diam.
16

-

128

9

375-378

✓

100 08 601

M 8

100

14.2

15.3

diam.
16

-

148

9

375-378

✓

120 08 601

M 8

120

14.2

15.3

diam.
16

-

168

9

375-378

✓

150 08 601

M 8

150

14.2

15.3

diam.
16

-

198

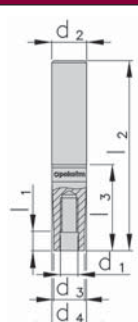
9

375-378

✓

Plain shank | solid carbide

NEW



40 08 606

M 8

40

14.2

15.3

diam.
16

-

88

9

375-378

✓

60 08 606

M 8

60

14.2

15.3

diam.
16

-

108

9

375-378

✓

80 08 606

M 8

80

14.2

15.3

diam.
16

-

128

9

375-378

✓

100 08 606

M 8

100

14.2

15.3

diam.
16

-

148

9

375-378

✓

120 08 606

M 8

120

14.2

15.3

diam.
16

-

168

9

375-378

✓



FOR THREADED SHANK END MILL BODIES

M 8

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

◀ 5/5

Arbor and Adapter Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

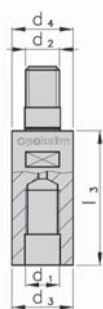
Form/DIN

l_2

l_1

ref. pg. arbors
ref. accessories
features

Extension adapters



08 40 780

M 8

40

13.8

13.8

M 8

-

-

-

314-318

✓

1

1

08 60 780

M 8

60

13.8

13.8

M 8

-

-

-

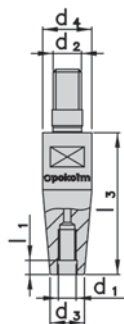
314-318

✓

1

1

Reductions



10 40 781

M 8

40

13.8

18

M 10

-

-

6.5

319-323

✓

1

1

12 60 781

M 8

60

13.8

21

M 12

-

-

7.8

324-329

✓

1

1

FOR THREADED SHANK END MILL BODIES

M 10

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request



1/5

Arbor and Adapter Systems

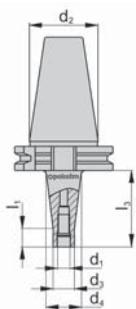
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD | tapered



25 10 750

M 10

25

18

23

SK 40

DIN 69871
AD

-

12

A, B

50 10 750

M 10

50

18

25

SK 40

DIN 69871
AD

-

12

A, B

75 10 750

M 10

75

18

30

SK 40

DIN 69871
AD

-

12

A, B

100 10 750

M 10

100

18

35

SK 40

DIN 69871
AD

-

12

A, B

125 10 750

M 10

125

18

40

SK 40

DIN 69871
AD

-

12

A, B

150 10 750

M 10

150

18

45

SK 40

DIN 69871
AD

-

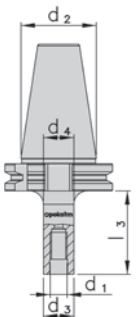
12

A, B

KB SK40-69872A
A > Page 406

KB SK40-69872B
B > Page 406

Int. taper 40 DIN 69 871 AD | cylindrical



50 10 750 ZYL

M 10

50

18

18

SK 40

DIN 69871
AD

-

-

A, B

75 10 750 ZYL

M 10

75

18

18

SK 40

DIN 69871
AD

-

-

A, B

100 10 750 ZYL

M 10

100

18

18

SK 40

DIN 69871
AD

-

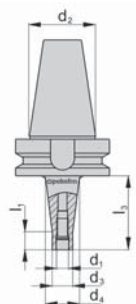
-

A, B

KB SK40-69872A
A > Page 406

KB SK40-69872B
B > Page 406

Int. taper 40 MAS BT



25 10 754

M 10

25

18

23

BT 40

JIS B 6339
AD

-

12

50 10 754

M 10

50

18

25

BT 40

JIS B 6339
AD

-

12

75 10 754

M 10

75

18

30

BT 40

JIS B 6339
AD

-

12

100 10 754

M 10

100

18

35

BT 40

JIS B 6339
AD

-

12

FOR THREADED SHANK END MILL BODIES

M 10



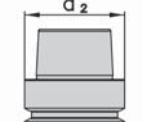
- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

2/5

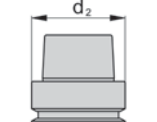
Arbor and Adapter Systems

catalogue no.	d ₁	l ₃	d ₃	d ₄	d ₂	Form/DIN	l ₂	l ₁	ref. pg. arbors	ref. accessories	features
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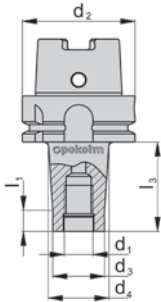
Hollow taper shank 40 E

	25 10 E40	M 10	25	18	23	HSK 40	form E	-	12	A, B	  
	50 10 E40	M 10	50	18	25	HSK 40	form E	-	12	A, B	  
	75 10 E40	M 10	75	18	30	HSK 40	form E	-	12	A, B	  
 KMR-40A A > Page 406	 SCHLUESSELHSK40 B > Page 406										

Hollow taper shank 50 E

	25 10 E50	M 10	25	18	23	HSK 50	form E	-	12	A, B	  
	50 10 E50	M 10	50	18	25	HSK 50	form E	-	12	A, B	  
	75 10 E50	M 10	75	18	30	HSK 50	form E	-	12	A, B	  
	100 10 E50	M 10	100	18	35	HSK 50	form E	-	12	A, B	  
	 KMR-50A A > Page 406	 SCHLUESSELHSK50 B > Page 406									

Hollow taper shank 63 A

	25 10 A63	M 10	25	18	23	HSK 63	form A	-	12	A, B	  
	50 10 A63	M 10	50	18	25	HSK 63	form A	-	12	A, B	  
	75 10 A63	M 10	75	18	30	HSK 63	form A	-	12	A, B	  
	100 10 A63	M 10	100	18	35	HSK 63	form A	-	12	A, B	  
	125 10 A63	M 10	125	18	38	HSK 63	form A	-	12	A, B	  
	150 10 A63	M 10	150	18	45	HSK 63	form A	-	12	A, B	  
	 KMR-63A A > Page 406	 SCHLUESSELHSK63 B > Page 406									

Arbor and Adapter
Systems

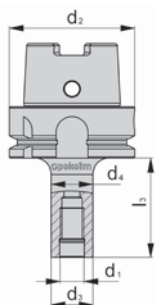
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A | cylindrical



50 10 A63 ZYL

M 10

50

18

18

HSK

63

form A

-

-

A, B

✓

HSM

G 6.3

20.000

100 10 A63 ZYL

M 10

100

18

18

HSK

63

form A

-

-

A, B

✓

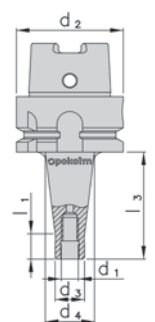
HSM

G 6.3

20.000

KMR-63A
A > Page 406SCHLUESSELHSK63
B > Page 406

Hollow taper shank 100 A



50 10 A100

M 10

50

18

25

HSK

100

form A

-

12

A, B

✓

HSM

G 10

8.000

75 10 A100

M 10

75

18

30

HSK

100

form A

-

12

A, B

✓

HSM

G 10

8.000

100 10 A100

M 10

100

18

35

HSK

100

form A

-

12

A, B

✓

HSM

G 10

8.000

150 10 A100

M 10

150

18

45

HSK

100

form A

-

12

A, B

✓

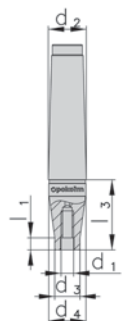
HSM

G 10

8.000

KMR-100A
A > Page 406SCHLUESSELHSK100
B > Page 406

Morse taper shank adapters



20 680

M 10

20

18

18

MTS

2

-

-

-

336-339

✓

HSM

40 680

M 10

40

18

18

MTS

2

-

-

-

336-339

✓

HSM

60 680

M 10

60

18

18

MTS

2

-

-

-

336-339

✓

HSM

80 680

M 10

80

18

24

MTS

3

-

-

8.5

336-339

✓

HSM

100 680

M 10

100

18

23.6

MTS

3

-

-

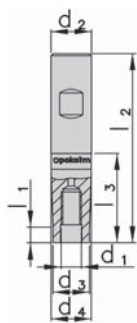
8.5

336-339

✓

HSM

Adapters plain shank + flats



25 20 600

M 10

25

18

19.8

diam.

20

-

75

7.8

379-381

✓

HSM

45 20 600

M 10

45

18

19.8

diam.

20

-

95

7.8

379-381

✓

HSM

FOR THREADED SHANK END MILL BODIES

M 10



- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

4/5

Arbor and Adapter Systems

catalogue no.					Form/DIN			ref. pg. arbors ref. accessories features		
	d ₁	l ₃	d ₃	d ₄	d ₂	l ₂	l ₁			

adapters plain shank

	25 20 600 G	M 10	25	18	19.8	diam. 20	-	75	7.8	379-381	✓	☐	☐
	45 20 600 G	M 10	45	18	19.8	diam. 20	-	95	7.8	379-381	✓	☐	☐

Plain shank | dense antivibration mat.

	60 10 601	M 10	60	18.5	19.3	diam. 20	-	110	9	379-381	✓	☐	☐
	80 10 601	M 10	80	18.5	19.3	diam. 20	-	130	9	379-381	✓	☐	☐
	100 10 601	M 10	100	18.5	19.3	diam. 20	-	150	9	379-381	✓	☐	☐
	120 10 601	M 10	120	18.5	19.3	diam. 20	-	170	9	379-381	✓	☐	☐
	140 10 601	M 10	140	18.5	19.3	diam. 20	-	190	9	379-381	✓	☐	☐

Plain shank | solid carbide

NEW

	60 10 606	M 10	60	18.5	19.3	diam. 20	-	110	9	379-381	✓	NEW	☐	☐
	80 10 606	M 10	80	18.5	19.3	diam. 20	-	130	9	379-381	✓	NEW	☐	☐
	100 10 606	M 10	100	18.5	19.3	diam. 20	-	150	9	379-381	✓	NEW	☐	☐
	120 10 606	M 10	120	18.5	19.3	diam. 20	-	170	9	379-381	✓	NEW	☐	☐
	140 10 606	M 10	140	18.5	19.3	diam. 20	-	190	9	379-381	✓	NEW	☐	☐

Arbor and Adapter
Systems

catalogue no.

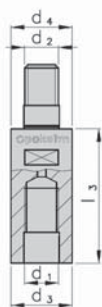
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Extension adapters



10 40 780

M 10

40

18

18

M 10

-

-

-

319-323



10 60 780

M 10

60

18

18

M 10

-

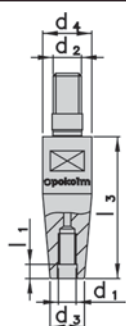
-

-

319-323



Reductions



12 40 781

M 10

40

18

21

M 12

-

-

7.8

324-329



16 60 781

M 10

60

18

29

M 16

-

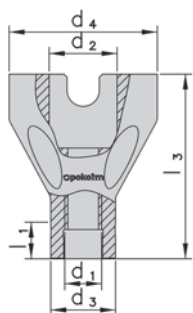
-

7.8

330-335



Reduction-adapters shell-tp to thread connect



60 22 M10 783

M 10

60

18

48

diam.
22

-

-

12

342-344
A


100 22 M10 783

M 10

100

18

48

diam.
22

-

-

12

342-344
A


60 27 M10 783

M 10

60

18

62

diam.
27

-

-

12

345-347
B


100 27 M10 783

M 10

100

18

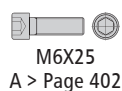
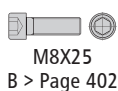
62

diam.
27

-

-

12

345-347
B

M6X25
A > Page 402

M8X25
B > Page 402

FOR THREADED SHANK END MILL BODIES

M 12



- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

1/6

Arbor and Adapter Systems

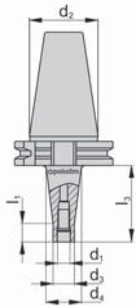
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

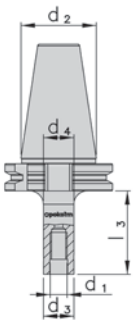
 l_2 l_1 ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD | tapered



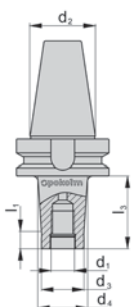
25 12 750	M 12	25	21	24	SK 40	DIN 69871 AD	-	12	A, B	
50 12 750	M 12	50	21	30	SK 40	DIN 69871 AD	-	12	A, B	
75 12 750	M 12	75	21	35	SK 40	DIN 69871 AD	-	12	A, B	
100 12 750	M 12	100	21	38	SK 40	DIN 69871 AD	-	12	A, B	
125 12 750	M 12	125	21	44	SK 40	DIN 69871 AD	-	12	A, B	
150 12 750	M 12	150	21	48	SK 40	DIN 69871 AD	-	12	A, B	
 KBSK40-69872A A > Page 406		 KBSK40-69872B B > Page 406								

SK 40 DIN 69 871 AD | cylindrical



50 12 750 ZYL	M 12	50	21	21	SK 40	DIN 69871 AD	-	-	A, B	
75 12 750 ZYL	M 12	75	21	21	SK 40	DIN 69871 AD	-	-	A, B	
100 12 750 ZYL	M 12	100	21	21	SK 40	DIN 69871 AD	-	-	A, B	
 KBSK40-69872A A > Page 406		 KBSK40-69872B B > Page 406								

Int. taper 40 MAS BT



25 12 754	M 12	25	21	24	BT 40	JIS B 6339 AD	-	12		
50 12 754	M 12	50	21	30	BT 40	JIS B 6339 AD	-	12		
75 12 754	M 12	75	21	35	BT 40	JIS B 6339 AD	-	12		
100 12 754	M 12	100	21	38	BT 40	JIS B 6339 AD	-	12		

Arbor and Adapter
Systems

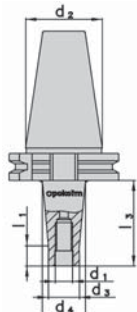
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

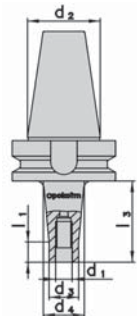
 l_2 l_1 ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 AD



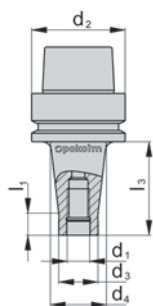
50 12 710	M 12	50	21	30	SK 50	DIN 69871 AD	-	12	A, B	 
100 12 710	M 12	100	21	38	SK 50	DIN 69871 AD	-	12	A, B	 
150 12 710	M 12	150	21	52	SK 50	DIN 69871 AD	-	12	A, B	 
200 12 710	M 12	200	21	68	SK 50	DIN 69871 AD	-	12	A, B	 
250 12 710	M 12	250	21	63	SK 50	DIN 69871 AD	-	12	A, B	 
300 12 710	M 12	300	21	68	SK 50	DIN 69871 AD	-	12	A, B	 
 KBSK50-69872A A > Page 406		 KBSK50-69872B B > Page 406								

Int. taper 50 MAS BT



50 12 714	M 12	50	21	30	BT 50	JIS B 6339 AD	-	12		 
100 12 714	M 12	100	21	38	BT 50	JIS B 6339 AD	-	12		 
150 12 714	M 12	150	21	52	BT 50	JIS B 6339 AD	-	12		 
200 12 714	M 12	200	21	58	BT 50	JIS B 6339 AD	-	12		 
250 12 714	M 12	250	21	63	BT 50	JIS B 6339 AD	-	12		 
300 12 714	M 12	300	21	68	BT 50	JIS B 6339 AD	-	12		 

Hollow taper shank 50 E



25 12 E50	M 12	25	21	24	HSK 50	form E	-	12	A, B	  
50 12 E50	M 12	50	21	30	HSK 50	form E	-	12	A, B	  
75 12 E50	M 12	75	21	35	HSK 50	form E	-	12	A, B	  
100 12 E50	M 12	100	21	38	HSK 50	form E	-	12	A, B	  


KMR-50A
A > Page 406


SCHLUESSELHSK50
B > Page 406

FOR THREADED SHANK END MILL BODIES

M 12



- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

◀ 3 / 6 ▶

Arbor and Adapter Systems

Arbor and Adapter
Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

Form/DIN

l_2

l_1

ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A

25 12 A63

M 12

25

21

24

HSK
63

form A

-

12

A, B

50 12 A63

M 12

50

21

30

HSK
63

form A

-

12

A, B

75 12 A63

M 12

75

21

35

HSK
63

form A

-

12

A, B

100 12 A63

M 12

100

21

38

HSK
63

form A

-

12

A, B

125 12 A63

M 12

125

21

43

HSK
63

form A

-

12

A, B

150 12 A63

M 12

150

21

45

HSK
63

form A

-

12

A, B

175 12 A63

M 12

175

21

50

HSK
63

form A

-

12

A, B

KMR-63A
A > Page 406

SCHLUESSELHSK63
B > Page 406

Hollow taper shank 63 form A | cylindrical

[illegible]

Arbor and Adapter
Systems

catalogue no.

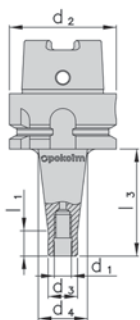
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 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

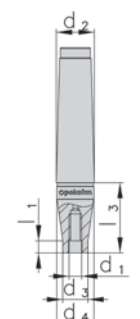
ref. pg. arbors
ref. accessories
features

Hollow taper shank 100 A



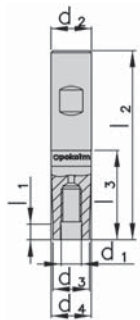
50 12 A100	M 12	50	21	30	HSK 100	form A	-	12	A, B	
100 12 A100	M 12	100	21	38	HSK 100	form A	-	12	A, B	
150 12 A100	M 12	150	21	52	HSK 100	form A	-	12	A, B	
200 12 A100	M 12	200	21	58	HSK 100	form A	-	12	A, B	
KMR-100A A > Page 406		SCHLUESSELHSK100 B > Page 406								

Morse taper shank adapter



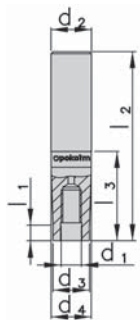
10 610	M 12	10	21	24	MTS 3	-	-	-	336-339	
30 610	M 12	30	21	23.6	MTS 3	-	-	8.5	336-339	
45 610	M 12	45	21	24.1	MTS 3	-	-	8.5	336-339	
60 610	M 12	60	21	24.1	MTS 3	-	-	8.5	336-339	
75 610	M 12	75	21	24.1	MTS 3	-	-	8.5	336-339	
95 610	M 12	95	21	24.1	MTS 3	-	-	8.5	336-339	
120 610	M 12	120	21	31.6	MTS 4	-	-	8.5	336-339	

Adapters plain shank + flats



30 25 600	M 12	30	21	24.9	diam. 25	-	86	7.8	382-383	
50 25 600	M 12	50	21	24.9	diam. 25	-	106	7.8	382-383	

Adapters plain shank



30 25 600 G	M 12	30	21	24.9	diam. 25	-	86	7.8	382-383	
50 25 600 G	M 12	50	21	24.8	diam. 25	-	106	7.8	382-383	

FOR THREADED SHANK END MILL BODIES

M 12



- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

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Arbor and Adapter Systems

catalogue no.

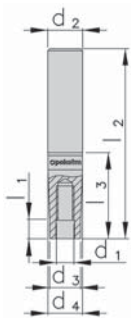
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

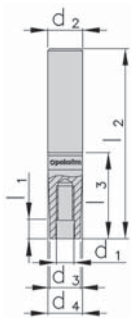
Plain shank | dense antivibration mat.



75 12 601	M 12	75	23	24.3	diam. 25	-	131	9	382-383	✓	##
100 12 601	M 12	100	23	24.3	diam. 25	-	156	9	382-383	✓	##
125 12 601	M 12	125	23	24.3	diam. 25	-	181	9	382-383	✓	##
150 12 601	M 12	150	23	24.3	diam. 25	-	206	9	382-383	✓	##
175 12 601	M 12	175	23	24.3	diam. 25	-	231	9	382-383	✓	##

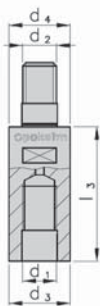
Plain shank | solid carbide

NEW



80 12 606	M 12	80	23	24.3	diam. 25	-	136	9	382-383	✓	NEW	##
100 12 606	M 12	100	23	24.3	diam. 25	-	156	9	382-383	✓	NEW	##
120 12 606	M 12	120	23	24.3	diam. 25	-	176	9	382-383	✓	NEW	##
140 12 606	M 12	140	23	24.3	diam. 25	-	196	9	382-383	✓	NEW	##
160 12 606	M 12	160	23	24.3	diam. 25	-	216	9	382-383	✓	NEW	##

Extension adapter



12 40 780	M 12	40	21	21	M 12	-	-	-	324-329	✓	##
12 60 780	M 12	60	21	21	M 12	-	-	-	324-329	✓	##

Arbor and Adapter
Systems

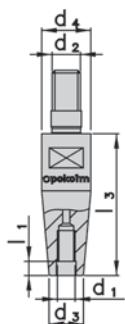
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Reductions



16 40 781

M 12

40

21

29

M 16

-

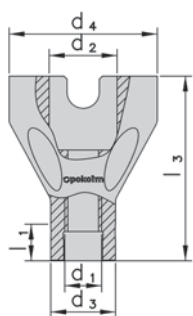
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-

330-335



Reduction-adapters shell-tp to thread connect



60 22 M12 783

M 12

60

21

48

diam.
22

-

-

12

342-344
A

100 22 M12 783

M 12

100

21

48

diam.
22

-

-

12

342-344
A

60 27 M12 783

M 12

60

21

62

diam.
27

-

-

12

345-347
B

100 27 M12 783

M 12

100

21

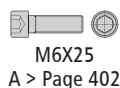
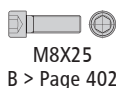
62

diam.
27

-

-

12

345-347
BM6X25
A > Page 402M8X25
B > Page 402



FOR THREADED SHANK END MILL BODIES

M 16

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

1/6

Arbor and Adapter Systems

catalogue no.

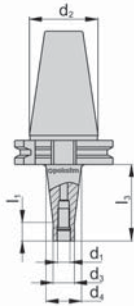
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 d_2

Form/DIN

 l_2
 l_1

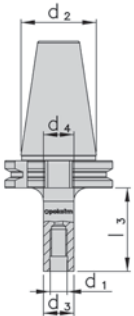
ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD | tapered



25 16 750	M 16	25	29	29	SK 40	DIN 69871 AD	-	-	A, B	  
50 16 750	M 16	50	29	34	SK 40	DIN 69871 AD	-	12	A, B	  
75 16 750	M 16	75	29	35	SK 40	DIN 69871 AD	-	12	A, B	  
100 16 750	M 16	100	29	40	SK 40	DIN 69871 AD	-	12	A, B	  
125 16 750	M 16	125	29	44	SK 40	DIN 69871 AD	-	12	A, B	  
150 16 750	M 16	150	29	48	SK 40	DIN 69871 AD	-	12	A, B	  
200 16 750	M 16	200	29	48	SK 40	DIN 69871 AD	-	12	A, B	  
250 16 750	M 16	250	29	48	SK 40	DIN 69871 AD	-	12	A, B	  
 KBSK40-69872A A > Page 406	 KBSK40-69872B B > Page 406									

Int. taper 40 DIN 69 871 AD | cylindrical



50 16 750 ZYL	M 16	50	29	29	SK 40	DIN 69871 AD	-	-	A, B	  
75 16 750 ZYL	M 16	75	29	29	SK 40	DIN 69871 AD	-	-	A, B	  
100 16 750 ZYL	M 16	100	29	29	SK 40	DIN 69871 AD	-	-	A, B	  
 KBSK40-69872A A > Page 406	 KBSK40-69872B B > Page 406									

Arbor and Adapter
Systems

catalogue no.

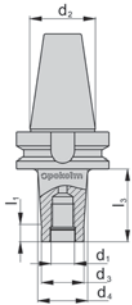
 d_1
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 d_3
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 d_2

Form/DIN

 l_2
 l_1

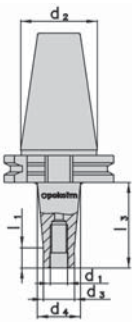
ref. pg. arbors
ref. accessories
features

Int. taper 40 MAS BT



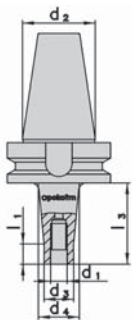
25 16 754	M 16	25	29	29	BT 40	JIS B 6339 AD	-	-		✓ HSM G6.3 (18.000)
50 16 754	M 16	50	29	34	BT 40	JIS B 6339 AD	-	12		✓ HSM G6.3 (18.000)
75 16 754	M 16	75	29	35	BT 40	JIS B 6339 AD	-	12		✓ HSM G6.3 (18.000)
100 16 754	M 16	100	29	40	BT 40	JIS B 6339 AD	-	12		✓ HSM G6.3 (18.000)
125 16 754	M 16	125	29	44	BT 40	JIS B 6339 AD	-	12		? HSM G6.3 (18.000)
150 16 754	M 16	150	29	48	BT 40	JIS B 6339 AD	-	12		? HSM G6.3 (18.000)

Int. taper 50 DIN 69 871 AD



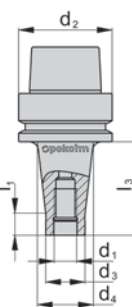
50 16 710	M 16	50	29	34	SK 50	DIN 69871 AD	-	12	A, B	✓ G10 (8.000)
100 16 710	M 16	100	29	40	SK 50	DIN 69871 AD	-	12	A, B	✓ G10 (8.000)
150 16 710	M 16	150	29	48	SK 50	DIN 69871 AD	-	12	A, B	✓ G10 (8.000)
200 16 710	M 16	200	29	50	SK 50	DIN 69871 AD	-	12	A, B	✓ G10 (8.000)
250 16 710	M 16	250	29	62	SK 50	DIN 69871 AD	-	12	A, B	✓ G10 (8.000)
300 16 710	M 16	300	29	68	SK 50	DIN 69871 AD	-	12	A, B	? G10 (8.000)
KBSK50-69872A A > Page 406		KBSK50-69872B B > Page 406								

Int. taper 50 MAS BT



50 16 714	M 16	50	29	34	BT 50	JIS B 6339 AD	-	12		✓ G10 (8.000)
100 16 714	M 16	100	29	40	BT 50	JIS B 6339 AD	-	12		✓ G10 (8.000)
150 16 714	M 16	150	29	48	BT 50	JIS B 6339 AD	-	12		✓ G10 (8.000)
200 16 714	M 16	200	29	58	BT 50	JIS B 6339 AD	-	12		? G10 (8.000)
250 16 714	M 16	250	29	62	BT 50	JIS B 6339 AD	-	12		? G10 (8.000)
300 16 714	M 16	300	29	68	BT 50	JIS B 6339 AD	-	12		? G10 (8.000)

Hollow taper shank 50 E



25 16 E50	M 16	25	29	29	HSK 50	form E	-	-	A, B	✓ HSM G2.5 (30.000)
50 16 E50	M 16	50	29	34	HSK 50	form E	-	12	A, B	? HSM G2.5 (30.000)
75 16 E50	M 16	75	29	35	HSK 50	form E	-	12	A, B	? HSM G2.5 (30.000)
KMR-50A A > Page 406		SCHLUESSELHSK50 B > Page 406								



FOR THREADED SHANK END MILL BODIES

M 16

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

3/6

Arbor and Adapter Systems

catalogue no.

d₁

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d₃

d₄

d₂

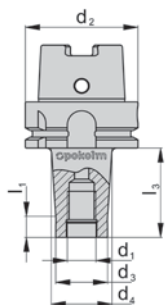
Form/DIN

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l₁

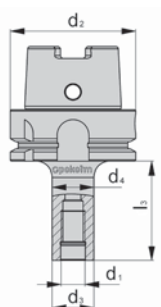
ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A



25 16 A63	M 16	25	29	29	HSK 63	form A	-	-	A, B	
50 16 A63	M 16	50	29	34	HSK 63	form A	-	12	A, B	
75 16 A63	M 16	75	29	35	HSK 63	form A	-	12	A, B	
100 16 A63	M 16	100	29	40	HSK 63	form A	-	12	A, B	
125 16 A63	M 16	125	29	44	HSK 63	form A	-	12	A, B	
150 16 A63	M 16	150	29	48	HSK 63	form A	-	12	A, B	
175 16 A63	M 16	175	29	50	HSK 63	form A	-	12	A, B	
200 16 A63	M 16	200	29	50	HSK 63	form A	-	12	A, B	
250 16 A63	M 16	250	29	50	HSK 63	form A	-	12	A, B	
 KMR-63A A > Page 406		 SCHLUESSELHSK63 B > Page 406								

Hollow taper shank 63 A | cylindrical



50 16 A63 ZYL	M 16	50	29	29	HSK 63	form A	-	-	A, B	
100 16 A63 ZYL	M 16	100	29	29	HSK 63	form A	-	-	A, B	
 KMR-63A A > Page 406		 SCHLUESSELHSK63 B > Page 406								

Arbor and Adapter
Systems

catalogue no.

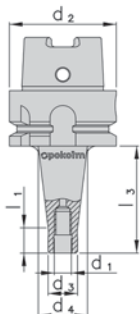
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 d_4
 d_2

Form/DIN

 l_2
 l_1

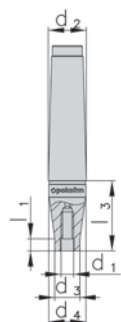
ref. pg. arbors
ref. accessories
features

Hollow taper shank 100 A


KMR-100A
A > Page 406

SCHLUESSELHSK100
B > Page 406

Morse taper shank adapter



10 630

M 16

10

29

31.5

MTS
4

-

-

-

336-339

35 630

M 16

35

29

31.5

MTS
4

-

-

8.5

336-339

50 630

M 16

50

29

31.6

MTS
4

-

-

8.5

336-339

65 630

M 16

65

29

31.6

MTS
4

-

-

8.5

336-339

80 630

M 16

80

29

31.6

MTS
4

-

-

8.5

336-339

95 630

M 16

95

29

31.5

MTS
4

-

-

8.5

336-339

100 650

M 16

100

29

44.5

MTS
5

-

-

8.5

336-339

120 650

M 16

120

29

44.5

MTS
5

-

-

8.5

336-339

150 650

M 16

150

29

44.7

MTS
5

-

-

8.5

336-339

180 650

M 16

180

29

44

MTS
5

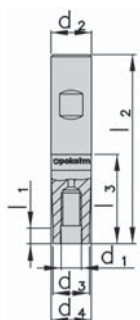
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-

8.5

336-339

Adapters with plain shanks + flats



50 32 600

M 16

50

29

31.8

diam.
32

-

110

7.8



FOR THREADED SHANK END MILL BODIES

M 16

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- arbors for left-hand cutting on request
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

◀ 5/6 ▶

Arbor and Adapter Systems

catalogue no.	d ₁	l ₃	d ₃	d ₄	d ₂	Form/DIN	l ₂	l ₁	ref. pg. arbors	ref. accessories	features
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Adapters plain shank

	50 32 600 G	M 16	50	29	31.8	diam. 32	-	110	7.8		✓

Plain shank | dense antivibration mat.

	100 16 601	M 16	100	31.5	34.3	diam. 36	-	160	9	384	✓
	150 16 601	M 16	150	31.5	34.3	diam. 36	-	210	9	384	✓
	200 16 601	M 16	200	31.5	34.3	diam. 36	-	260	9	384	✓
	250 16 601	M 16	250	31.5	34.3	diam. 36	-	310	9	384	?
	300 16 601	M 16	300	31.5	34.3	diam. 36	-	360	9	384	?

Plain shank | solid carbide

NEW

	100 16 606	M 16	100	31.5	34.3	diam. 36	-	160	9	384	✓ NEW
	150 16 606	M 16	150	31.5	34.3	diam. 36	-	210	9	384	✓ NEW
	200 16 606	M 16	200	31.5	34.3	diam. 36	-	260	9	384	✓ NEW
	250 16 606	M 16	250	31.5	34.3	diam. 36	-	310	9	384	✓ NEW
	300 16 606	M 16	300	31.5	34.3	diam. 36	-	360	9	384	✓ NEW

Arbor and Adapter
Systems

catalogue no.

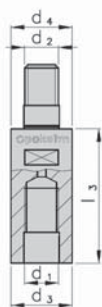
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Extension adapters



16 40 780

M 16

40

29

29

M 16

-

-

-

330-335

16 60 780

M 16

60

29

29

M 16

-

-

-

330-335

Reduction-adapters shell-tp to thread connect

60 22 M16 783

M 16

60

29

48

diam.
22

-

-

12

342-344
A

100 22 M16 783

M 16

100

29

48

diam.
22

-

-

12

342-344
A

60 27 M16 783

M 16

60

29

62

diam.
27

-

-

12

345-347
B

100 27 M16 783

M 16

100

29

62

diam.
27

-

-

12

345-347
B

M6X25
A > Page 402

M8X25
B > Page 402

335



FOR MORSE TAPER SHANKS

MTS 2 - MTS 5 | MTS 2

- arbors are pre-balanced; for balancing grades see features
- for morse-taper extensions without or with tang
- particularly slim form
- other dimensions on enquiry

Arbor and Adapter Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

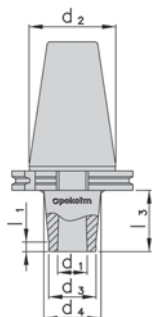
Form/DIN

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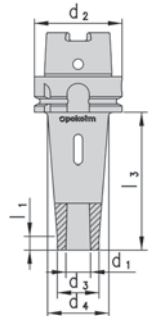
ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 A



40 2 710	MTS 2	50	30	36	SK 50	DIN 69871 AD	-	-	A, D, E, F, G, H	 
90 2 710	MTS 2	90	30	46	SK 50	DIN 69871 AD	-	-	B, D, E, F, G, H	 
140 2 710	MTS 2	140	30	56	SK 50	DIN 69871 AD	-	-	C, D, E, F, G, H	 
 M10X40 A > Page 402	 M10X90 B > Page 402				 M10X140 C > Page 402		 GWST-M5X8-914 D > Page 403		 1003 E > Page 404	
 KBSK50-69872A F > Page 406	 KBSK50-69872B G > Page 406				 ZGHM2414 H > Page 407					

Hollow taper shank 63 A



100 MK2 AL A63	MTS 2	100	30	44	HSK 63	form A	-	7.8	A, B	✓ HSM G 6.3 (20.000)
 KMR-63A A > Page 406	 SCHLUESSELHSK63 B > Page 406									

FOR MORSE TAPER SHANKS

MTS 2 - MTS 5 | MTS 3

- arbors are pre-balanced; for balancing grades see features
- for morse-taper extensions without or with tang
- particularly slim form
- other dimensions on enquiry



Arbor and Adapter Systems

catalogue no.

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l_3

d_3

d_4

d_2

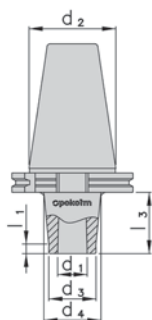
Form/DIN

l_2

l_1

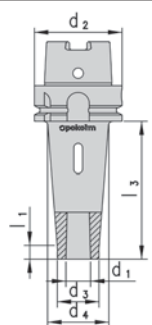
ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 A



50 3 710	MTS 3	50	38	46	SK 50	DIN 69871 AD	-	-	A, E, F, G, H, I	
100 3 710	MTS 3	100	38	56	SK 50	DIN 69871 AD	-	-	B, E, F, G, H, I	
150 3 710	MTS 3	150	38	62	SK 50	DIN 69871 AD	-	-	C, E, F, G, H, I	
200 3 710	MTS 3	200	38	70	SK 50	DIN 69871 AD	-	-	D, E, F, G, H, I	
	M12X40 A > Page 402		M12X90 B > Page 402		M12X135 C > Page 402		M12X185 D > Page 402		GWST-M5X8-914 E > Page 403	
	1003 F > Page 404		KBSK50-69872A G > Page 406		KBSK50-69872B H > Page 406		ZGHM2414 I > Page 407			

Hollow taper shank 63 A



120 MK3 AL A63	MTS 3	120	35	46	HSK 63	form A	-	7.8	A, B	
	KMR-63A A > Page 406		SCHLUESSELHSK63 B > Page 406							



FOR MORSE TAPER SHANKS

MTS 2 - MTS 5 | MTS 4

- arbors are pre-balanced; for balancing grades see features
- for morse-taper extensions without or with tang
- particularly slim form
- other dimensions on enquiry

Arbor and Adapter Systems

catalogue no.

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d_3

d_4

d_2

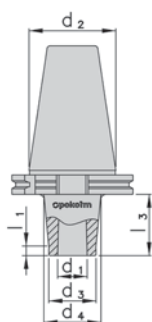
Form/DIN

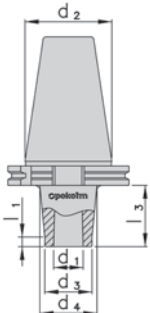
l_2

l_1

ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 A



	80 4 710	MTS 4	80	44	56	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	
	130 4 710	MTS 4	130	44	70	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	
	180 4 710	MTS 4	180	44	70	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	
	250 4 710	MTS 4	250	44	70	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	
	 M16X50 A > Page 402	 GWST-M5X8-914 B > Page 403					 1004 C > Page 404		 KBSK50-69872A D > Page 406		 KBSK50-69872B E > Page 406
	 ZGHM2414L F > Page 407										

FOR MORSE TAPER SHANKS

MTS 2 - MTS 5 | MTS 5

- arbors are pre-balanced; for balancing grades see features
- for morse-taper extensions without or with tang
- particularly slim form
- other dimensions on enquiry



Arbor and Adapter Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

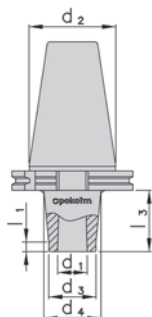
Form/DIN

l_2

l_1

ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 A



100 5 710	MTS 5	100	56	70	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	
150 5 710	MTS 5	150	56	70	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	
200 5 710	MTS 5	200	56	75	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	
	M20X50 A > Page 402		GWST-M5X8-914 B > Page 403		1005 C > Page 404		KBSK50-69872A D > Page 406		KBSK50-69872B E > Page 406	
	ZGHM3316L F > Page 407									



FOR SHELL-TYPE MILLING CUTTER BODIES

for bore diam. 16 mm

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request
- extent of supply includes screwed-in drive blocks

1/2 ▶

Arbor and Adapter Systems

catalogue no.

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d₂

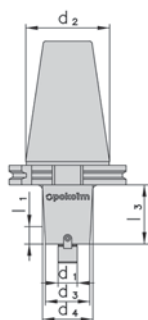
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD



25 16 750 Z	diam. 16	25	38	40	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	✓ HSM G6.3 (18.000)
50 16 750 Z	diam. 16	50	38	42	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	✓ HSM G6.3 (18.000)
75 16 750 Z	diam. 16	75	38	45	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	✓ HSM G6.3 (18.000)
100 16 750 Z	diam. 16	100	38	48	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	✓ HSM G6.3 (18.000)
125 16 750 Z	diam. 16	125	38	50	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	? HSM G6.3 (18.000)
150 16 750 Z	diam. 16	150	38	50	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	? HSM G6.3 (18.000)
175 16 750 Z	diam. 16	175	38	50	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	? HSM G6.3 (18.000)
200 16 750 Z	diam. 16	200	38	50	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	? HSM G6.3 (18.000)
M3X10 A > Page 402		NUTEN8X8 B > Page 406			KBSK40-69872A C > Page 406			KBSK40-69872B D > Page 406		

Int. taper 40 MAS BT



25 16 754 Z	diam. 16	25	38	40	BT 40	JIS B 6339 AD	-	7.8	A, B	  
50 16 754 Z	diam. 16	50	38	42	BT 40	JIS B 6339 AD	-	7.8	A, B	  
75 16 754 Z	diam. 16	75	38	45	BT 40	JIS B 6339 AD	-	7.8	A, B	  
100 16 754 Z	diam. 16	100	38	48	BT 40	JIS B 6339 AD	-	7.8	A, B	  
 M3X10 A > Page 402	 NUTEN8X8 B > Page 406									

Arbor and Adapter
Systems

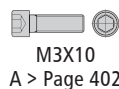
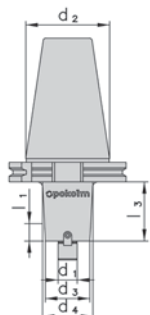
catalogue no.

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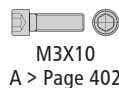
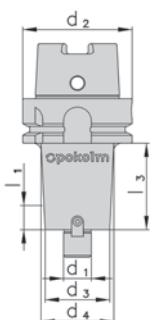
Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 AD

M3X10
A > Page 402NUTEN8X8
B > Page 406KBSK50-69872A
C > Page 406KBSK50-69872B
D > Page 406

Hollow taper shank 63 A

M3X10
A > Page 402NUTEN8X8
B > Page 406KMR-63A
C > Page 406SCHLUESSELHSK63
D > Page 406



FOR SHELL-TYPE MILLING CUTTER BODIES

for bore diam. 22 mm

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request
- extent of supply includes screwed-in drive blocks

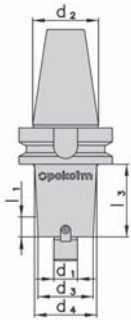
Attention: arbors for direct spindle mounting can only be used together with a centering arbor.

1/3 ▶

Arbor and Adapter Systems

catalogue no.		d ₁	l ₃	d ₃	d ₄	d ₂	Form/DIN	l ₂	l ₁	ref. pg. arbors	ref. accessories	features
Int. taper 40 DIN 69 871 AD												
	25 22 750	diam. 22	25	40	40	SK 40	DIN 69871 AD	-	-	A, B, C, D	✓ HSM	G6.3 (18.000)
	50 22 750	diam. 22	50	40	48	SK 40	DIN 69871 AD	-	7.8	A, B, C, D	✓ HSM	G6.3 (18.000)
	75 22 750	diam. 22	75	48	48	SK 40	DIN 69871 AD	-	-	A, B, C, D	✓ HSM	G6.3 (18.000)
	100 22 750	diam. 22	100	48	48	SK 40	DIN 69871 AD	-	-	A, B, C, D	✓ HSM	G6.3 (18.000)
	150 22 750	diam. 22	150	48	48	SK 40	DIN 69871 AD	-	-	A, B, C, D	✓ HSM	G6.3 (18.000)
	200 22 750	diam. 22	200	48	48	SK 40	DIN 69871 AD	-	-	A, B, C, D	✓ HSM	G6.3 (18.000)
M4X10 A > Page 402		NUTEN10X8 B > Page 406		KBSK40-69872A C > Page 406		KBSK40-69872B D > Page 406						

Int. taper 40 MAS BT

	25 22 754	diam. 22	25	40	40	BT 40	JIS B 6339 AD	-	7.8	A, B	  	
	50 22 754	diam. 22	50	40	40	BT 40	JIS B 6339 AD	-	7.8	A, B	  	
	75 22 754	diam. 22	75	48	48	BT 40	JIS B 6339 AD	-	7.8	A, B	  	
	100 22 754	diam. 22	100	48	48	BT 40	JIS B 6339 AD	-	7.8	A, B	  	
	150 22 754	diam. 22	150	48	48	BT 40	JIS B 6339 AD	-	7.8	A, B	  	
	200 22 754	diam. 22	200	48	48	BT 40	JIS B 6339 AD	-	7.8	A, B	  	
	 M4X10 A > Page 402		 NUTEN10X8 B > Page 406									

Arbor and Adapter
Systems

catalogue no.

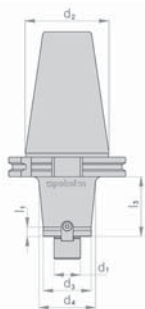
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 d_3
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Form/DIN

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 l_1

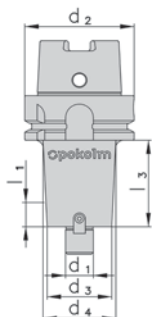
ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 AD



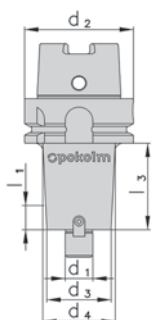
50 22 710	diam. 22	50	40	40	SK 50	DIN 69871 AD	-	-	A, B, C, D	
100 22 710.01	diam. 22	100	48	50	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	
150 22 710	diam. 22	150	48	62	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	
200 22 710	diam. 22	200	48	78	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	
	M4X10 A > Page 402		NUTEN10X8 B > Page 406		KBSK50-69872A C > Page 406		KBSK50-69872B D > Page 406			

Hollow taper shank 63 A



25 22 A63	diam. 22	25	40	40	HSK 63	form A	-	-	A, B, C, D	
50 22 A63	diam. 22	50	40	40	HSK 63	form A	-	-	A, B, C, D	
75 22 A63.01	diam. 22	75	48	50	HSK 63	form A	-	7.8	A, B, C, D	
100 22 A63.01	diam. 22	100	48	50	HSK 63	form A	-	7.8	A, B, C, D	
150 22 A63	diam. 22	150	48	48	HSK 63	form A	-	7.8	A, B, C, D	
	M4X10 A > Page 402		NUTEN10X8 B > Page 406		KMR-63A C > Page 406		SCHLUESSELHSK63 D > Page 406			

Hollow taper shank 100 A



50 22 A100	diam. 22	50	40	40	HSK 100	form A	-	-	A, B, C, D	
75 22 A100	diam. 22	75	48	48	HSK 100	form A	-	-	A, B, C, D	
100 22 A100	diam. 22	100	48	50	HSK 100	form A	-	7.8	A, B, C, D	
150 22 A100	diam. 22	150	48	50	HSK 100	form A	-	7.8	A, B, C, D	
200 22 A100	diam. 22	200	48	50	HSK 100	form A	-	7.8	A, B, C, D	
	M4X10 A > Page 402		NUTEN10X8 B > Page 406		KMR-100A C > Page 406		SCHLUESSELHSK100 D > Page 406			

FOR SHELL-TYPE MILLING CUTTER BODIES

for bore diam. 27 mm

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request
- extent of supply includes screwed-in drive blocks

Attention: arbors for direct spindle mounting can only be used together with a centering arbor.



1/3 ▶

Arbor and Adapter Systems

catalogue no.

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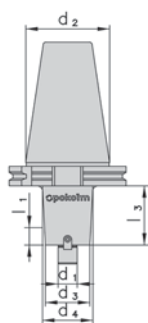
Form/DIN

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l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD



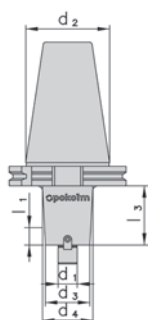
15 27 750	diam. 27	15	48	48	SK 40	DIN 69871 AD	-	-	A, B, C, D	  
50 27 750	diam. 27	50	48	48	SK 40	DIN 69871 AD	-	-	A, B, C, D	  
75 27 750	diam. 27	75	48	48	SK 40	DIN 69871 AD	-	-	A, B, C, D	  
100 27 750	diam. 27	100	48	48	SK 40	DIN 69871 AD	-	-	A, B, C, D	  
 M5X12 A > Page 402	 NUTEN12X8 B > Page 406			 KBSK40-69872A C > Page 406			 KBSK40-69872B D > Page 406			

Int. taper 40 MAS BT



15 27 754	diam. 27	15	48	48	BT 40	JIS B 6339 AD	-	-	A, B	  
50 27 754	diam. 27	50	48	48	BT 40	JIS B 6339 AD	-	-	A, B	  
75 27 754	diam. 27	75	48	48	BT 40	JIS B 6339 AD	-	-	A, B	  
100 27 754	diam. 27	100	48	48	BT 40	JIS B 6339 AD	-	-	A, B	  
 M5X12 A > Page 402	 NUTEN12X8 B > Page 406									

Int. taper 50 DIN 69 871 AD



50 27 710	diam. 27	50	62	62	SK 50	DIN 69871 AD	-	-	A, B, C, D	  G10 8.000
100 27 710	diam. 27	100	62	70	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	  G10 8.000
150 27 710	diam. 27	150	62	76	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	  G10 8.000
200 27 710	diam. 27	200	62	76	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	  G10 8.000
250 27 710	diam. 27	250	62	76	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	  G10 8.000
 M5X16 A > Page 402		 NUTEN12X12/2 B > Page 406			 KBSK50-69872A C > Page 406			 KBSK50-69872B D > Page 406		



FOR SHELL-TYPE MILLING CUTTER BODIES

for bore diam. 27 mm

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request
- extent of supply includes screwed-in drive blocks

Attention: arbors for direct spindle mounting can only be used together with a centering arbor.

◀ 2/3 ▶

Arbor and Adapter Systems

catalogue no.

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d_2

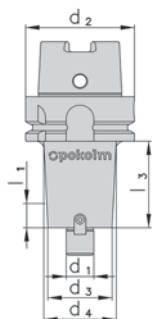
Form/DIN

l_2

l_1

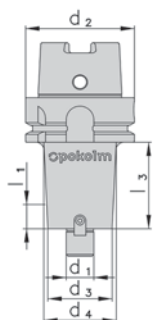
ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A



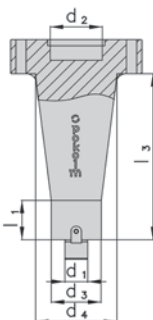
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50 27 A63	diam. 27	50	48	48	HSK 63	form A	-	-	A, B, C, D	  
75 27 A63	diam. 27	75	48	48	HSK 63	form A	-	-	A, B, C, D	  
100 27 A63	diam. 27	100	48	48	HSK 63	form A	-	-	A, B, C, D	  
 M5X12 A > Page 402	 NUTEN12X8 B > Page 406			 KMR-63A C > Page 406			 SCHLUESSELHSK63 D > Page 406			

Hollow taper shank 100 A



50 27 A100	diam. 27	50	62	62	HSK 100	form A	-	-	A, B, C, D	  
100 27 A100	diam. 27	100	62	71	HSK 100	form A	-	7.8	A, B, C, D	  
150 27 A100	diam. 27	150	62	80	HSK 100	form A	-	7.8	A, B, C, D	  
200 27 A100	diam. 27	200	62	80	HSK 100	form A	-	7.8	A, B, C, D	  
 MSX16 A > Page 402	 NUTEN12X12/2 B > Page 406			 KMR-100A C > Page 406			 SCHLUES- SELHSK100 D > Page 406			

for direct spindle mounting



200 27 740	diam. 27	200	62	78	diam. 50	direct mounting	-	38	395 A, B	 
250 27 740	diam. 27	250	62	82	diam. 50	direct mounting	-	38	395 A, B	 
300 27 740	diam. 27	300	62	86	diam. 50	direct mounting	-	38	395 A, B	 
350 27 740	diam. 27	350	62	90	diam. 50	direct mounting	-	38	395 A, B	 
400 27 740	diam. 27	400	62	95	diam. 50	direct mounting	-	38	395 A, B	 
 M5X16 A > Page 402	 NUTEN12X12/2 B > Page 406									

Arbor and Adapter
Systems

catalogue no.

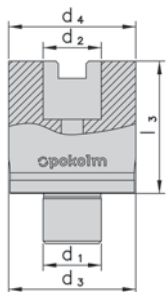
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Shell-type extensions



50 27 782

diam.
27

50

62

62

diam.
27

-

-

-

345-347
A, B, C


100 27 782

diam.
27

100

62

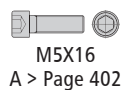
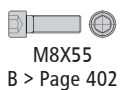
62

diam.
27

-

-

-

345-347
A, B, C

M5X16
A > Page 402

M8X55
B > Page 402

NUTEN12X12/2
C > Page 406



FOR SHELL-TYPE MILLING CUTTER BODIES

for bore diam. 32

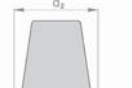
- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request
- extent of supply includes screwed-in drive blocks

Attention: arbors for direct spindle mounting can only be used together with a centering arbor.

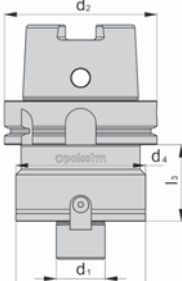
Arbor and Adapter Systems

catalogue no.	d ₁	l ₃	d ₃	d ₄	d ₂	Form/DIN	l ₂	l ₁	ref. pg. arbors	ref. accessories	features
---------------	----------------	----------------	----------------	----------------	----------------	----------	----------------	----------------	-----------------	------------------	----------

Int. taper shank 50 DIN 69 871 AD

	50 32 710	diam. 32	50	95	78	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	
	100 32 710	diam. 32	100	95	78	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	
	150 32 710	diam. 32	150	95	78	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	
	200 32 710	diam. 32	200	95	78	SK 50	DIN 69871 AD	-	7.8	A, B, C, D	
 M5X16 A > Page 402	 NUTEN14X14 B > Page 406				 KBSK50-69872A C > Page 406				 KBSK50-69872B D > Page 406		

Hollow taper shanks 100 AD

	50 32 A100	diam. 32	50	85	85	HSK 100	form A	-	-	A, B, C, D	
	100 32 A100	diam. 32	100	85	85	HSK 100	form A	-	-	A, B, C, D	
	150 32 A100	diam. 32	150	85	85	HSK 100	form A	-	-	A, B, C, D	
 M5X16 A > Page 402	 NUTEN14X14 B > Page 406			 KMR-100A C > Page 406			 SCHLUESSELHSK100 D > Page 406				

for direct spindle mounting

	100 32 740	diam. 32	100	85	98	diam. 50	direct mounting	-	38	395 A, B	
	150 32 740	diam. 32	150	85	98	diam. 50	direct mounting	-	38	395 A, B	
	200 32 740	diam. 32	200	85	98	diam. 50	direct mounting	-	38	395 A, B	
	250 32 740	diam. 32	250	90	105	diam. 50	direct mounting	-	38	395 A, B	
	300 32 740	diam. 32	300	90	110	diam. 50	direct mounting	-	38	395 A, B	
	350 32 740	diam. 32	350	90	117	diam. 50	direct mounting	-	38	395 A, B	
	400 32 740	diam. 32	400	90	124	diam. 50	direct mounting	-	38	395 A, B	

FOR SHELL-TYPE MILLING CUTTER BODIES

for bore diam. 40 mm

- Arbors are pre-balanced already, balancing grades see under features
- SK- and BT arbors with coolant supply through collar: on request
- other dimensions: on request
- extent of delivery: inclusive screwed-in drive blocks

Attention: arbors for direct spindle mounting can only be used together with a centering arbor.



Arbor and Adapter Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

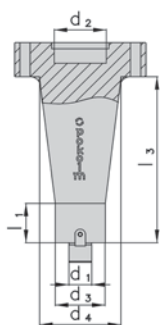
Form/DIN

l_2

l_1

ref. pg. arbors
ref. accessories
features

for direct spindle mounting



100 40 740	diam. 40	100	100	124	diam. 50	direct mounting	-	38	395 A, B	
150 40 740	diam. 40	150	100	124	diam. 50	direct mounting	-	38	395 A, B	
200 40 740	diam. 40	200	100	124	diam. 50	direct mounting	-	38	395 A, B	
	M6X16 A > Page 402			NUTEN16X16 B > Page 406						



FOR SHRINKING PROCESSES

for diam. 3

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

1/2 ▶

Arbor and Adapter Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

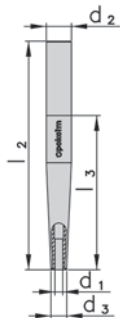
Form/DIN

l_2

l_1

ref. pg. arbors
ref. accessories
features

Plain shank



112 03 604 S

diam.
3

112

8

16

diam.
16

-

160

-

375-378

✓

115 03 604 S

diam.
3

115

8

12

diam.
12

-

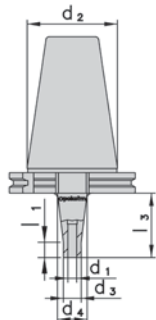
160

-

385

✓

Int. taper 40 DIN 69 871 AD



50 03 750 S.01

diam.
3

50

9

15.6

SK 40

DIN 69871
AD

-

7.8

A, B

✓

100 03 750 S.01

diam.
3

100

9

23.5

SK 40

DIN 69871
AD

-

7.8

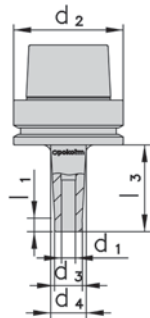
A, B

✓


KBSK40-69872A
A > Page 406


KBSK40-69872B
B > Page 406

Hollow taper shank 40 E



40 03 E40 S.01

diam.
3

40

9

14

HSK
40

form E

-

7.8

A, B

✓

70 03 E40 S.01

diam.
3

70

9

18.79

HSK
40

form E

-

7.8

A, B

✓


KMR-40A
A > Page 406


SCHLUESSELHSK40
B > Page 406

Arbor and Adapter
Systems

catalogue no.

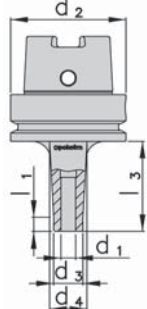
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Hollow taper shank 40 EC



40 03 EC 40 S.01

diam.
3

40

9

14.07

HSK
40

form C+E

-

7.8

7 HSM G 2.5
(20.000)

70 03 EC 40 S.01

diam.
3

70

9

18.79

HSK
40

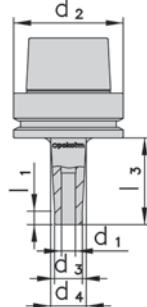
form C+E

-

7.8

7 HSM G 2.5
(20.000)

Hollow taper shank 50 E



50 03 E50 S.01

diam.
3

50

9

15.6

HSK
50

form E

-

7.8

A, B

7 HSM G 2.5
(20.000)

100 03 E50 S.01

diam.
3

100

9

23.51

HSK
50

form E

-

7.8

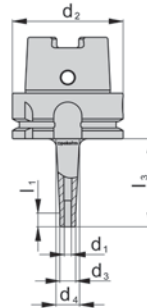
A, B

7 HSM G 2.5
(20.000)

KMR-50A
A > Page 406

SCHLUESSELHSK50
B > Page 406

Hollow taper shank 63 A



50 03 A63 S.01

diam.
3

50

9

15.6

HSK
63

form A

-

7.8

A, B

7 HSM G 6.3
(20.000)

100 03 A63 S.01

diam.
3

100

9

23.5

HSK
63

form A

-

7.8

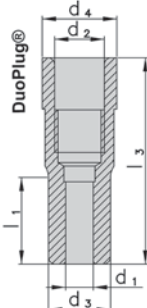
A, B

7 HSM G 6.3
(20.000)

KMR-63A
A > Page 406

SCHLUESSELHSK63
B > Page 406

DuoPlug®



30 03 07 SG

diam.
3

30

7

10.8

M 7

-

-

10.4

310-311

7 HSM G 6.3
(20.000)

35 03 10 SG

diam.
3

35

7

15

M 10

-

-

-

310-311

7 HSM G 6.3
(20.000)



FOR SHRINKING PROCESSES

for diam. 4

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

1/4 ▶

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

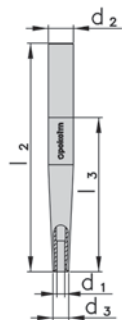
Form/DIN

l₂

l₁

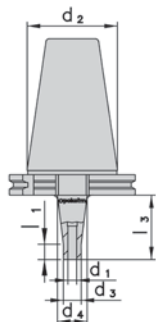
ref. pg. arbors
ref. accessories
features

Plain shank



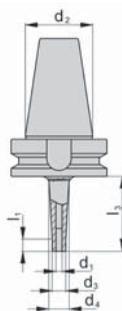
112 04 604 S	diam. 4	112	9	16	diam. 16	-	160	-	375-378	7	11
115 04 604 S.01	diam. 4	115	10.5	12	diam. 12	-	160	-	385	7	11

Int. taper 40 DIN 69 871 AD



50 04 750 S.01	diam. 4	50	10.5	14.9	SK 40	DIN 69871 AD	-	7.8	A, B	   
75 04 750 S.01	diam. 4	75	10.5	17.54	SK 40	DIN 69871 AD	-	7.8	A, B	   
100 04 750 S.01	diam. 4	100	10.5	20.16	SK 40	DIN 69871 AD	-	7.8	A, B	   
 KBSK40-69872A A > Page 406	 KBSK40-69872B B > Page 406									

Int. taper 40 MAS BT



50 04 754 S.01	diam. 4	50	10.5	14.9	BT 40	JIS B 6339 AD	-	7.8		✓	11	HSM	G 6.3 (18.000)
100 04 754 S.01	diam. 4	100	10.5	20.16	BT 40	JIS B 6339 AD	-	7.8		7	11	HSM	G 6.3 (18.000)

Arbor and Adapter
Systems

catalogue no.

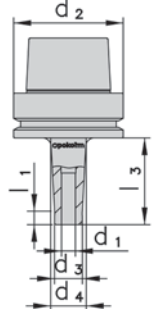
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Hollow taper shank 32 E



40 04 E32 S.01

diam.
4

40

10.5

13.87

HSK
32

form E

-

7.8

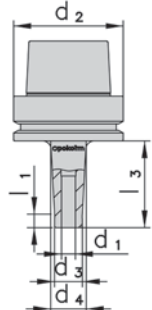
A, B



KMR-32
A > Page 406

SCHLUESSELHSK32
B > Page 406

Hollow taper shank 40 E



40 04 E40 S.01

diam.
4

40

10.5

13.9

HSK
40

form E

-

7.8

A, B



70 04 E40 S.01

diam.
4

70

10.5

17.02

HSK
40

form E

-

7.8

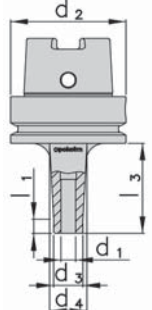
A, B



KMR-40A
A > Page 406

SCHLUESSELHSK40
B > Page 406

Hollow taper shank 40 EC



40 04 EC 40 S.01

diam.
4

40

10.5

13.87

HSK
40

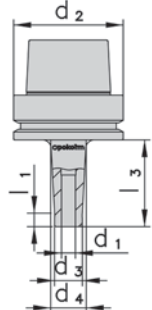
form C+E

-

7.8



Hollow taper shank 50 E



50 04 E50 S.01

diam.
4

50

10.5

14.92

HSK
50

form E

-

7.8

A, B



100 04 E50 S.01

diam.
4

100

10.5

20.1

HSK
50

form E

-

7.8

A, B



150 04 E50 S

diam.
4

150

9

24

HSK
50

form E

-

7.8

A, B



KMR-50A
A > Page 406

SCHLUESSELHSK50
B > Page 406



FOR SHRINKING PROCESSES

for diam. 4

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

3/4

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

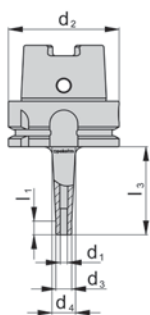
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A



50 04 A63 S.01

diam.
4

50

10.5

14.92

HSK
63

form A

-

7.8

A, B

✓ HSM G 6.3
(20.000)

75 04 A63 S.01

diam.
4

75

10.5

17.54

HSK
63

form A

-

7.8

A, B

✓ HSM G 6.3
(20.000)

100 04 A63 S.01

diam.
4

100

10.5

20.16

HSK
63

form A

-

7.8

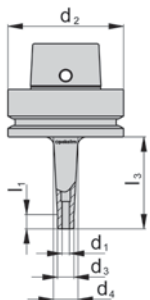
A, B

✓ HSM G 6.3
(20.000)

KMR-63A
A > Page 406

SCHLUESSELHSK63
B > Page 406

Hollow taper shank 63 F



50 04 F63 S

diam.
4

50

9

14

HSK
63

form F

-

7.8

⚠ HSM G 2.5
(20.000)

100 04 F63 S

diam.
4

100

9

19

HSK
63

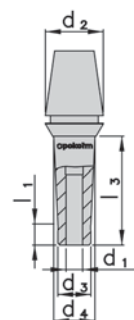
form F

-

7.8

⚠ HSM G 2.5
(20.000)

ER 20



40 04 674 S

diam.
4

40

12

15

ER 20

-

-

3

386-387

✓ HSM

60 04 674 S

diam.
4

60

9

15.8

ER 20

-

-

7.8

386-387

✓ HSM

80 04 674 S

diam.
4

80

12

15

ER 20

-

-

3

386-387

⚠ HSM

Arbor and Adapter
Systems

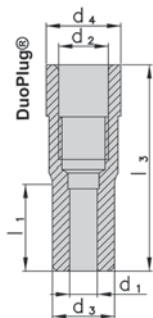
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

DuoPlug®



30 04 07 SG

diam.
4

30

9

10.8

M 7

-

-

12.6

310-311



35 04 10 SG

diam.
4

35

9

15

M 10

-

-

-

310-311



45 04 12 SG

diam.
4

45

9

18.5

M 12

-

-

-

310-311





FOR SHRINKING PROCESSES

for diam. 6

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

1/5

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

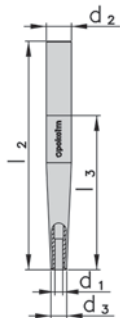
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Plain shank



112 06 604 S

diam. 6

112

11

16

diam. 16

-

160

-

375-378

✓

■

■

115 06 604 S

diam. 6

115

11

12

diam. 12

-

160

-

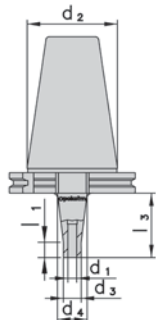
385

✓

■

■

Int. taper 40 DIN 69 871 AD



50 06 750 S

diam. 6

50

12

16.4

SK 40

DIN 69871 AD

-

7.8

A, B

✓

■

■

HSM

G 6.3

18.000

75 06 750 S

diam. 6

75

12

19

SK 40

DIN 69871 AD

-

7.8

A, B

✓

■

■

HSM

G 6.3

18.000

100 06 750 S

diam. 6

100

12

21.7

SK 40

DIN 69871 AD

-

7.8

A, B

✓

■

■

HSM

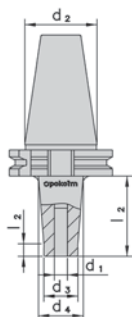
G 6.3

18.000

KBSK40-69872A
A > Page 406

KBSK40-69872B
B > Page 406

Int. taper 40 DIN 69 871 AD | re-inforced version



50 06 750 SB

diam. 6

50

21

27.6

SK 40

DIN 69871 AD

-

7.8

A, B

✓

■

■

HSM

G 6.3

18.000

100 06 750 SB

diam. 6

100

21

35.5

SK 40

DIN 69871 AD

-

7.8

A, B

✓

■

■

HSM

G 6.3

18.000

KBSK40-69872A
A > Page 406

KBSK40-69872B
B > Page 406

Arbor and Adapter
Systems

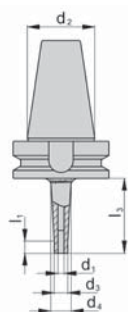
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

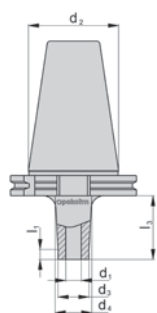
 l_2 l_1 ref. pg. arbors
ref. accessories
features

Int. taper 40 MAS BT



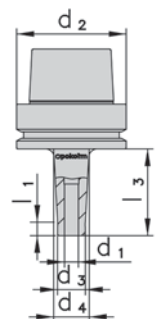
50 06 754 S	diam. 6	50	12	16	BT 40	JIS B 6339 AD	-	7.8		
100 06 754 S	diam. 6	100	12	21.7	BT 40	JIS B 6339 AD	-	7.8		

Int. taper 50 DIN 69 871 AD



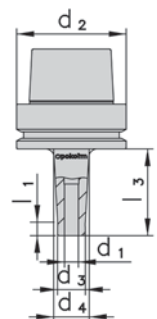
50 06 710 S	diam. 6	50	12	17	SK 50	DIN 69871 AD	-	7.8	A, B	
100 06 710 S	diam. 6	100	12	21.7	SK 50	DIN 69871 AD	-	7.8	A, B	
150 06 710 S	diam. 6	150	12	27	SK 50	DIN 69871 AD	-	7.8	A, B	
200 06 710 S	diam. 6	200	12	32	SK 50	DIN 69871 AD	-	7.8	A, B	
KBSK50-69872A A > Page 406		KBSK50-69872B B > Page 406								

Hollow taper shank 32 E



40 06 E32 S	diam. 6	40	12	15.4	HSK 32	form E	-	7.8	A, B	
70 06 E32 S	diam. 6	70	12	19	HSK 32	form E	-	7.8	A, B	
KMR-32 A > Page 406		SCHLUESSELHSK32 B > Page 406								

Hollow taper shank 40 E



40 06 E40 S	diam. 6	40	12	15.4	HSK 40	form E	-	7.8	A, B	
70 06 E40 S	diam. 6	70	12	18.5	HSK 40	form E	-	7.8	A, B	
100 06 E40 S	diam. 6	100	12	22	HSK 40	form E	-	7.8	A, B	
KMR-40A A > Page 406		SCHLUESSELHSK40 B > Page 406								



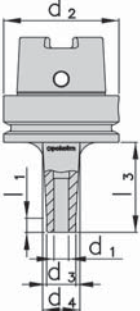
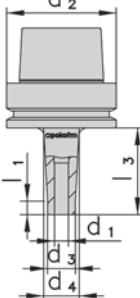
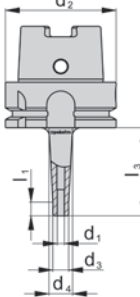
FOR SHRINKING PROCESSES

for diam. 6

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

3/5

Arbor and Adapter Systems

Arbor and Adapter Systems		catalogue no.										ref. pg. arbors		ref. accessories		features	
		d ₁	l ₃	d ₃	d ₄	d ₂	Form/DIN	l ₂	l ₁								
Hollow taper shank 40 EC																	
	40 06 EC 40 S	diam. 6	40	12	15.4	HSK 40	form C+E	-	7.8					G 2.5	(30.000)		
	70 06 EC 40 S	diam. 6	70	12	19	HSK 40	form C+E	-	7.8					G 2.5	(30.000)		
	100 06 EC 40 S	diam. 6	100	12	22	HSK 40	form C+E	-	7.8					G 2.5	(30.000)		
Hollow taper shank 50 E																	
	50 06 E50 S	diam. 6	50	12	16.4	HSK 50	form E	-	7.8		A, B			G 2.5	(30.000)		
	100 06 E50 S	diam. 6	100	12	21.6	HSK 50	form E	-	7.8		A, B			G 2.5	(30.000)		
	150 06 E50 S	diam. 6	150	12	27	HSK 50	form E	-	7.8		A, B			G 2.5	(30.000)		
		KMR-50A A > Page 406															
		SCHLUESSELHSK50 B > Page 406															
Hollow taper shank 63 A																	
	50 06 A63 S	diam. 6	50	12	16.4	HSK 63	form A	-	7.8		A, B			G 6.3	(30.000)		
	75 06 A63 S	diam. 6	75	12	19	HSK 63	form A	-	7.8		A, B			G 6.3	(30.000)		
	100 06 A63 S	diam. 6	100	12	21.7	HSK 63	form A	-	7.8		A, B			G 6.3	(30.000)		
		KMR-63A A > Page 406															
		SCHLUESSELHSK63 B > Page 406															

Arbor and Adapter
Systems

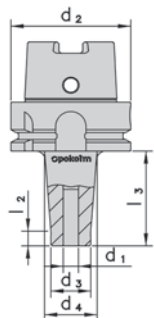
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A | re-inforced version

KMR-63A
A > Page 406SCHLUESSELHSK63
B > Page 406

50 06 A63 SB

diam.
6

50

21

27.6

HSK
63

form A

-

7.8

A, B



100 06 A63 SB

diam.
6

100

21

35.5

HSK
63

form A

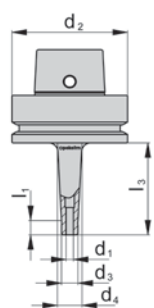
-

7.8

A, B



Hollow taper shank 63 F



50 06 F63 S

diam.
6

50

12

17

HSK
63

form F

-

7.8



100 06 F63 S

diam.
6

100

12

22

HSK
63

form F

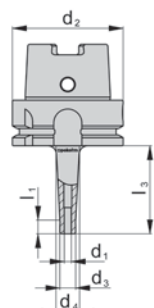
-

7.8



Hollow taper shank 100 A

NEW



100 06 A100 S

diam.
6

100

12

22

HSK
100

form A

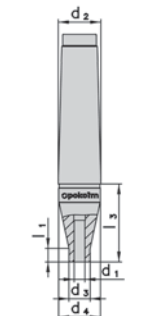
-

7.8

A, B

KMR-100A
A > Page 406SCHLUESSELHSK100
B > Page 406

Morse taper shank adapters



50 06 MK2 S

diam.
6

50

12

18

MTS
2

-

-

7.8

336-339



50 06 MK3 S

diam.
6

50

12

24

MTS
3

-

-

7.8

336-339



100 06 MK2 S

diam.
6

100

12

18

MTS
2

-

-

7.8

336-339



150 06 MK3 S

diam.
6

150

12

24

MTS
3

-

-

7.8

336-339





FOR SHRINKING PROCESSES

for diam. 6

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

◀ 5/5

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

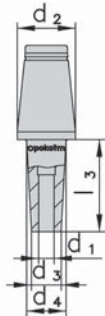
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Short taper shank



100 06 675 S

diam. 6

100

12

21

KK 3

-

-

-

394

△

■

■

125 06 675 S

diam. 6

125

12

22

KK 3

-

-

-

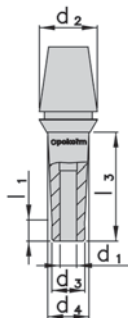
394

△

■

■

ER 20



20 06 674 S

diam. 6

20

14

14

ER 20

-

-

-

386-387

△

■

■

HSM

40 06 674 S

diam. 6

40

12

15

ER 20

-

-

7.8

386-387

✓

■

■

HSM

60 06 674 S

diam. 6

60

14

14

ER 20

-

-

-

386-387

△

■

■

HSM

80 06 674 S

diam. 6

80

12

15

ER 20

-

-

7.8

386-387

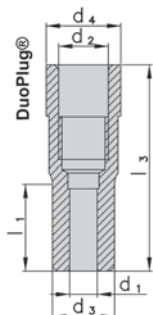
△

■

■

HSM

DuoPlug®



35 06 10 SG

diam. 6

35

12

15

M 10

-

-

-

310-311

✓

■

■

HSM

45 06 12 SG

diam. 6

45

12

18.5

M 12

-

-

-

310-311

✓

■

■

HSM

50 06 16 SG

diam. 6

50

12

23.5

M 16

-

-

-

310-311

✓

■

■

HSM

FOR SHRINKING PROCESSES

for diam. 8

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request



1/5 ▶

Arbor and Adapter Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

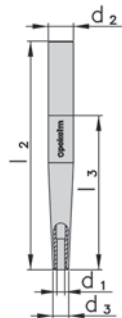
Form/DIN

l_2

l_1

ref. pg. arbors
ref. accessories
features

Plain shank



110 08 604 S

diam.
8

110

13

20

diam.
20

-

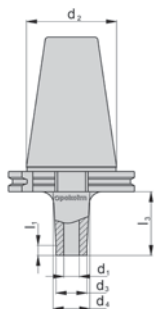
160

-

379-381



Int. taper 40 DIN 69 871 AD



50 08 750 S

diam.
8

50

16

20.4

SK 40

DIN 69871
AD

-

7.8

A, B



G 6.3
18.000

75 08 750 S

diam.
8

75

16

23

SK 40

DIN 69871
AD

-

7.8

A, B



G 6.3
18.000

100 08 750 S

diam.
8

100

16

25.7

SK 40

DIN 69871
AD

-

7.8

A, B

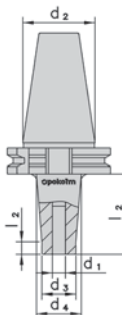


G 6.3
18.000

KBSK40-69872A
A > Page 406

KBSK40-69872B
B > Page 406

Int. taper 40 DIN 69 871 AD | re-inforced version



50 08 750 SB

diam.
8

50

21

27.6

SK 40

DIN 69871
AD

-

7.8

A, B



G 6.3
18.000

100 08 750 SB

diam.
8

100

21

35.5

SK 40

DIN 69871
AD

-

7.8

A, B



G 6.3
18.000

KBSK40-69872A
A > Page 406

KBSK40-69872B
B > Page 406



FOR SHRINKING PROCESSES

for diam. 8

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

2/5

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

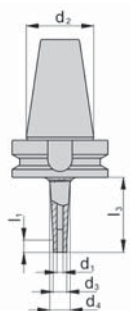
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 MAS BT



50 08 754 S

diam.
8

50

16

21

BT 40

JIS B 6339
AD

-

7.8

7 HSM G 6.3
18.000

100 08 754 S

diam.
8

100

16

25.7

BT 40

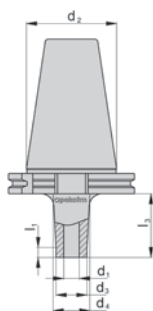
JIS B 6339
AD

-

7.8

7 HSM G 6.3
18.000

Int. taper 50 DIN 69 871 AD



50 08 710 S

diam.
8

50

16

21

SK 50

DIN 69871
AD

-

7.8

A, B

7 HSM G 16
8.000

100 08 710 S

diam.
8

100

16

26

SK 50

DIN 69871
AD

-

7.8

A, B

7 HSM G 16
8.000

150 08 710 S

diam.
8

150

16

30.9

SK 50

DIN 69871
AD

-

7.8

A, B

7 HSM G 16
8.000

200 08 710 S

diam.
8

200

16

36

SK 50

DIN 69871
AD

-

7.8

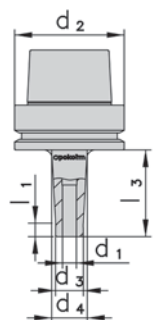
A, B

7 HSM G 16
8.000


KBSK50-69872A
A > Page 406


KBSK50-69872B
B > Page 406

Hollow taper shank 32 E



40 08 E32 S

diam.
8

40

16

20

HSK
32

form E

-

7.8

A, B

7 HSM G 2.5
38.000


KMR-32
A > Page 406


SCHLUESSELHSK32
B > Page 406

Arbor and Adapter
Systems

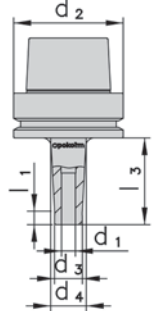
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

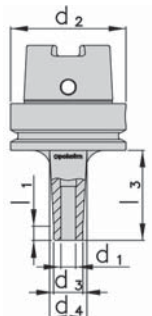
 l_2 l_1 ref. pg. arbors
ref. accessories
features

Hollow taper shank 40 E



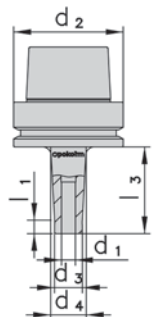
40 08 E40 S	diam. 8	40	16	19	HSK 40	form E	-	7.8	A, B	✓ HSM G 2.5 (30.000)
70 08 E40 S	diam. 8	70	16	23	HSK 40	form E	-	7.8	A, B	✓ HSM G 2.5 (30.000)
KMR-40A A > Page 406	SCHLUESSELHSK40 B > Page 406									

Hollow taper shank 40 EC



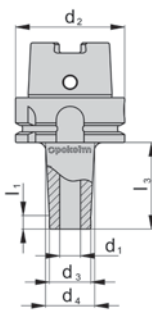
40 08 EC 40 S	diam. 8	40	16	19.4	HSK 40	form C+E	-	7.8		✓ HSM G 2.5 (30.000)
70 08 EC 40 S	diam. 8	70	16	22.5	HSK 40	form C+E	-	7.8		✓ HSM G 2.5 (30.000)
100 08 EC 40 S	diam. 8	100	16	26	HSK 40	form C+E	-	7.8		✓ HSM G 2.5 (30.000)

Hollow taper shank 50 E



50 08 E50 S	diam. 8	50	16	20.3	HSK 50	form E	-	7.8	A, B	✓ HSM G 2.5 (30.000)
100 08 E50 S	diam. 8	100	16	25.7	HSK 50	form E	-	7.8	A, B	✓ HSM G 2.5 (30.000)
150 08 E50 S	diam. 8	150	16	30.9	HSK 50	form E	-	7.8	A, B	⚠ HSM G 2.5 (30.000)
KMR-50A A > Page 406	SCHLUESSELHSK50 B > Page 406									

Hollow taper shank 63 A



50 08 A63 S	diam. 8	50	16	20.4	HSK 63	form A	-	7.8	A, B	✓ HSM G 6.3 (30.000)
75 08 A63 S	diam. 8	75	16	23	HSK 63	form A	-	7.8	A, B	✓ HSM G 6.3 (30.000)
100 08 A63 S	diam. 8	100	16	25.7	HSK 63	form A	-	7.8	A, B	✓ HSM G 6.3 (30.000)
KMR-63A A > Page 406	SCHLUESSELHSK63 B > Page 406									

Arbor and Adapter
Systems

catalogue no.

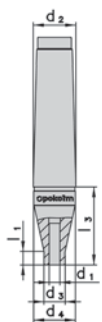
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

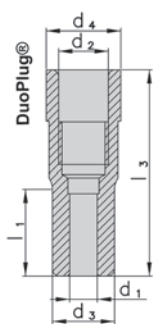
ref. pg. arbors
ref. accessories
features

Morse taper shank adapters



50 08 MK2 S	diam. 8	50	16	18	MTS 2	-	-	7.8	336-339	
50 08 MK3 S	diam. 8	50	16	24	MTS 3	-	-	7.8	336-339	
100 08 MK2 S	diam. 8	100	16	18	MTS 2	-	-	7.8	336-339	
100 08 MK3 S	diam. 8	100	16	23.6	MTS 3	-	-	7.8	336-339	
150 08 MK3 S	diam. 8	150	16	24	MTS 3	-	-	7.8	336-339	
200 08 MK5 S	diam. 8	200	16	44.5	MTS 5	-	-	7.8	336-339	

DuoPlug®



45 08 12 SG	diam. 8	45	16	18.5	M 12	-	-	-	310-311	
50 08 16 SG	diam. 8	50	16	23.5	M 16	-	-	-	310-311	



FOR SHRINKING PROCESSES

for diam. 10

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

1/5

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

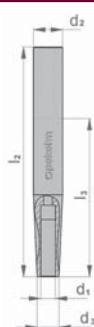
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Plain shank



104 10 604 S

diam.
10

104

15

25

diam.
25

-

160

-

382-383

⚠

10

10

10

10

10

10

110 10 604 S

diam.
10

110

15

20

diam.
20

-

160

-

379-381

✓

10

10

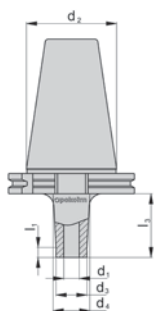
10

10

10

10

Int. taper 40 DIN 69 871 AD



50 10 750 S

diam.
10

50

20

24.4

SK 40

DIN 69871
AD

-

7.8

A, B

✓

10

10

10

10

10

10

75 10 750 S

diam.
10

75

20

27

SK 40

DIN 69871
AD

-

7.8

A, B

✓

10

10

10

10

10

10

100 10 750 S

diam.
10

100

20

29.7

SK 40

DIN 69871
AD

-

7.8

A, B

✓

10

10

10

10

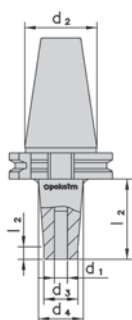
10

10

KBSK40-69872A
A > Page 406

KBSK40-69872B
B > Page 406

Int. taper 40 DIN 69 871 AD | re-inforced version



50 10 750 SB

diam.
10

50

24

30.6

SK 40

DIN 69871
AD

-

7.8

A, B

✓

10

10

10

10

10

10

100 10 750 SB

diam.
10

100

24

38.5

SK 40

DIN 69871
AD

-

7.8

A, B

✓

10

10

10

10

10

10

KBSK40-69872A
A > Page 406

KBSK40-69872B
B > Page 406

Arbor and Adapter
Systems

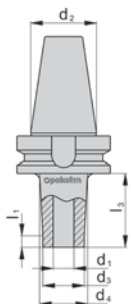
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Int. taper 40 MAS BT



50 10 754 S

diam.
10

50

20

24.4

BT 40

JIS B 6339
AD

-

7.8



100 10 754 S

diam.
10

100

20

29.7

BT 40

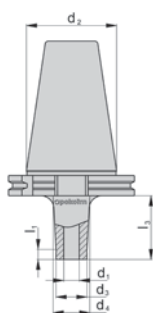
JIS B 6339
AD

-

7.8



Int. taper 50 DIN 69 871 AD



50 10 710 S

diam.
10

50

20

25

SK 50

DIN 69871
AD

-

7.8

A, B



100 10 710 S

diam.
10

100

20

30

SK 50

DIN 69871
AD

-

7.8

A, B



150 10 710 S

diam.
10

150

20

35

SK 50

DIN 69871
AD

-

7.8

A, B



200 10 710 S

diam.
10

200

20

40

SK 50

DIN 69871
AD

-

7.8

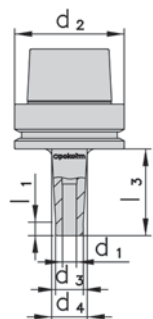
A, B



KBSK50-69872A
A > Page 406

KBSK50-69872B
B > Page 406

Hollow taper shank 32 E



40 10 E32 S

diam.
10

40

20

24

HSK
32

form E

-

7.8

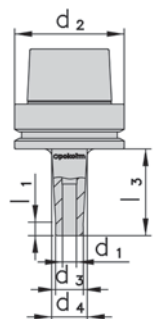
A, B



KMR-32
A > Page 406

SCHLUESSELHSK32
B > Page 406

Hollow taper shank 40 E



40 10 E40 S

diam.
10

40

20

23.4

HSK
40

form E

-

7.8

A, B



70 10 E40 S

diam.
10

70

20

26.5

HSK
40

form E

-

7.8

A, B



100 10 E40 S

diam.
10

100

20

30

HSK
40

form E

-

7.8

A, B



KMR-40A
A > Page 406

SCHLUESSELHSK40
B > Page 406



FOR SHRINKING PROCESSES

for diam. 10

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

3/5

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

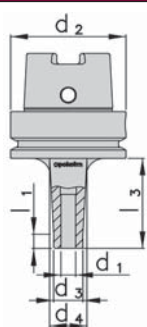
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Hollow taper shank 40 EC



40 10 EC 40 S

diam.
10

40

20

24

HSK
40

form C+E

-

7.8

7 HSM G 2.5
20.000

70 10 EC 40 S

diam.
10

70

20

26.5

HSK
40

form C+E

-

7.8

7 HSM G 2.5
20.000

100 10 EC 40 S

diam.
10

100

20

29.6

HSK
40

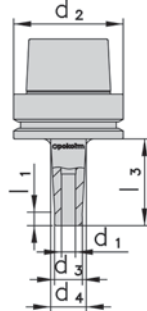
form C+E

-

7.8

7 HSM G 2.5
20.000

Hollow taper shank 50 E



50 10 E50 S

diam.
10

50

20

24.4

HSK
50

form E

-

7.8

A, B

7 HSM G 2.5
20.000

100 10 E50 S

diam.
10

100

20

30

HSK
50

form E

-

7.8

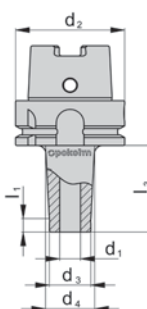
A, B

7 HSM G 2.5
20.000

KMR-50A
A > Page 406

SCHLUESSELHSK50
B > Page 406

Hollow taper shank 63 A



50 10 A63 S

diam.
10

50

20

24.4

HSK
63

form A

-

7.8

A, B

7 HSM G 6.3
20.000

75 10 A63 S

diam.
10

75

20

27

HSK
63

form A

-

7.8

A, B

7 HSM G 6.3
20.000

100 10 A63 S

diam.
10

100

20

30

HSK
63

form A

-

7.8

A, B

7 HSM G 6.3
20.000

150 10 A63 S

diam.
10

150

20

35

HSK
63

form A

-

7.8

A, B

7 HSM G 6.3
20.000

200 10 A63 S

diam.
10

200

20

40.1

HSK
63

form A

-

7.8

A, B

7 HSM G 6.3
20.000

KMR-63A
A > Page 406

SCHLUESSELHSK63
B > Page 406

Arbor and Adapter
Systems

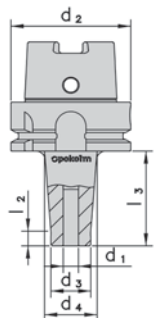
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A | re-inforced version



50 10 A63 SB

diam.
10

50

24

30.6

HSK
63

form A

-

7.8

A, B

✓

HSM

G 6.3

20.000

100 10 A63 SB

diam.
10

100

24

38.5

HSK
63

form A

-

7.8

A, B

✓

HSM

G 6.3

20.000

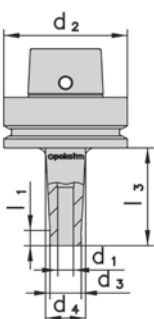
KMR-63A

A > Page 406

SCHLUESSELHSK63

B > Page 406

Hollow taper shank 63 F



50 10 F63 S

diam.
10

50

20

25

HSK
63

form F

-

7.8

⚠

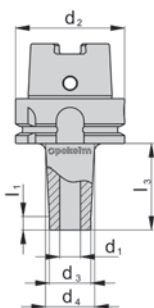
HSM

G 2.5

20.000

Hollow taper shank 100 A

NEW



100 10 A100 S

diam.
10

100

20

29.7

HSK
100

form A

-

7.8

A, B

✓

NEW

HSM

G 10

0.000

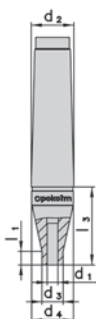
KMR-100A

A > Page 406

SCHLUESSELHSK100

B > Page 406

Morse taper shank adapters



50 10 MK3 S

diam.
10

50

20

24

MTS
3

-

-

7.8

336-339

⚠

HSM

100 10 MK2 S

diam.
10

100

20.5

20.5

MTS
2

-

-

7.8

336-339

⚠

HSM

100 10 MK3 S

diam.
10

100

20

24

MTS
3

-

-

7.8

336-339

⚠

HSM

150 10 MK4 S

diam.
10

150

20

32

MTS
4

-

-

7.8

336-339

⚠

HSM

200 10 MK5 S

diam.
10

200

20

44.2

MTS
5

-

-

7.8

336-339

⚠

HSM



FOR SHRINKING PROCESSES

for diam. 10

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

◀ 5/5

Arbor and Adapter
Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

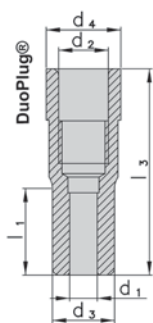
Form/DIN

l_2

l_1

ref. pg. arbors
ref. accessories
features

DuoPlug®



50 10 16 SG

diam.
10

50

20

23.5

M 16

-

-

-

310-311



FOR SHRINKING PROCESSES

for diam. 12

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request



1/4 ▶

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

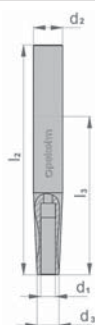
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Plain shank



104 12 604 S

diam.
12

104

17

25

diam.
25

-

160

-

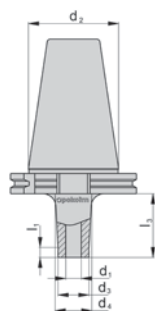
382-383

✓

■

■

Int. taper 40 DIN 69 871 AD



50 12 750 S

diam.
12

50

24

28.4

SK 40

DIN 69871
AD

-

7.8

A, B

✓

■

HSM

G 6.3

18.000

75 12 750 S

diam.
12

75

24

31

SK 40

DIN 69871
AD

-

7.8

A, B

✓

■

HSM

G 6.3

18.000

100 12 750 S

diam.
12

100

24

33.6

SK 40

DIN 69871
AD

-

7.8

A, B

✓

■

HSM

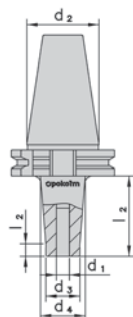
G 6.3

18.000

KBSK40-69872A
A > Page 406

KBSK40-69872B
B > Page 406

Int. taper 40 DIN 69 871 AD | re-inforced version



50 12 750 SB

diam.
12

50

24

30.6

SK 40

DIN 69871
AD

-

7.8

A, B

✓

■

HSM

G 6.3

18.000

100 12 750 SB

diam.
12

100

24

38.5

SK 40

DIN 69871
AD

-

7.8

A, B

7

■

HSM

G 6.3

18.000

KBSK40-69872A
A > Page 406

KBSK40-69872B
B > Page 406



FOR SHRINKING PROCESSES

for diam. 12

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

2/4

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

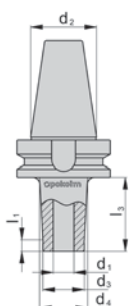
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 MAS BT



50 12 754 S

diam.
12

50

24

29

BT 40

JIS B 6339
AD

-

7.8

7 HSM G 6.3
18.000

100 12 754 S

diam.
12

100

24

33.7

BT 40

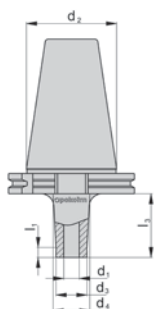
JIS B 6339
AD

-

7.8

7 HSM G 6.3
18.000

Int. taper 50 DIN 69 871 AD



50 12 710 S

diam.
12

50

24

28.4

SK 50

DIN 69871
AD

-

7.8

✓ HSM G 16
8.000

100 12 710 S

diam.
12

100

24

33.7

SK 50

DIN 69871
AD

-

7.8

✓ HSM G 16
8.000

150 12 710 S

diam.
12

150

24

39

SK 50

DIN 69871
AD

-

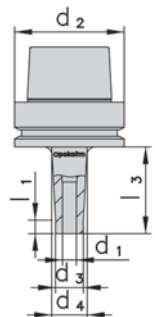
7.8

7 HSM G 16
8.000

KBSK50-69872A
A > Page 406

KBSK50-69872B
B > Page 406

Hollow taper shank 40 E



40 12 E40 S

diam.
12

40

24

27.4

HSK
40

form E

-

7.8

✓ HSM G 2.5
30.000

70 12 E40 S

diam.
12

70

24

30.5

HSK
40

form E

-

7.8

✓ HSM G 2.5
30.000

100 12 E40 S

diam.
12

100

24

32

HSK
40

form E

-

7.8

7 HSM G 2.5
30.000

KMR-40A
A > Page 406

SCHLUESSELHSK40
B > Page 406

Arbor and Adapter
Systems

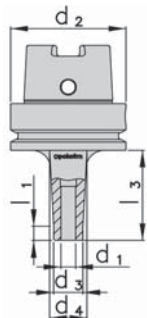
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Hollow taper shank 40 EC



40 12 EC 40 S

diam.
12

40

24

28

HSK
40

form C+E

-

7.8

70 12 EC 40 S

diam.
12

70

24

30.5

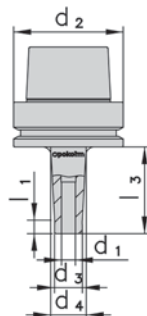
HSK
40

form C+E

-

7.8

Hollow taper shank 50 E



50 12 E50 S

diam.
12

50

24

28.4

HSK
50

form E

-

7.8

A, B

100 12 E50 S

diam.
12

100

24

34

HSK
50

form E

-

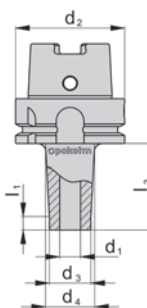
7.8

A, B

KMR-50A
A > Page 406

SCHLUESSELHSK50
B > Page 406

Hollow taper shank 63 A



50 12 A63 S

diam.
12

50

24

28.4

HSK
63

form A

-

7.8

A, B

75 12 A63 S

diam.
12

75

24

31

HSK
63

form A

-

7.8

A, B

100 12 A63 S

diam.
12

100

24

33.7

HSK
63

form A

-

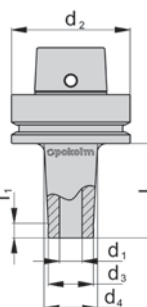
7.8

A, B

KMR-63A
A > Page 406

SCHLUESSELHSK63
B > Page 406

Hollow taper shank 63 F



50 12 F63 S

diam.
12

50

24

29

HSK
63

form F

-

7.8



FOR SHRINKING PROCESSES

for diam. 12

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

◀ 4/4

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

Form/DIN

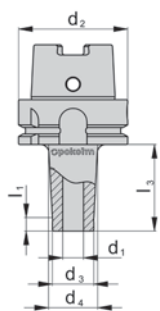
l₂

l₁

ref. pg. arbors
ref. accessories
features

Hollow taper shank 100 A

NEW



100 12 A100 S

diam.
12

100

24

33.7

HSK
100

form A

-

7.8

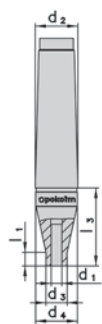
A, B

✓ NEW HSM G16 6,000

KMR-100A
A > Page 406

SCHLUESSELHSK100
B > Page 406

Morse taper shank adapters



50 12 MK3 S

diam.
12

50

24

24.5

MTS
3

-

-

7.8

336-339

⚠ HSM

100 12 MK3 S

diam.
12

100

24

24

MTS
3

-

-

-

336-339

⚠ HSM

150 12 MK4 S

diam.
12

150

24

31

MTS
4

-

-

7.8

336-339

⚠ HSM

200 12 MK5 S

diam.
12

200

24

44.5

MTS
5

-

-

7.8

336-339

⚠ HSM

FOR SHRINKING PROCESSES

for diam. 16

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

Please note: Zero-reach arbors cannot be ordered separately. We only supply in a shrink-grip connection with a solid carbide or dense antivibration adapter.
(Please indicate desired adapter on purchase-order form.)



1 / 4 ▶

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD | with zero reach

	00 16 750 S	diam. 16	0	-	-	SK 40	DIN 69871 AD	-	-	A, B	
	 KBSK40-69872A A > Page 406	 KBSK40-69872B B > Page 406									

Int. taper 40 DIN 69 871 AD

	50 16 750 S	diam. 16	50	32	36.4	SK 40	DIN 69871 AD	-	7.8	A, B	
	75 16 750 S	diam. 16	75	32	39	SK 40	DIN 69871 AD	-	7.8	A, B	
	100 16 750 S	diam. 16	100	32	41.7	SK 40	DIN 69871 AD	-	7.8	A, B	
	 KBSK40-69872A A > Page 406	 KBSK40-69872B B > Page 406									

Int. taper 40 MAS BT

	50 16 754 S	diam. 16	50	32	36.4	BT 40	JIS B 6339 AD	-	7.8		
	100 16 754 S	diam. 16	100	32	41.7	BT 40	JIS B 6339 AD	-	7.8		



FOR SHRINKING PROCESSES

for diam. 16

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

Please note: Zero-reach arbors cannot be ordered separately. We only supply in a shrink-grip connection with a solid carbide or dense antivibration adapter.
(Please indicate desired adapter on purchase-order form.)

2/4

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

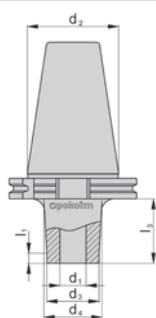
Form/DIN

l₂

l₁

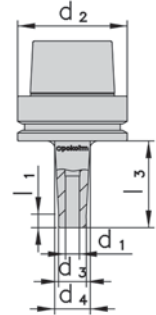
ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 AD



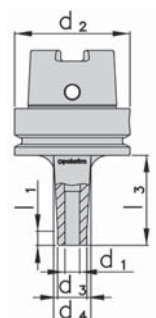
50 16 710 S	diam. 16	50	32	36.4	SK 50	DIN 69871 AD	-	7.8	A, B	☒ ☒ ☒ HSM G10 8.000
100 16 710 S	diam. 16	100	32	41.7	SK 50	DIN 69871 AD	-	7.8	A, B	☒ ☒ ☒ HSM G10 8.000
150 16 710 S	diam. 16	150	32	46.9	SK 50	DIN 69871 AD	-	7.8	A, B	☒ ☒ ☒ HSM G10 8.000
200 16 710 S	diam. 16	200	32	52	SK 50	DIN 69871 AD	-	7.8	A, B	☐ ☒ ☒ HSM G10 8.000
 KBSK50-69872A A > Page 406		 KBSK50-69872B B > Page 406								

Hollow taper shank 40 E



40 16 E40 S	diam. 16	40	32	32	HSK 40	form E	-	-	A, B	☒ ☒ ☒ HSM G2.5 30.000
 KMR-40A A > Page 406		 SCHLUESSELHSK40 B > Page 406								

Hollow taper shank 40 EC



40 16 EC 40 S	diam. 16	40	32	32	HSK 40	form C+E	-	-		☐ ☒ ☒ HSM G2.5 30.000

Arbor and Adapter
Systems

catalogue no.

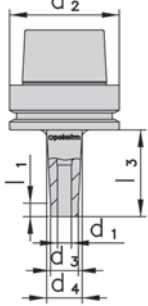
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

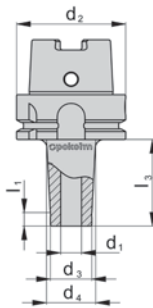
ref. pg. arbors
ref. accessories
features

Hollow taper shank 50 E



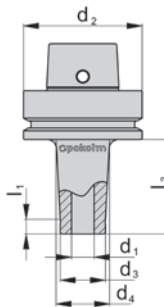
50 16 E50 S	diam. 16	50	32	36.4	HSK 50	form E	-	7.8	A, B	
100 16 E50 S	diam. 16	100	32	40	HSK 50	form E	-	7.8	A, B	
KMR-50A A > Page 406	SCHLUESSELHSK50 B > Page 406									

Hollow taper shank 63 A



50 16 A63 S	diam. 16	50	32	36.4	HSK 63	form A	-	7.8	A, B	
75 16 A63 S	diam. 16	75	32	39	HSK 63	form A	-	7.8	A, B	
100 16 A63 S	diam. 16	100	32	41.7	HSK 63	form A	-	7.8	A, B	
150 16 A63 S	diam. 16	150	32	46.9	HSK 63	form A	-	7.8	A, B	
KMR-63A A > Page 406	SCHLUESSELHSK63 B > Page 406									

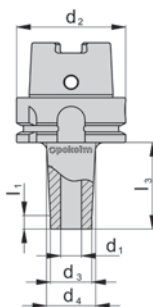
Hollow taper shank 63 F



50 16 F63 S	diam. 16	50	32	36.4	HSK 63	form F	-	7.8		
100 16 F63 S	diam. 16	100	32	42	HSK 63	form F	-	7.8		

Hollow taper shank 100 A

NEW



60 16 A100 S	diam. 16	60	32	37.5	HSK 100	form A	-	7.8	A, B	
KMR-100A A > Page 406	SCHLUESSELHSK100 B > Page 406									

for diam. 16

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

Please note: Zero-reach arbors cannot be ordered separately. We only supply in a shrink-grip connection with a solid carbide or dense antivibration adapter. (Please indicate desired adapter on purchase-order form.)

◀ 4 / 4

catalogue no.

 d_1 I_3 d_3 d_1 ~~d₂~~

Form/DIN

 I_2
$$I_1$$

ref. pg. arbors
ref. accessories
features

150 16 MK4 S	diam. 16	150	32	32	MTS 4	-	-	7.8	336-339	  HSM
200 16 MK5 S	diam. 16	200	32	44.2	MTS 5	-	-	7.8	336-339	  HSM

FOR SHRINKING PROCESSES

for diam. 20

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

Please note: Zero-reach arbors cannot be ordered separately. We only supply in a shrink-grip connection with a solid carbide or dense antivibration adapter.
(Please indicate desired adapter on purchase-order form.)



1/3 ▶

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD | with zero reach

	00 20 750 S	diam. 20	0	-	-	SK 40	DIN 69871 AD	-	-	A, B	
	KBSK40-69872A A > Page 406	KBSK40-69872B B > Page 406									

Int. taper 40 DIN 69 871 AD

	50 20 750 S	diam. 20	50	40	44.4	SK 40	DIN 69871 AD	-	7.8	A, B	
	75 20 750 S	diam. 20	75	40	47	SK 40	DIN 69871 AD	-	7.8	A, B	
	100 20 750 S	diam. 20	100	40	49	SK 40	DIN 69871 AD	-	7.8	A, B	
	KBSK40-69872A A > Page 406	KBSK40-69872B B > Page 406									

Int. taper 40 MAS BT | with zero reach

	00 20 754 S	diam. 20	0	-	-	BT 40	JIS B 6339 AD	-	-		



FOR SHRINKING PROCESSES

for diam. 20

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

Please note: Zero-reach arbors cannot be ordered separately. We only supply in a shrink-grip connection with a solid carbide or dense antivibration adapter.
(Please indicate desired adapter on purchase-order form.)

2/3

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 MAS BT

NEW

	50 20 754 S	diam. 20	50	40	44.4	BT 40	JIS B 6339 AD	-	7.8		7 NEW HSM G 6.3 18,000

Int. taper 50 DIN 69 871 AD | with zero reach

	00 20 710 S	diam. 20	0	-	-	SK 50	DIN 69871 AD	-	-	A, B	✓ HSM G 10 8,000
	 KBSK50-69872A A > Page 406	 KBSK50-69872B B > Page 406									

Int. taper 50 DIN 69 871 AD

	50 20 710 S	diam. 20	50	40	44.4	SK 50	DIN 69871 AD	-	7.8	A, B	✓ HSM G 10 8,000
	100 20 710 S	diam. 20	100	40	50	SK 50	DIN 69871 AD	-	7.8	A, B	✓ HSM G 10 8,000
	 KBSK50-69872A A > Page 406	 KBSK50-69872B B > Page 406									

Arbor and Adapter
Systems

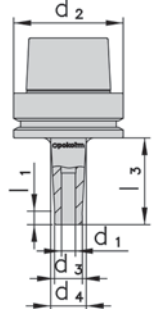
catalogue no.

 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Hollow taper shank 50 E



60 20 E50 S

diam.
20

60

40

40

HSK
50

form E

-

-

A, B

100 20 E50 S

diam.
20

100

40

40

HSK
50

form E

-

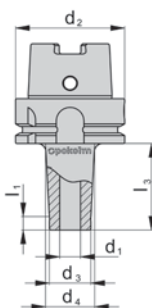
-

A, B

KMR-50A
A > Page 406

SCHLUESSELHSK50
B > Page 406

Hollow taper shank 63 A



60 20 A63 S

diam.
20

60

40

45.5

HSK
63

form A

-

7.8

A, B

100 20 A63 S

diam.
20

100

40

49.7

HSK
63

form A

-

7.8

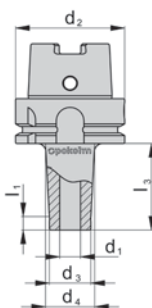
A, B

KMR-63A
A > Page 406

SCHLUESSELHSK63
B > Page 406

Hollow taper shank 100 A

NEW



60 20 A100 S

diam.
20

60

40

45.5

HSK
100

form A

-

7.8

A, B

KMR-100A
A > Page 406

SCHLUESSELHSK100
B > Page 406



FOR SHRINKING PROCESSES

for diam. 25

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

Please note: Zero-reach arbors cannot be ordered separately. We only supply in a shrink-grip connection with a solid carbide or dense antivibration adapter.
(Please indicate desired adapter on purchase-order form.)

1/2 ▶

Arbor and Adapter Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

Form/DIN

l_2

l_1

ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD | with zero reach

	00 25 750 S	diam. 25	10	44	44	SK 40	DIN 69871 AD	-	-	A, B	
	KBSK40-69872A A > Page 406					KBSK40-69872B B > Page 406					

Int. taper 40 DIN 69 871 AD

	60 25 750 S	diam. 25	60	46	46	SK 40	DIN 69871 AD	-	-	A, B	
	KBSK40-69872A A > Page 406					KBSK40-69872B B > Page 406					

Int. taper 50 DIN 69 871 AD | with zero reach

	00 25 710 S	diam. 25	0	-	-	SK 50	DIN 69871 AD	-	-	A, B	
	KBSK50-69872A A > Page 406					KBSK50-69872B B > Page 406					

Arbor and Adapter
Systems

catalogue no.

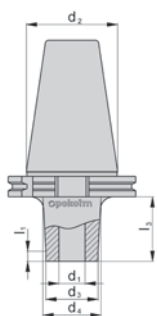
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 AD



60 25 710 S

diam.
25

60

46

46

SK 50

DIN 69871
AD

-

-

A, B

✓

HSM

G16

(8.000)

100 25 710 S

diam.
25

100

46

56

SK 50

DIN 69871
AD

-

7.8

A, B

✓

HSM

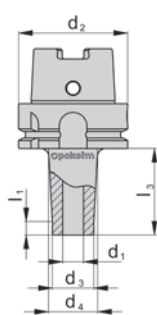
G16

(8.000)

KBSK50-69872A
A > Page 406

KBSK50-69872B
B > Page 406

Hollow taper shank 63 A



60 25 A63 S

diam.
25

60

46

46

HSK
63

form A

-

-

A, B

✓

HSM

G6.3

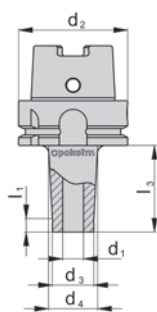
(20.000)

KMR-63A
A > Page 406

SCHLUESSELHSK63
B > Page 406

Hollow taper shank 100 A

NEW



60 25 A100 S

diam.
25

60

46

46

HSK
100

form A

-

7.8

A, B

✓

NEW

HSM

G16

(8.000)



FOR SHRINKING PROCESSES

for diam. 36

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features
- SK and BT arbors with coolant supply through collar on request
- other dimensions on request

Please note: Zero-reach arbors cannot be ordered separately. We only supply in a shrink-grip connection with a solid carbide or dense antivibration adapter.
(Please indicate desired adapter on purchase-order form.)

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 50 DIN 69 871 AD | with zero reach

	00 36 710 S	diam. 36	10	50	50	SK 50	DIN 69871 AD	-	-	A, B	
	 KBSK50-69872A A > Page 406	 KBSK50-69872B B > Page 406									

Int. taper 50 DIN 69 871 AD

	60 36 710 S	diam. 36	60	72	72	SK 50	DIN 69871 AD	-	-	A, B	
	 KBSK50-69872A A > Page 406	 KBSK50-69872B B > Page 406									

PRECISION ER-COLLETS

for diam. 1 - 12

Precision Collets according to DIN 6499-B

- biconical collets
- collets slotted at both ends
- concentricity 6 µm
- repeatable accuracy 6 µm



Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

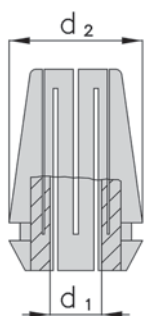
Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

ER 20



ER20 0,5-1

diam.
1

-

0.5

-

ER 20

-

-

-

386-387
A, B

✓

ER20 1-2

diam.
2

-

1

-

ER 20

-

-

-

386-387
A, B

✓

ER20 2-3

diam.
3

-

2

-

ER 20

-

-

-

386-387
A, B

✓

ER20 3-4

diam.
4

-

3

-

ER 20

-

-

-

386-387
A, B

✓

ER20 4-5

diam.
5

-

4

-

ER 20

-

-

-

386-387
A, B

✓

ER20 5-6

diam.
6

-

5

-

ER 20

-

-

-

386-387
A, B

✓

ER20 7-8

diam.
8

-

7

-

ER 20

-

-

-

386-387
A, B

✓

ER20 9-10

diam.
10

-

9

-

ER 20

-

-

-

386-387
A, B

✓

ER20 11-12

diam.
12

-

11

-

ER 20

-

-

-

386-387
A, B

✓



20 501
A > Page 404



ER20 001
B > Page 405



HSM PRECISION COLLET CHUCKS

for ER 20 collets

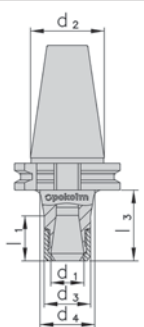
- SK, BT and HSK arbors are already pre-balanced; for balancing grade, see features
- special HSM design
- extent of delivery includes precision collet chuck tightening nut
- Other dimensions on request.

1/2

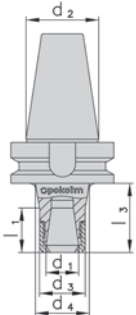
Arbor and Adapter
Systems

catalogue no.
 d_1
 l_3
 d_3
 d_4
 d_2
Form/DIN
 l_2
 l_1
*ref. pg. arbors
ref. accessories
features*

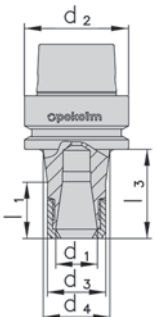
Int. taper 40 DIN 69 871 AD

	50 ER20 750	ER 20	50	28	33	SK 40	DIN 69871 AD	-	33.8	A, B, C, D	  
	100 ER20 750	ER 20	100	28	40	SK 40	DIN 69871 AD	-	33.8	A, B, C, D	  
 20 501 A > Page 404	 ER20 001 B > Page 405		 KBSK40-69872A C > Page 406		 KBSK40-69872B D > Page 406						

Int. taper 40 MAS BT

	50 ER20 754	ER 20	50	28	32	BT 40	JIS B 6339 AD	-	33.8	A, B	  
	100 ER20 754	ER 20	100	28	40	BT 40	JIS B 6339 AD	-	33.8	A, B	  
 20 501 A > Page 404	 ER20 001 B > Page 405										

Hollow taper shank 40 E

	50 ER20 E40	ER 20	50	28	32	HSK 40	form E	-	33.8	A, B, C, D	  
 20 501 A > Page 404	 ER20 001 B > Page 405		 KMR-40A C > Page 406		 SCHLUESSELHSK40 D > Page 406						

Arbor and Adapter
Systems

catalogue no.

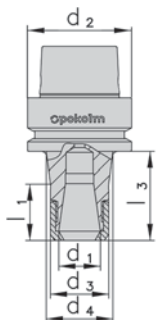
 d_1
 l_3
 d_3
 d_4
 d_2

Form/DIN

 l_2
 l_1

ref. pg. arbors
ref. accessories
features

Hollow taper shank 50 E



50 ER20 E50

ER 20

50

28

32

HSK
50

form E

-

33.8

A, B, C, D

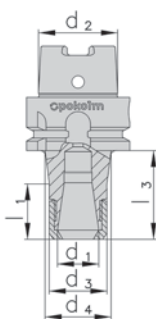

20 501
A > Page 404

ER20 001
B > Page 405

KMR-50A
C > Page 406

SCHLUESSELHSK50
D > Page 406

Hollow taper shank 63 A



50 ER20 A63

ER 20

50

28

32

HSK
63

form A

-

33.8

A, B, C, D



100 ER20 A63

ER 20

100

28

40

HSK
63

form A

-

33.8

A, B, C, D


20 501
A > Page 404

ER20 001
B > Page 405

KMR-63A
C > Page 406

SCHLUESSELHSK63
D > Page 406



DRILL CHUCKS

diam. 0,3 - 8 mm

CNC precision Drill chucks

- suitable up to 7000 rev/min
- with internal coolant supply
- independent of rotating direction
- compact design
- delivery extent includes small and large seal ring

1/2 ▶

Arbor and Adapter Systems

catalogue no.	d ₁	l ₃	d ₃	d ₄	d ₂	Form/DIN	l ₂	l ₁	ref. pg. arbors	ref. accessories	features
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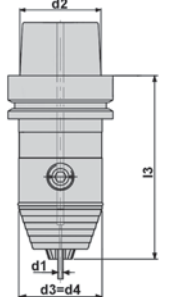
Int. taper 40 DIN 69 871 AD/B

NEW

	BF 0,3-8 750 IC	diam. 8	57	-	36	SK 40	DIN 69871 AD	-	-	A, B, C, D, E, F	
	 INBUS 4T A > Page 404	 KBSK40-69872A B > Page 406		 KBSK40-69872B C > Page 406		 BF 08DS04 D > Page 407		 BF 08DS08 E > Page 407			
	 BF08MW F > Page 407										

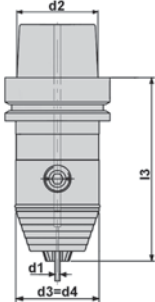
Hollow taper shank 40 E

NEW

	BF 0,3-8 E40 IC	diam. 8	74	-	36	HSK 40	form E	-	-	A, B, C, D, E, F	  
	 INBUS 4T A > Page 404	 KMR-40A B > Page 406		 SCHLUESSELHSK40 C > Page 406		 BF 08DS04 D > Page 407		 BF 08DS08 E > Page 407			
	 BF08MW F > Page 407										

Hollow taper shank 50 E

NEW

	BF 0,3-8 E50 IC	diam. 8	72	-	36	HSK 50	form E	-	-	A, B, C, D, E, F	  
	 INBUS 4T A > Page 404	 KMR-50A B > Page 406		 SCHLUESSELHSK50 C > Page 406		 BF 08DS04 D > Page 407		 BF 08DS08 E > Page 407			
 BF08MW F > Page 407											

Arbor and Adapter
Systems

catalogue no.

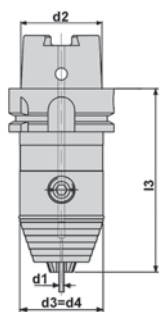
 d_1 l_3 d_3 d_4 d_2

Form/DIN

 l_2 l_1 ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A

NEW



BF 0,3-8 A63 IC

diam.
8

73

-

36

HSK
63

form A

-

-

A, B, C, D, E, F



INBUS 4T
A > Page 404

KMR-63A
B > Page 406

SCHLUESSELHSK63
C > Page 406

BF 08DS04
D > Page 407

BF 08DS08
E > Page 407

BF08MW
F > Page 407

With threaded shank M 16

NEW



BF 0,3-8 M16 IC

diam.
8

75

36

36

M 16

-

-

-

330-335
A, B, C, D

INBUS 4T
A > Page 404

BF 08DS04
B > Page 407

BF 08DS08
C > Page 407

BF08MW
D > Page 407



DRILL CHUCKS

diam. 0,5 - 13 mm

CNC precision Drill chucks

- suitable up to 7000 rev/min
- with internal coolant supply
- independent of rotating direction
- compact design
- delivery extent includes small and large seal ring

1/2 ▶

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD/B

NEW

	BF 0,5-13 750 IC	diam. 13	97	-	50	SK 40	DIN 69871 AD	-	-	A, B, C, D, E, F	✓ NEW
	INBUS 6T A > Page 404	KBSK40-69872A B > Page 406		KBSK40-69872B C > Page 406		BF 08DS06 D > Page 407		BF 13DS13 E > Page 407			
	BF13MW F > Page 407										

Int. taper 50 DIN 69 871 AD/B

NEW

	BF 0,5-13 710 IC	diam. 13	93	-	50	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	✓ NEW
	INBUS 6T A > Page 404	KBSK50-69872A B > Page 406		KBSK50-69872B C > Page 406		BF 08DS06 D > Page 407		BF 13DS13 E > Page 407			
	BF13MW F > Page 407										

Hollow taper shank 50 E

NEW

	BF 0,5-13 E50 IC	diam. 13	96	-	50	HSK 50	form E	-	-	A, B, C, D, E, F	✓ NEW
	INBUS 6T A > Page 404	KMR-50A B > Page 406		SCHLUESSELHSK50 C > Page 406		BF 08DS06 D > Page 407		BF 13DS13 E > Page 407			
	BF13MW F > Page 407										

Arbor and Adapter
Systems

catalogue no.

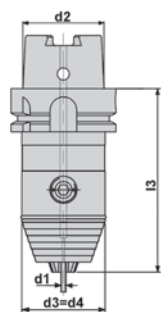
d₁l₃d₃d₄d₂

Form/DIN

l₂l₁ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A

NEW



BF 0,5-13 A63 IC

diam.
13

84

-

50

HSK
63

form A

-

-

A, B, C, D, E, F



INBUS 6T
A > Page 404

KMR-63A
B > Page 406

SCHLUESSELHSK63
C > Page 406

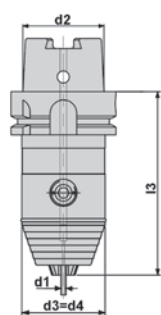
BF 08DS06
D > Page 407

BF 13DS13
E > Page 407

BF13MW
F > Page 407

Hollow taper shank 100 A

NEW



BF 0,5-13 A100 IC

diam.
13

89

-

50

HSK
100

form A

-

-

A, B, C, D, E, F



INBUS 6T
A > Page 404

KMR-100A
B > Page 406

SCHLUESSELHSK100
C > Page 406

BF 08DS06
D > Page 407

BF 13DS13
E > Page 407

BF13MW
F > Page 407

With threaded shank M 16

NEW



BF 0,5-13 M16 IC

diam.
13

100

50

50

M 16

-

-

-

330-335
A, B, C, D

INBUS 6T
A > Page 404

BF 08DS06
B > Page 407

BF 13DS13
C > Page 407

BF13MW
D > Page 407



DRILL CHUCKS

diam. 2,5 - 16 mm

CNC precision Drill chucks

- suitable up to 7000 rev/min
- with internal coolant supply
- independent of rotating direction
- compact design
- delivery extent includes small and large seal ring

1/2 ▶

Arbor and Adapter Systems

catalogue no.

d₁

l₃

d₃

d₄

d₂

Form/DIN

l₂

l₁

ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD/B

NEW

	BF 2,5-16 750 IC	diam. 16	82	-	57	SK 40	DIN 69871 AD	-	-	A, B, C, D, E, F	
	 INBUS 6T A > Page 404	 KBSK40-69872A B > Page 406		 KBSK40-69872B C > Page 406		 BF 16DS06 D > Page 407		 BF 16DS16 E > Page 407			
	 BF13MW F > Page 407										

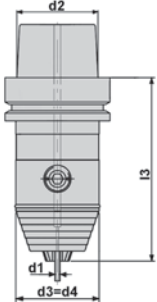
Int. taper 50 DIN 69 871 AD/B

NEW

	BF 2,5-16 710 IC	diam. 16	98	-	57	SK 50	DIN 69871 AD	-	-	A, B, C, D, E, F	
	 INBUS 6T A > Page 404	 KBSK50-69872A B > Page 406		 KBSK50-69872B C > Page 406		 BF 16DS06 D > Page 407		 BF 16DS16 E > Page 407			
	 BF13MW F > Page 407										

Hollow taper shank 50 E

NEW

	BF 2,5-16 E50 IC	diam. 16	101	-	57	HSK 50	form E	-	-	A, B, C, D, E, F	 
	 INBUS 6T A > Page 404	 KMR-50A B > Page 406		 SCHLUESSELHSK50 C > Page 406		 BF 16DS06 D > Page 407		 BF 16DS16 E > Page 407			
	 BF13MW F > Page 407										

Arbor and Adapter
Systems

catalogue no.

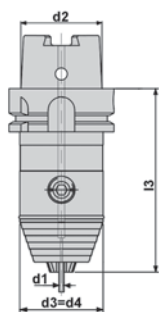
d₁l₃d₃d₄d₂

Form/DIN

l₂l₁ref. pg. arbors
ref. accessories
features

Hollow taper shank 63 A

NEW



BF 2,5-16 A63 IC

diam.
16

89

-

57

HSK
63

form A

-

-

A, B, C, D, E, F



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KMR-63A
B > Page 406

SCHLUESSELHSK63
C > Page 406

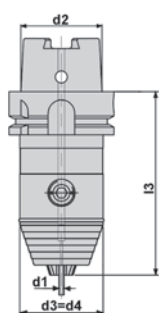
BF 16DS06
D > Page 407

BF 16DS16
E > Page 407

BF13MW
F > Page 407

Hollow taper shank 100 A

NEW



BF 2,5-16 A100 IC

diam.
16

83

-

57

HSK
100

form A

-

-

A, B, C, D, E, F



INBUS 6T
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KMR-100A
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SCHLUESSELHSK100
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BF 16DS06
D > Page 407

BF 16DS16
E > Page 407

BF13MW
F > Page 407

With threaded shank M 16

NEW



BF 2,5-16 M16 IC

diam.
16

100

50

50

M 16

-

-

-

330-335
A, B, C, D

INBUS 6T
A > Page 404

BF 16DS06
B > Page 407

BF 16DS16
C > Page 407

BF13MW
D > Page 407



FOR SHORT TAPER SHANKS

KK 3

These basic arbors allow extremely long and slim arbor combinations together with the new PokoIm short taper system. Especially designed for deep and narrow milling applications.

- SK, BT and HSK arbors are already pre-balanced; for balancing grades, see features

Arbor and Adapter Systems

catalogue no.

d_1

l_3

d_3

d_4

d_2

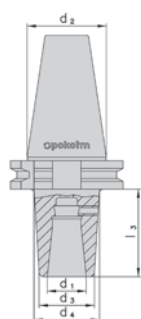
Form/DIN

l_2

l_1

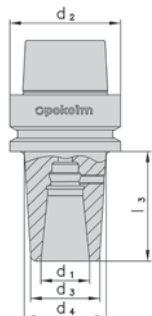
ref. pg. arbors
ref. accessories
features

Int. taper 40 DIN 69 871 AD



00 K3 750	KK 3	3	30	31	SK 40	DIN 69871 AD	-	-	A, B, C, D, E	
50 K3 750	KK 3	50	31	37.5	SK 40	DIN 69871 AD	-	-	A, B, C, D, E	
ZMIM8020M A > Page 402	ZSLL1275S B > Page 404				KBSK40-69872A C > Page 406		KBSK40-69872B D > Page 406		ZMKMA406S E > Page 407	

Hollow taper shanks 50 E



50 K3 E50	KK 3	50	31	37.5	HSK 50	form E	-	-	A, B, C, D, E	
ZMIM8020M A > Page 402	ZSLL1275S B > Page 404				KMR-50A C > Page 406		SCHLUESSELHSK50 D > Page 406		ZMKMA406S E > Page 407	

FOR DIRECT SPINDLE MOUNTING ADAPTERS

Flange contact surface d1 = 50

- centering arbor for direct spindle mounting of product group *740
- for milling machines with SK 50 - and HSK 100A-connections



Service

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Solid Carbide
End Mills

Arbor and Adapter
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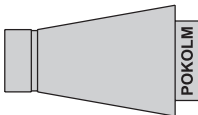
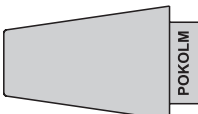
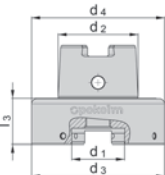
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		d ₁	l ₃	d ₃	d ₄	d ₂	Form/DIN	l ₂	l ₁				
centering arbor													
	50 742	diam. 50	-	-	-	SK 50	DIN 2080	-	-		☒		
centering arbor													
	50 743	diam. 50	-	-	-	SK 50	DIN 69871 AD	-	-	A, B	☒		
	 KBSK50-69872A A > Page 406	 KBSK50-69872B B > Page 406											
Hollow taper shanks 100 form A													
	40 740 A100	diam. 50	43.5	126	126	HSK 100	form A	-	-	A, B, C, D	☒ NEW 		
	 M12X35 A > Page 402	 GWST-M6X10-914 B > Page 403											
	 KMR-100A C > Page 406	 SCHLUES-SELHSK100 D > Page 406											

HIGH-SPEED SPINDLE SYSTEMS



MODERN SPINDLE UNITS FOR EFFECTIVE MILLINGS RESULTS

Many milling machines – both old and new – have a relatively low maximum speed. Low maximum speed does have advantages in roughing operations, but are a big drawback for achieving effective feed rates. Low speed also greatly limits the advantages of modern CNC applications. The results: much longer machining times and loss of valuable production capacities.

We offer a convincing solution for this situation: Pokolm-Voha high-speed spindle systems for the most profitable machining results.

BETTER SURFACE FINISH RESULTS AND GREATLY IMPROVED CYCLE TIME

The advantages are impressive: higher cutting speeds, utilization of maximum feed rates – even with the smallest end mills – better surface finish and a great reduction in the need for EDM. Results: much shorter machining times and full utilization of the CNC advantages.

Pokolm-Voha provides various spindle systems for individual adaptation to existing machines and operation requirements. Operating with an approach angle of these spindles in A and C direction by using our swivel device, increases the variety of applications of your milling machine.

Get the maximum speed from your machines with Pokolm-Voha spindle systems. The result: You save time!

Mould Making | Die Shops | Machine building | Model Making | Tool Making

High-Speed Spindle Systems

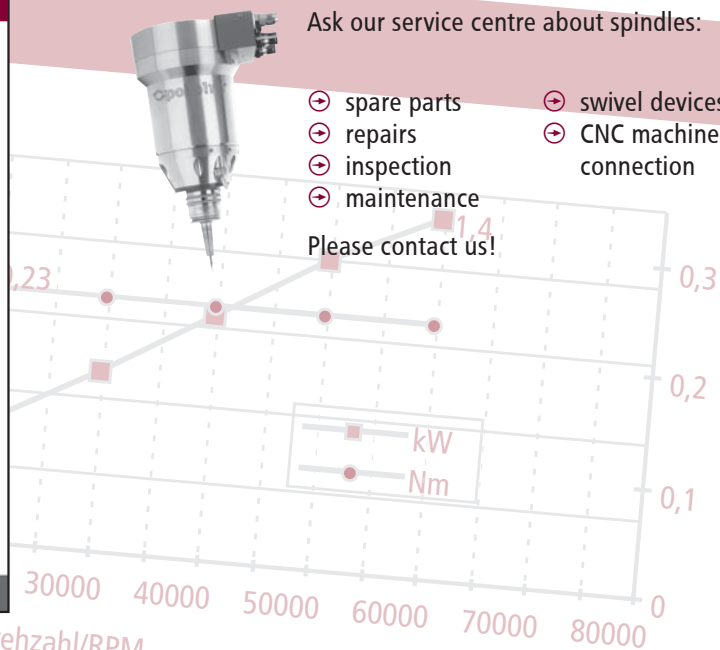


pokolm voha

Ask our service centre about spindles:

- ⊕ spare parts
- ⊕ repairs
- ⊕ inspection
- ⊕ maintenance
- ⊕ swivel devices
- ⊕ CNC machine connection

Please contact us!



INDUCTIVE SHRINKING TECHNOLOGY



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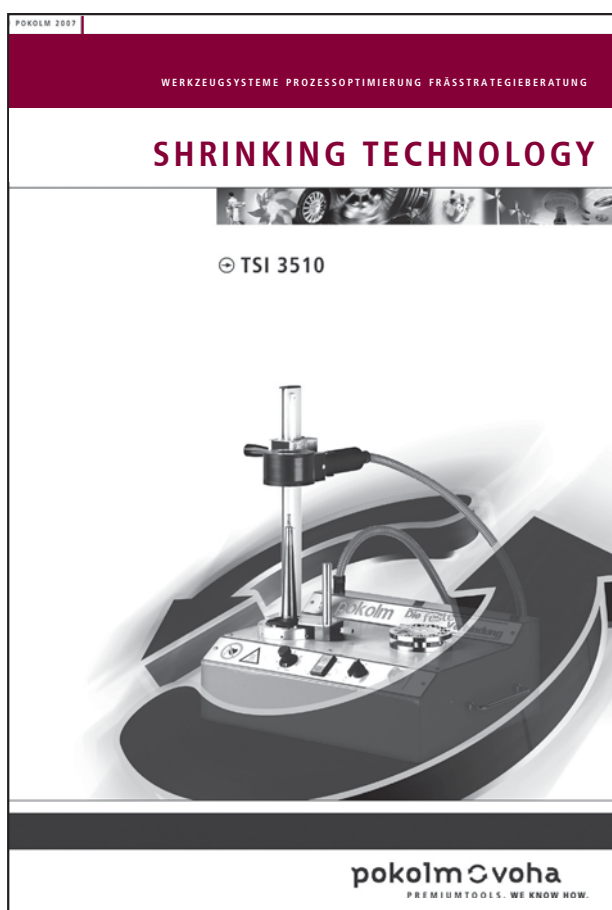
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FIRST OPERATION: SHRINKING, THEN MILLING

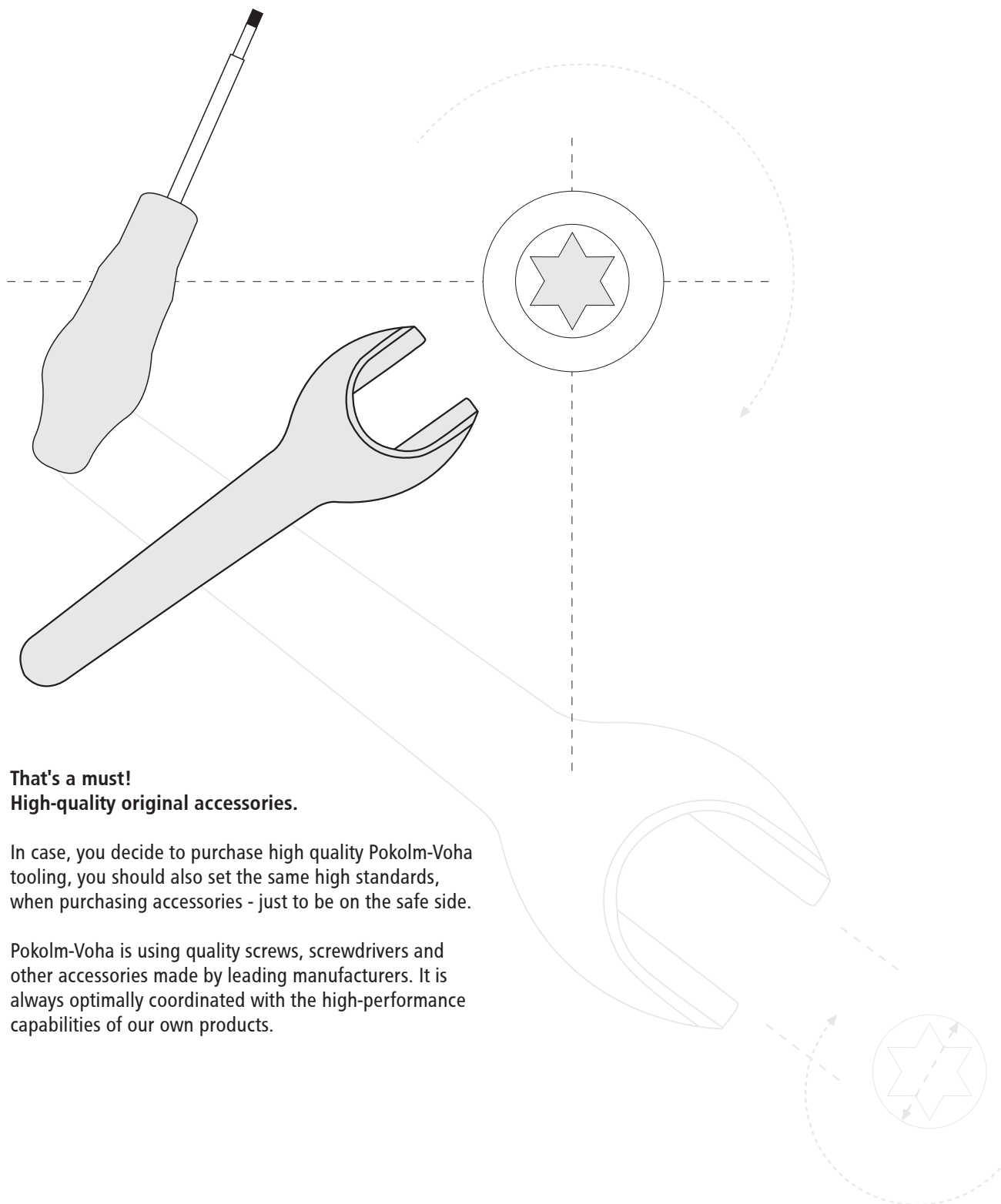
Shrinking Technology convinces everybody compared with conventional chucking methods from the past. What counts? Absolute concentricity and highest precision with extensive extended tool life. Shrinking technology offers a safe friction-locked connection between tool and tool holder and provides an increased transferable torque. And the qualification for maximum revolutions is the best precondition for an optimum surface finish and for reducing costs for expensive finishing processes.

Compared to conventional milling chucks, shrinking arbors allow the use of distinctly slim adaptors for machining components with narrow situations, which would be un-executable with other tool-holding systems.

Pokolm-Voha offers a substantial range of tooling for shrinking technology: several top-class Induction Shrinking Units, shrinking arbors for all possible machine connections and our patent-protected connection system DuoPlug® in combination with our "zero-reach"-shrinking arbors.

(Additional information about the Pokolm DuoPlug® System can be found under chapter "Milling Cutter Bodies" of this catalogue.)

ACCESSORIES



That's a must!
High-quality original accessories.

In case, you decide to purchase high quality Pokolm-Voha tooling, you should also set the same high standards, when purchasing accessories - just to be on the safe side.

Pokolm-Voha is using quality screws, screwdrivers and other accessories made by leading manufacturers. It is always optimally coordinated with the high-performance capabilities of our own products.

ACCESSORIES

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	Torx screws for ball nose inserts 401
	Locating screws 401
	Locking screws 401
Cylindrical screws with hexagon socket	for drive blocks 402
	for MTS-reduction sleeves 402
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Torque screwdrivers and accessories	Torque screwdrivers 404
	Torque Vario® setter adjusting tool 404
	Torx bits, standard 405
	Torx bits with retaining spring 405
Clamping claws	405
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Retention knobs without seal ring groove	406
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	hexagon key 407
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STARTING TORQUES FOR TORX® SCREWS

with the Pokolm-Voha Torque Screwdriver



Allowable starting torques for Torx® screws
in the Pokolm-Voha range of accessories.

Thread	Torx® size	Starting torque*[Ncm]
M 1,8	T 6	40
M 2,0	T 6	62
M 2,5	T 7 / T 8	128
M 3,0	T 9 / T 10	225
M 3,5	T 10 / T 15	345
M 4	T 15	515
M 4,5	T 20	760
M 5	T 20	1020

* Starting torques apply to screws of strength category 12.9 and result in a load factor of 90% of yield point and are based on a mean friction coefficient of 0.14 μ m.

The new Pokolm-Voha torque screwdrivers let you adjust your required starting torque quickly and easily.

Our adjustable torque screwdrivers can be safely operated because of the easily readable scale. With interchangeable bits for universal use.

The new TORX®
screwdrivers can be found in
this chapter (Accessories).

Your advantage:

The defined and reproducible fixture of indexable inserts and clamping elements in our milling cutter bodies ensures optimum retention forces, thus preventing damage to milling cutters, inserts, and screws.

High Standard of Quality: Pokolm-Voha uses quality screws and screwdrivers made by leading manufacturers. They are optimally coordinated with the high-performance capability of our products. All accessories can be found on the following pages.

Accessories

catalogue no.

Description

Dimensions

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End Mills

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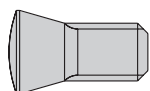
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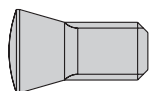
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Torx screws | Torx screws



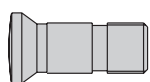
18 500	Torx screw M 1.8 L 3.7 T 6	M 1.8	L 3.7	T 6	
21 500	Torx screw M 2.0 L 3.3 T 6	M 2.0	L 3.3	T 6	
25 500	Torx screw M 2.5 L 5.0 T 7	M 2.5	L 5.0	T 7	
25 500 K	Torx screw M 2.5 L 4.5 T 7	M 2.5	L 4.5	T 7	
25 505 KP	Torx screw M 2.5 L 6.36 T 8 Plus	M 2.5	L 6.36	T 8 Plus	
25 505 P	Torx screw for Slotworx M M 2.5 L 7.3 T 8 Plus	M 2.5	L 7.3	T 8 Plus	
30 500	Torx screw M 3.0 L 7.0 T 10	M 3.0	L 7.0	T 10	
35 500	Torx screw M 3.5 L 7.5 T 15	M 3.5	L 7.5	T 15	
35 500 L	Torx screw M 3.5 11 T 15	M 3.5	11	T 15	
40 505 K	Torx screw M 4.0 L 9.35 T 15 Plus	M 4.0	L 9.35	T 15 Plus	
45 500	Torx screw M 4.5 L 10.0 T 20	M 4.5	L 10.0	T 20	
45 500 L	Torx screw M 4.5 14.5 T 20	M 4.5	14.5	T 20	

Torx screws | Torx screws for ball nose inserts



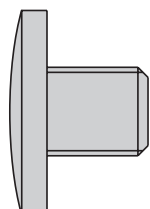
25 505	Torx screw for ball nose inserts M 2.5 L 6.36 T 8 Plus	M 2.5	L 6.36	T 8 Plus	
30 505	Torx screw for ball nose inserts M 3.0 L 7.25 T 9 Plus	M 3.0	L 7.25	T 9 Plus	
40 505	Torx screw for ball nose inserts M 4.0 L 10.58 T 15	M 4.0	L 10.58	T 15	

Torx screws | Locating screws

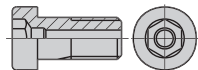


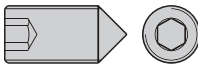
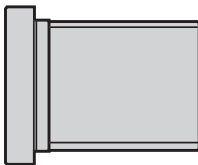
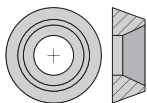
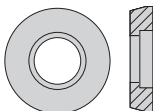
30 522	locating screw M 3.0 L 6.9 T 8	M 3.0	L 6.9	T 8	
35 520	locating screw M 3.5 L 7.6 T 10	M 3.5	L 7.6	T 10	
40 520	locating screw M 4.0 L 10.2 T 15	M 4.0	L 10.2	T 15	
50 520	locating screw M 5.0 L 13.5 T 20	M 5.0	L 13.5	T 20	

Torx screws | Locking screws



35 510	locking screw M 3.5 T 15	M 3.5		T 15	
35 511	locking screw M 3.5 T 10	M 3.5		T 10	

Accessories		catalogue no.	Description	Dimensions			
Cylindrical screws with hexagon socket for drive blocks							
	M6X16	screw for drive block 16 x 16 M 6 L 16 DIN 912	M 6	L 16	DIN 912		
	M5X12	screw for drive block 12 x 8 M 5 L 12 DIN 912	M 5	L 12	DIN 912		
	M4X10	screw for drive block 10 x 8 M 4 L 10 DIN 912	M 4	L 10	DIN 912		
	M3X10	screws for drive block 8 x 8 M 3 L 10 DIN 912	M 3	L 10	DIN 912		
	M5X16	screw for drive blocks 12 x 12 and 14 x 14 M 5 L 16 DIN 912	M 5	L 16	DIN 912		
	M12X35	screw M 12 L 20 DIN 912	M 12	L 20	DIN 912		
Cylindrical screws with hexagon socket for MTS-reduction sleeves							
	M10X40	screws for MTS-reduction sleeve M 10 L 40 DIN 912	M 10	L 40	DIN 912		
	M10X90	screws for MTS-reduction sleeve M 10 L 90 DIN 912	M 10	L 90	DIN 912		
	M10X140	screws for MTS-reduction sleeve M 10 L 140 DIN 912	M 10	L 140	DIN 912		
	M10X190	screws for MTS-reduction sleeve M 10 L 190 DIN 912	M 10	L 190	DIN 912		
	M12X40	screws for MTS-reduction sleeve M 12 L 40 DIN 912	M 12	L 40	DIN 912		
	M12X90	screws for MTS-reduction sleeve M 12 L 90 DIN 912	M 12	L 90	DIN 912		
	M12X135	screws for MTS-reduction sleeve M 12 L 135 DIN 912	M 12	L 135	DIN 912		
	M12X185	screws for MTS-reduction sleeve M 12 L 185 DIN 912	M 12	L 185	DIN 912		
	M16X50	screws for MTS-reduction sleeve M 16 L 50 DIN 912	M 16	L 50	DIN 912		
M20X50	screws for MTS-reduction sleeve M 20 L 50 DIN 912	M 20	L 50	DIN 912			
Cylindrical screws with hexagon socket for shell-type and threaded shank adapters							
	M6X25	screw M 6 L 25 DIN 912 12.9	M 6	L 25	DIN 912	12.9	
	M6X55	screw M 6 L 55 DIN 912 12.9	M 6	L 55	DIN 912	12.9	
	M6X90	screw M 6 L 90 DIN 912 12.9	M 6	L 90	DIN 912	12.9	
	M8X25	screw M 8 L 25 DIN 912 12.9	M 8	L 25	DIN 912	12.9	
	M8X55	screw M 8 L 55 DIN 912 12.9	M 8	L 55	DIN 912	12.9	
Cylindrical screws with hexagon socket for short-taper adapters							
	ZMIM8020M	screw for short taper adapters M 8	M 8				

Accessories							
catalogue no.		Description		Dimensions			
Additional screws and washers setscrew							
	GWST-M5X8-914	setscrew DIN551 with hole M 5 L 8 hexagon size 2.5 DIN 914		M 5	L 8	Allen size 2.5	DIN 914
	GWST-M6X10-914	setscrew M 6 L 10 hexagon size 3 DIN 914		M 6	L 10	Allen size 3	DIN 914
	GWST12ISK	setscrew with hexagon socket and tapered head M 12 L12 hexagon size 5 DIN 913		M 12	L12	Allen size 5	DIN 913
Additional screws and washers threaded and tapped bush							
	35 500 I	threaded and tapped bush internal M 3.5 external M 5 x 0.5 hexagon size 3,5		internal M 3.5	external M 5 x 0.5	Allen size 3,5	
	45 500 I	threaded and tapped bush internal M 4.5 external M 6 x 0,75 hexagon size 4,5		internal M 4.5	external M 6 x 0,75	Allen size 4,5	
Additional screws and washers hexagon socket set screw							
	GWSTPS8ISK	hexagon socket set screw M 8x1.25 M8x0.75 hexagon size 4		M 8x1.25	M8x0.75	Allen size 4	
Additional screws and washers Locking washers							
	10 510	locking washer diam. 11 for M 4.5		diam. 11	for M 4.5		
Additional screws and washers shim							
	09 511	Shim for RDHX 12T3 diam. 10		diam. 10			
	10 511	Shim for RDHX 1604 diam. 14		diam. 14			
Spanners / screwdrivers Torx srewwdrivers							
	06 500	Torx-screwdriver T 6		T 6			
	07 500	Torx-screwdriver T 7		T 7			
	08 500	Torx-screwdriver T 8		T 8			
	08 500 P	Torx-screwdriver T 8 Plus		T 8 Plus			
	09 500	Torx-screwdriver T 9		T 9			
	10 500	Torx-screwdriver T 10		T 10			
	15 500	Torx-screwdriver T 15		T 15			
	20 500	Torx-screwdriver T 20		T 20			

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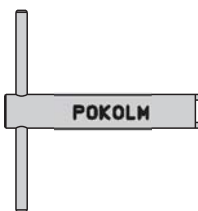
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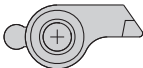
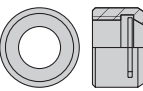
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Accessories		catalogue no.	Description	Dimensions			
Spanners / screwdrivers Spanner for tightning nut of ER20-collet chucks							
	20 501	spanner for ER 20 collet chuck tightening nut for M 24	for M 24				
Spanners / screwdrivers Spanners for reduction sleeves							
	1003	spanner for reduction sleeve for MTS 2 for MTS 3	for MTS 2	for MTS 3			
	1004	spanner for reduction sleeve for MTS 4	for MTS 4				
	1005	spanner for reduction sleeve for MTS 5	for MTS 5				
Spanners / screwdrivers Spanners for short taper adapters							
	ZSLL1275S	spanner for short taper adaptors diam. 12	diam. 12				
Spanners / screwdrivers Spanners for drill chucks							
	INBUS 4T	INBUS 4T SW4	SW4				
	INBUS 6T	INBUS 6T SW6	SW6				
Torque screwdrivers and accessories Torque screwdrivers							
	TV 1-5	Screwdriver torque Vario®-S with window scale from Nm 1.0 up to 5,0 Nm with scale	from Nm 1.0	up to 5,0 Nm	with scale		
	TV 2-8	Screwdriver torque Vario®-S with window scale from Nm 2.0 up to 8,0 Nm with scale	from Nm 2.0	up to 8,0 Nm	with scale		
	TV 04-1	Screwdriver torque Vario®-S with window scale from Nm 0.4 up to 1,0 Nm with scale	from Nm 0.4	up to 1,0 Nm	with scale		
	TV 08-2	Screwdriver torque Vario®-S with window scale from Nm 0.8 up to 2,0 Nm with scale	from Nm 0.8	up to 2,0 Nm	with scale		
Torque screwdrivers and accessories Torque Vario® setter adjusting tool							
	TV 500	Torque Vario® setter adjusting tool					

Accessories						
catalogue no.		Description	Dimensions			
Torque screwdrivers and accessories Torx bits, standard						
	T6 500	Torx interchangeable bit for Torque Vario® T 6 L 175 max. 0.6 Nm	T 6	L 175	max. 0.6 Nm	
	T7 500	Torx interchangeable bit for Torque Vario® T 7 L 175 max. 0.9 Nm	T 7	L 175	max. 0.9 Nm	
	T8 500	Torx interchangeable bit for Torque Vario® T 8 L 175 max. 1.3 Nm	T 8	L 175	max. 1.3 Nm	
	T9 500	Torx interchangeable bit for Torque Vario® T 9 L 175 max. 2.5 Nm	T 9	L 175	max. 2.5 Nm	
	T10 500	Torx interchangeable bit for Torque Vario® T 10 L 175 max. 3.8 Nm	T 10	L 175	max. 3.8 Nm	
	T15 500	Torx interchangeable bit for Torque Vario® T 15 L 175 max. 5.5 Nm	T 15	L 175	max. 5.5 Nm	
	T20 500	Torx interchangeable bit for Torque Vario® T 20 L 175 max. 8.0 Nm	T 20	L 175	max. 8.0 Nm	
Torque screwdrivers and accessories Torx bits with retaining spring						
	T6 502	Torx MagicSpring compatible bit f. Torque Vario® T 6 L 175 max. 0.6 Nm	T 6	L 175	max. 0.6 Nm	
	T7 502	Torx MagicSpring compatible bit f. Torque Vario® T 7 L 175 max. 0.9 Nm	T 7	L 175	max. 0.9 Nm	
	T8 502	Torx MagicSpring compatible bit f. Torque Vario® T 8 L 175 max. 1.3 Nm	T 8	L 175	max. 1.3 Nm	
	T9 502	Torx MagicSpring compatible bit f. Torque Vario® T 9 L 175 max. 2.5 Nm	T 9	L 175	max. 2.5 Nm	
	T10 502	Torx MagicSpring compatible bit f. Torque Vario® T 10 L 175 max. 3.8 Nm	T 10	L 175	max. 3.8 Nm	
	T15 502	Torx MagicSpring compatible bit f. Torque Vario® T 15 L 175 max. 5.5 Nm	T 15	L 175	max. 5.5 Nm	
	T20 502	Torx MagicSpring compatible bit f. Torque Vario® T 20 L 175 max. 8.0 Nm	T 20	L 175	max. 8.0 Nm	
Clamping claws						
	09 510	clamp claw for CBN inserts diam. 7	diam. 7			
	12 510	clamping claw for Trigaworx® S for M 2.5	for M 2.5			
Clamping finger						
	10 514	clamping finger for CBN with screw M 4.0 T 15	with screw M 4.0	T 15		
Union nuts						
	ER20 001	tightening nut ER 20 M 24 1.0	M 24	1.0		

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Systems/Shrinking
Technology

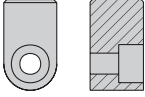
Accessories

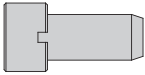
Customized
Products

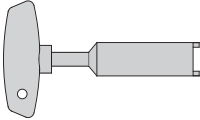
Operation Data

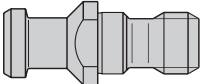
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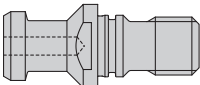
Accessories		catalogue no.	Description	Dimensions		
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Drive blocks						
	NUTEN8X8	drive block 8 x 8 8 8 L 12	8	8	L 12	
	NUTEN10X8	drive block 10 x 8 10 8 L 18	10	8	L 18	
	NUTEN12X8	drive block 12 x 8 12 8 L 20	12	8	L 20	
	NUTEN12X12	drive block 12 x 12 12 12 L 20	12	12	L 20	
	NUTEN12X12/2	drive block 12 x 12 12 12 L 20	12	12	L 20	
	NUTEN14X14	drive block 14 x 14 14 14 L 24	14	14	L 24	
	NUTEN16X16	drive block 16 x 16 16 16 L 24	16	16	L 24	

accessories for HSK tooling Coolant supply tube for HSK tooling						
	KMR-32	coolant supply tube for HSK-tooling for HSK 32 form A + E	for HSK 32	form A + E		
	KMR-40A	coolant supply tube for HSK-tooling for HSK 40 form A + E	for HSK 40	form A + E		
	KMR-50A	coolant supply tube for HSK-tooling for HSK 50 form A + E	for HSK 50	form A + E		
	KMR-63A	coolant supply tube for HSK-tooling for HSK 63 form A + E	for HSK 63	form A + E		
	KMR-80A	coolant supply tube for HSK-tooling for HSK 80 form A	for HSK 80	form A		
	KMR-100A	coolant supply tube for HSK-tooling for HSK 100 form A	for HSK 100	form A		

accessories for HSK tooling Spanners for coolant supply tube						
	SCHLUESSELHSK32	spanner for coolant tube HSK 32	HSK 32			
	SCHLUESSELHSK40	spanner for coolant tube HSK 40	HSK 40			
	SCHLUESSELHSK50	spanner for coolant tube HSK 50	HSK 50			
	SCHLUESSELHSK63	spanner for coolant tube HSK 63	HSK 63			
	SCHLUESSELHSK80	spanner for coolant tube HSK 80	HSK 80			
	SCHLUESSELHSK100	spanner for coolant tube HSK 100	HSK 100			

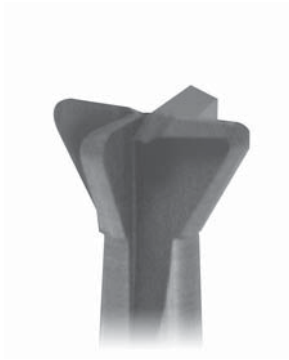
Retention knobs without seal ring groove						
	KBSK40-69872A	retention knob SK 40 DIN 69 872 A	SK 40	DIN 69 872 A		
	KBSK50-69872A	retention knob SK 50 DIN 69 872 B	SK 50	DIN 69 872 B		

Retention knobs with seal ring groove						
	KBSK40-69872B	retention knob with seal ring groove SK 40 DIN 69 872 B	SK 40	DIN 69 872 B		
	KBSK50-69872B	retention knob with seal ring groove SK 50 DIN 69 872 B	SK 50	DIN 69 872 B		

CUSTOMIZED PRODUCTS



Milling Cutter Bodies



Solid Carbide End Mills



Arbor Systems

State-of-the-Art –Our Customized Tool Offer

Many products in the Pokolm-Voha range originate as a response to individual customer demands and have been enhanced into successful standard products by consistent development. Meanwhile, Pokolm-Voha can provide you with tools and arbors, which are precisely coordinated with each other, and which can be combined in over 500,000 different ways to meet almost any demand for efficient milling. In our experience, about 90% of all milling applications in tool and mould-making can be completed using tools from this comprehensive standard range.

In addition, we produce customized tools and arbors for your special requirements according to your needs.

- ⊕ fast
- ⊕ reliable
- ⊕ on schedule

And always precisely coordinated with all the other components in the Pokolm-Voha tool system.

Use the already prepared inquiry forms on the following pages for your individual inquiry or purchase order. Certainly, you can also download these forms at any time from our web-site: www.pokolm-voha.com as a PDF-file.

Or visit our website www.sonderwerkzeuge.de, which offers a comprehensive overview of all available customized products. Here you can find many solutions immediately with a simple mouse click. This often avoids time-consuming new special products.

PURCHASE/INQUIRY FORM

Customized Solid Carbide/CBN and PKD Tools



Please fax to:

POKOLM: +49 5247 9361-99

VOHA: +49 2266 4781-40

(please copy prior to completion)

Inquiry No./P.O. No.:

Date:

Company:

Address:

Department:

Person in charge:

Phone:

Fax:

Email:

Requested delivery date

We adapt our basic substrate and coating optimally to your requirements and to the material to be machined. Please mark any special requirements:

Solid Carbide:

☐

KAC

☐

CBN

☐

UMGC

☐

MGC

☐

PKD

☐

left-hand cutting

Shank Style DIN 6535:

☐

Form HA (plain)

☐

Form HB (with clamping flats)

☐

Qty. required

Coating:

☐

PVAT

☐

PVAS

☐

PVCC

☐

PVCN

☐

PVDiaG

☐

PVALSA

☐

PVTi

☐

PVDiaN

☐

PVTiH

☐

Other: _____

Material to be machined:

Further details:

☐

No. of teeth

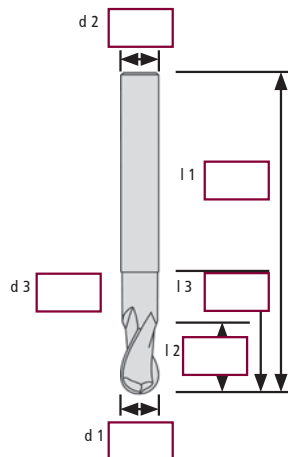
☐

Angle of helix

☐

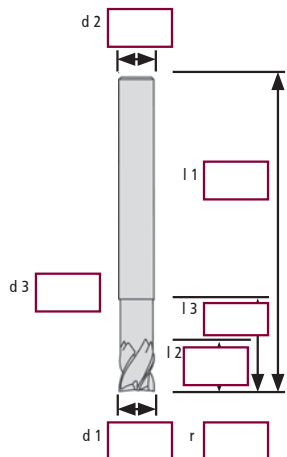
Straight teeth

Ball Nose End Mills:

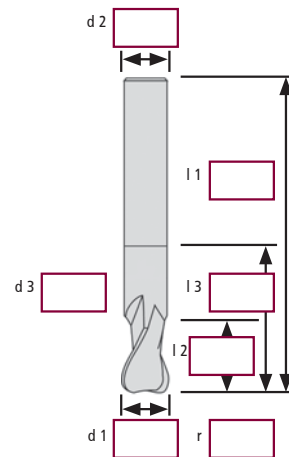


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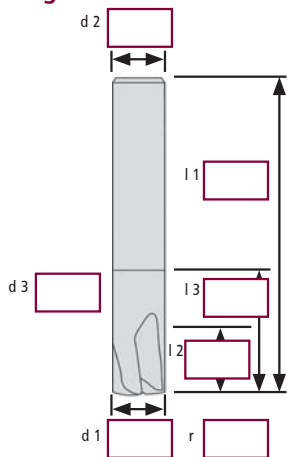
Corner Radius End Mills:



Toric End Mills:



Trigaworx®:



Indoor service:

Field service:

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PURCHASE/INQUIRY FORM

Customized Arbors

(please copy prior to completion)



Please fax to:

POKOLM: +49 5247 9361-99

VOHA: +49 2266 4781-40

Inquiry No./P.O. No.:

Date:

Company:

Address:

Department:

Person in charge:

Phone:

Fax:

Email:

Arbor for threaded shank end mill bodies

	Requested delivery date		angle	Surface treatment		Nickel		browned
	d ₄		d ₃		d ₁		SK	(size) (DIN)
	HRC		I ₁		r		HSK	(size) (form)
	Qty.		I ₃				Internal Coolant Supply	
	balance grade required							central bore
					Manufactured from material			through the collar

Arbor for Shell-type Milling Cutter Bodies

	angle		Nickel		browned
	d ₄		d ₃		d ₁
	HRC		I ₁		r
	Qty.		I ₃		
	balance grade required				Manufactured from material
					Internal Coolant Supply
					central bore
					through the collar

Shrinking Arbor

	angle		Nickel		brüniert
	d ₄		d ₃		d ₁
	HRC		I ₁		r
	Qty.		I ₃		
	balance grade required				Manufactured from material
					Internal Coolant Supply
					central bore
					through the collar

Note: For cylindrical design please fill in d3 and d4. 4 calendar weeks delivery time with browned surface.

Field service

Indoor service

PURCHASE/INQUIRY FORM

Customized Adapters

(please copy prior to completion)



Please fax to:

POKOLM: +49 5247 9361-99

VOHA: +49 2266 4781-40

Inquiry No./P.O. No.:

Date:

Company:

Address:

Department:

Person in charge:

Phone:

Fax:

Email:

Dense Antivibration Material Adapters for Threaded Shank End Mill Bodies

Requested delivery date d_4

Qty. with clamping flats
 Internal Coolant Supply

Solid Carbide Adapters for DuoPlug® System

Requested delivery date d_4

Qty. Internal Coolant Supply

Morse Taper Adapters for Threaded Shank End Mill Bodies

Requested delivery date d_4

Surface treatment Nickel browned

HRC MK Internal Coolant Supply

Material: Qty. Internal Coolant Supply

Note: For cylindrical design please fill in d3 and d4. 4 Calendar weeks delivery time with browned surface.

Indoor service

Field service

PURCHASE

Your purchase order by fax

(please copy prior to completion)



Please fax to:

POKOLM: +49 5247 9361-99

VOHA: +49 2266 4781-40

You can of course also place your order
with one of our applications engineers.

Catalogue no.	Description of item	Quantity	Price per item	Total price
Total				

Address:

Different delivery address

Company:

customer number (if known)

Company:

Department:

street

street

name

zip code, city

zip code, city

Our terms of sale are valid for this faxed purchase order.

PURCHASE

Your purchase order by fax
(please copy prior to completion)



Please fax to:

POKOLM: +49 5247 9361-99

VOHA: +49 2266 4781-40

You can of course also place your order
with one of our applications engineers.

Catalogue no.	Description of item	Quantity	Price per item	Total price
Total				

Address:

Different delivery address

Company:

customer number (if known)

Company:

Department:

street

street

name

zip code, city

zip code, city

Our terms of sale are valid for this faxed purchase order.

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TORX®-Größe	Anzugsmoment * [Ncm]
T 6	62
T 7	101
T 8	128
T 9	225
T 10	345
T 15	515
T 15	760
T 20	1020
T 20	1050
T 25	1750

$$V_f = 2275 \cdot 3 \cdot 0,6 = 4095 \text{ mm/min}$$

$$P = \frac{(25 \cdot 1,5 \cdot 4095)}{18000} = 8,5 \text{ kW}$$

W.Nr.	DIN	Europäische Norm	Frankreich AFNOR	Großbritannien BS	Japan JIS	Italien UNI	Schweden SS	Spanien UNE/EN/ASA	USA AISI/SAE
1.0037	St37-2	S235JR	E34-2	37/23 HR	SN 400 B	Fe 360 B FU	1311	AE 235 B	1015
1.0044	St44-2	S275JR	E28-2	43/25 HR	SN 400 B	Fe 430 B FN	1412	AE 275 B	1020
1.0050	St50-2G	E295	A50-2	4360	SS 490	Fe 490	1550 / 2172	A 490	-
1.0070	St70-2G	E360	A70-2	4360	-	Fe 690	1655	A 690	-
1.0570	St52-3	S355J2G3	E36-3	50/35 HR	SM490A;B;C;YA;YB	Fe 510/Fe 52 B FN/Fe 52 C FN	2132 / 2134	AE 355 D	1024
1.1141	CK15	C15E	XC 18	080 M 15	S15C	C16	1370	C15K	1015/1017
1.1191	CK45	C45E	XC 45	080 M 46	S45C	C45	1672	C45E	1042/1045
1.1730	C45W	C45U	Y3 42 / Y 3 48	EN 43 B	-	-	1672	E114	1045
1.7131	16MnCr5	16MnCr5	16 MC 5	527 M 17	-	16MnCr5	2173/2511	E1516	5115/5117
1.2067	100Cr6	102Cr6	Y100C6	BL3	SUJ 2	-	-	100Cr6	L3
1.2162	21MnCr5	21MnCr5	-	-	-	-	-	-	-
1.2307	29CrMoV9	29CrMoV9	-	-	-	-	-	-	-
1.2311	40Cr/Mn Mo7	35 CrMo 8	-	-	-	35 CrMo 8 KU	-	E5263	P20
1.2312	40Cr/Mn MoS8-6	-	-	-	-	-	-	X210CrW12	P20+1
1.2323	48CrMo V6-7	-	-	-	-	-	-	-	-
1.2341	6CrMo 15-5	5 CrMo 16	-	-	-	-	-	-	-
1.2347	X37Cr	-	-	-	-	-	-	-	-

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MATERIAL GROUP CROSS REFERENCES

		M. No.	DIN	European Standard	France AFNOR	Great Britain BS	Japan JIS	Italia UNI	Sweden SS	Spain U.N.E./I.H.A	USA AISI/SAE
Steel	Free Machining Steel/ Mild Steel	1.0037	St37-2	S235JR	E34-2	37/23 HR	SN 400 B	Fe 360 B FU	1311	AE 235 B	1015
		1.0044	St44-2	S275JR	E28-2	43/25 HR	SN 400 B	Fe 430 B FN	1412	AE 275 B	1020
		1.0050	St50-2G	E295	A50-2	4360	SS 490	Fe 490	1550/2172	A 490	-
		1.0070	St70-2G	E360	A70-2	4360	-	Fe 690	1655	A 690	-
		1.0570	St52-3	S355J2G3	E36-3	50/35 HR	SM490 A;B;C;YA;YB	Fe 510/Fe52B FN/Fe52 CFN	2132/2134	AE 355 D	1024
		1.1141	Ck15	C15E	XC 18	080 M 15	S15C	C16	1370	C15K	1015 / 1017
		1.1191	Ck45	C45E	XC 45	080 M 46	S45C	C45	1672	C45E	1042 / 1045
		1.1730	C45W	C45U	Y3 42 / Y3 48	EN 43 B	-	-	1672	F.114	1045
		1.7131	16MnCr5	16MnCr5	16 MC 5	527 M 17	-	16MnCr5	2173/2511	F.1516	5115 / 5117
	Normal Tool Steels/ Steel Castings	1.2067	100Cr6	102Cr6	Y100C6	BL 3	SUJ 2	-	-	100Cr6	L3
		1.2162	21MnCr5	21MnCr5	-	-	-	-	-	-	-
		1.2307	29CrMoV9	29CrMoV9	-	-	-	-	-	-	-
		1.2311	40CrMnMo7	35CrMo 8	-	-	-	35CrMo8KU	-	F.5263	P20
		1.2312	40CrMn MoS8-6	-	-	-	-	-	-	X210CrW12	P20+1
		1.2323	48CrMoV6-7	-	-	-	-	-	-	-	-
		1.2341	6CrMo15-5	5CrMo16	-	-	-	-	-	-	P4
		1.2343	X37CrMoV5-1	X37CrMoV5-1	Z38CDV5	BH 11	SKD 6	X37Cr MoV51KU	X37CrMo V5-1	X37Cr MoV5-1	H11
		1.2344	X40CrMoV5-1	X40CrMoV5-1	Z40CDV5	BH 13	SKD 61	X40CrMo V511KU	2242	X40Cr MoV5-1	H13
		1.2842	90MnCrV8	90MnCrV8	90MV 8	BO 2	-	90 MnCrV 8 KU	-	F.5229	O2
	Tools Steels, Chrome-Nickel Alloys, Steel castings, difficult to machine	1.2080	X210Cr12	X210Cr12	Z200C12	BD 3	SKD 1	-	X210Cr12	X210Cr12	D3
		1.2363	X100CrMoV5	X100CrMoV5	Z100CDV5	BA 2	SKD 12	X205 Cr12KU	2260	X100CrMoV5	A2
		1.2369	81MoCr V42-16	-	-	-	-	X100CrMoV5 1KU	-	-	613
		1.2379	X153Cr-MoV12	X153Cr-MoV12	Z 160 CDV 12	BD 2	SKD10/ SKD11	X155CrV Mo121KU	2310	X153Cr-MoV12	D2
		1.2567	30WCrV17-2	X30WCrV53	-	-	SKD 4	-	-	-	-
		1.2708	54NiCrMoS 6	-	-	-	-	-	-	-	-
		1.2713	55NiCrMoV6	55 NiCrMoV 7	-	-	(SKT4)	-	-	F.520.S	L6

		M.-No.	DIN	European Standard	France AFNOR	Großbritanni-en BS	Japan JIS	Italia UNI	Sweden SS	Spain U.N.E./I.H.A	USA AISI/SAE
High-temperature Alloys	Steel	1.2738	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4	-	-	-	-	-	-	-
	Tools Steels, Chrome-Nickel Alloys, Steel castings	1.2767	45NiCrMo16	45NiCrMo16	-	-	SKT 6	40NiCrMo V16KU	-	-	-
		1.6358	XNiCo Mo18-9-5	-	-	-	-	-	-	-	-
	Heat-resistance Alloys	1.3401	X120Mn12	-	Z120M12	BW 10	SCMnH 1	G-X120Mn12	2183	F.8251	-
		1.4865	GX40NiCr Si38-19	GX40NiCr Si38-19	GX40NiCr Si38-19	3330 C 11 / 331 C 40	SCH 15	GX40NiCr Si38-19	GX40NiCr Si38-19	GX40NiCr Si38-19	-
		2.4375	NiCu30Al (Monel K-500)	-	(NU30AT)	NA 18	-	-	-	-	Monel K-500
		2.4610	NiMo16Cr16Ti (Almenit 4610)	-	-	NA 45	-	-	-	-	Hastelloy C-4
		2.4619	NiCr22Mo7Cu (Coralloy 4619)	-	-	-	-	-	-	-	Hastelloy G-3
		2.4631	NiCr20TiAl (Nimonic 80A)	Ni-P95-HAT (AECMA)	NC 20 TA	(2HR201; HR401,601)	NCF 80A	-	-	-	Nimonic 80 A; HEV 5
		2.4636	NiCo15Cr15Mo AlTi (Dux 4636)	-	-	HR 4	-	-	-	-	Nimonic 115
		2.4648	EL-NiCr19Nb (FoxNibas 70/20)	-	-	-	-	-	-	-	-
		2.4668	NiCr19NbMo (Inconel 718)	NiCr19Fe19 Nb5Mo3	NC19FeNb	NiCr19Fe19 Nb5Mo3	NCF 718	NiCr19Fe19 Nb5Mo3	NiCr19Fe19 Nb5Mo3	NiCr19Fe19 Nb5Mo3	Inconel 718 XEV-I
		2.4856	NiCr22Mo9Nb (Inconel 625)	NiCr-22MO9Nb	NC22FeDNb	NA 43/Na 21	NCF 625	NiCr-22MO9Nb	NiCr-22MO9Nb	NiCr-22MO9Nb	Inconel 625
	Titanium Alloys	-	Ti99,5 HB 30-200	-	-	-	-	-	-	-	-
		-	Ti99,6 HB 30-170	-	-	-	-	-	-	-	-
		-	Ti99,7 HB 30-150	-	-	-	-	-	-	-	-
		-	Ti99,8 HB 30-120	-	-	-	-	-	-	-	-
		-	TiAl6V4ELI	-	-	TA11	-	-	-	-	AMS R56401
		-	TiAl5Sn2.5	-	T-A5E	TA14/17	-	-	-	-	AMS 54520
		3.7025	Ti 1	-	-	2 TA 1	-	-	-	-	AMS R50250
		3.7124	TiCu2	-	-	2 TA21-24	-	-	-	-	-
		3.7145	TiAl6Sn2 Zr4Mo2Si	-	-	-	-	-	-	-	AMS R54620
		3.7165	TiAl6V4	-	T-A6V	TA10-13 / TA28	-	-	-	-	AMS R56400
		3.7175	TiAl6V6Sn2	-	-	-	-	-	-	-	-
		3.7184	TiAl4Mo4Sn2	-	-	-	-	-	-	-	-
		3.7185	TiAl4Mo4Sn2	-	-	TA 45-51; TA57	-	-	-	-	-
		3.7225	Ti 1 Pd	-	-	TP1	-	-	-	-	AMS 52250

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		M.-No.	DIN	European Standard	France AFNOR	Great Britain BS	Japan JIS	Italia UNI	Sweden SS	Spain U.N.E./I.H.A	USA AISI/SAE
Stainless Steel	all sorts	1.2316	X38CrMo17	X38CrMo16	Z38CD16-01	X38CrMo16	-	X38CrMo16	-	F.5267	-
		1.2367	X38CrMoV5-3	X38CrMoV5-3	Z38CDV5-3	X38CrMoV5-3	-	X38CrMoV5-3	X38CrMoV5-3	X38CrMoV5-3	-
		1.3543	X102CrMo17	X108CrMo17	Z100CD17	X108CrMo17	SUS 440C	X105CrMo17	X108CrMo17	F.3425	440 C
		1. 4059	GX22CrNi17	-	Z20CN 17.2M	ANC 2	-	-	-	-	-
		1.4122	GX35CrMo17	X39CrMo17-1	Z38CD 16.1CI	X39CrMo17-1	-	X39CrMo17-1	X39CrMo17-1	X39CrMo17-1	-
		1.4301	X5CrNi18-10	X5CrNi18-10	Z6CN18.09	304 S 15	SUS 304	X5CrNi1810	2332	F.3504	304
		1.4305	X12CrNiS18-8	X8CrNiS18-9	Z8CNF18-09	303 S 31	SUS 303	X10CrNiS18-9	2346	F.310.C	303
		1.4340	GX40CrNi27-4	-	-	-	-	G X 35 CrNi 28 05	-	-	-
		1.4401	X5CrNiMo 17-12-2	X5CrNiMo 17-12-2	Z7CND 17-11-02	316 S 33	SUS 316	X5CrNiMo 17 12	2347	F.3534	316
		1.4462	X2CrNiMoN 22-5-3	X2CrNiMoN 22-5-3	Z2CND 22-06-03	318 S 13	SUS 329J3L	X2CrNiMoN 22-5-3	2377	X2CrNiMoN 22-5-3	S31803/ S32205
		1.4541	X10CrNiTi18-9	X6CrNiTi18-10	Z6CNT 18-10	321 S 31	SUS 321	X6CrNiTi18-10	2337	F.3523	321
		1.4551	X10CrNi 18-9	X5CrNiNb 20 10 KE	Z6CNNb 20-10	-	SUS Y 374	-	-	-	-
		1.4571	X10CrNiMo Ti18-10	X6CrNiMo Ti17-12-2	Z6 CNDT 17-12	320 S 31	SUS 316Ti	X6CrNiMo Ti17-12	2350	F.3535	316Ti
		1.4712	X10CrSi6	-	-	-	-	-	-	-	-
		1.4742	X10CrAl18	X10CrSi18	Z10CAS18	430 S 15	SUS 430	X8Cr17	-	F.3113	430
Cast Iron	Grey Cast Iron	0.6010	GG10	EN-GJL-100	Ft10D	GRADE100	FC 10	G10	0110-00	FG 10	NO 20 B
		0.6020	GG20	EN-GJL-200	Ft20D	GRADE200	FC 20	G20	0120-00	FG 20	No 30 B
		0.6030	GG30	EN-GJL-300	Ft30D	GRADE300	FC 30	G30	0130-00	FG 30	No 45 B
		0.6040	GG40	EN-GJL-350	Ft35D	GRADE350	FC 35	G35	0135-00	FG 35	-
	Spheroidal Graphite	0.7040	GGG-40	EN-GJS-400-15	FGS 400-12	SNG 420/12	FCD 400	GS 400/12	07 17-02	FGE 38-17	60-40-18
		0.7050	GGG-50	EN-GJS-500-7	FGS 500-7	SNG 500/7	FCD 500	GS 500/7	07 27-02	FGD 50-7	65-45-12
		0.7060	GGG-60	EN-GJS-600-3	FGS 600-7	SNG 600/3	FCD 600	GS 600/3	07 32-03	FGE 60-2	80-55-06
		0.7070	GGG-70	EN-GJS-700-2U	FGS 700-2	SNG 700/2	FCD 700	GS 700/2	07 37-01	FGS 70-2	100-70-03
		0.7080	GGG-80	EN-GJS-800-2	FGS 800-2	SNG 800/2	FCD 800	GS 800/2	-	-	120-90-02
	Tempered Castings	GTS 35-10	EN-GJMB-350-10	MN 35-10	B 340/12	-	-	08 15	-	32510	-
		GTS 45-06	EN-GJMB-450-6	-	P 440/7	-	-	08 52	-	40010	-
		GTS 55-04	EN-GJMB-550-4	MP 50-5	P 510/4	-	-	08 54	-	50005	-
		GTS 65-02	EN-GJMB-650-2	MP 60-3	P 570/3	-	-	08 85	-	70003	-

		M.-No.	DIN	European Standard	France AFNOR	Great Britain BS	Japan JIS	Italia UNI	Sweden SS	Spain U.N.E./I.H.A	USA AISI/SAE
Non-ferrous Materials	Aluminum	3.0255	Al99.5	EN-AW-1050A	A59050C	L31/L34/L36	-	-	-	-	1000
		3.1325	AlCuMg1	EN-AW-2017A	-	-	-	-	-	-	-
		3.2163	G-AlSi9Cu3	EN-AC-46200	-	-	-	-	-	-	-
		3.2315	AlMgSi1	EN-AW-6082	-	-	-	-	-	-	-
		3.2383	G-AlSi10Mg	-	-	LM 9	-	-	4253	-	A 360.2
		3.2581	G-AlSi12	EN-AW-2017A	-	LM 6	-	-	4261	-	A 413.2
		3.3535	AlMg3	EN-AW-5754	-	-	-	-	-	-	-
		3.4345	AlZnMgCu0,5	EN-AW-7022	AZ4GU/9051	L 86	-	-	-	-	7050
		3.5105	GMgZn4 SE1Zr1	-	G-Z4TR	MAG 5	-	-	-	-	ZE 41
		3.5812	G-MgAl8Zn1	-	G-A9	MAG 1	-	-	-	-	AZ 81
	Copper	-	CuMn5F36	-	-	-	-	-	-	-	-
		-	CuSi2MnF34	-	-	-	-	-	-	-	-
		-	E-Cu57	-	-	-	-	-	-	-	-
		-	CuZn15	-	CuZn 15	CZ 102	-	-	-	-	C 23000
		-	CuZn30	-	CuZn 30	CZ 106	-	-	-	-	C 26000
		-	CuZn37	-	CuZn 37	CZ 108	-	C2720	-	-	C 27700
		-	CuZn36Pb3	-	-	-	-	-	-	-	-
		-	G-CuZn34Al2	-	U-Z36N 3	HTB 1	-	-	-	-	C 86200
		-	G-CuSn5ZnPb	-	U-E5Pb5Z5	LG 2	-	-	-	-	C 83600
		-	G-CuPb10Sn	-	U-E10Pb10	LB 2	-	-	-	-	C 93700
		-	CuCrZr	-	U-Cr 0,8 Zr	CC 102	-	-	-	-	C 18200
		-	ISO-63	-	-	-	-	-	-	-	-
	Graphite	-	ISO-90	-	-	-	-	-	-	-	-
		-	ISO-93	-	-	-	-	-	-	-	-
		-	ISO-95	-	-	-	-	-	-	-	-
		-	ISO-95	-	-	-	-	-	-	-	-
	Plastics	-	Ureol® 5211 A/B	-	-	-	-	-	-	-	-
		-	Ureol® 5212 A/B	-	-	-	-	-	-	-	-
		-	Ureol® 5213 A/B	-	-	-	-	-	-	-	-
		-	Ureol® 5214 A/B	-	-	-	-	-	-	-	-
		-	Ureol® 5215 A/B	-	-	-	-	-	-	-	-
		-	Ureol® 5216 A/B	-	-	-	-	-	-	-	-
		-	Ureol® 5217 A/B	-	-	-	-	-	-	-	-
		-	Ureol® 5218 A/B	-	-	-	-	-	-	-	-
		-	Ureol® 5219 A/B	-	-	-	-	-	-	-	-

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Hardened Steel	up to 48HRC	1.2311	40CrMnMo7	35CrMo 8	-	-	-	35CrMo 8 KU	-	-	-
		1.2312	40CrMn-MoS8-6	-	-	-	-	-	-	-	-
		1.2323	48CrMoV6-7	-	-	-	-	-	-	-	-
		1.2343	X38CrMoV5-1	X37CrMoV5-1	Z38CDV 5	BH 11	SKD 6	X37CrMo V51 KUa	X37CrMoV5-1	F.520.G	H 11
		1.2344	X40CrMoV51	X40CrMoV5-1	Z40CDV 5	BH 13	SKD 61	X40CrMo V 5 1 1 KU	2242	X40CrMo V 5-1	H 13
		1.2708	54NiCrMoS6	-	-	-	-	-	-	-	-
		1.2842	90MnCrV8	90MnCrV8	90Mv8	BO 2	-	90MnVCr 8 KU	90MnCrV8	F.5229	O 2
	up to 55HRC	1.2080	X210Cr12	X210Cr12	Z200C12	BD 3	SKD 1	X210Cr12	X210Cr12	F.521	D 3
		1.2323	48CrMoV6-7	-	-	-	-	-	-	-	-
		1.2344	X40CrMoV5-1	X40CrMoV5-1	Z40CDV5	BH 13	SKD 61	X40CrMoV5-1	2242	X40CrMoV5-1	H 13
		1.2363	X100Cr-MoV51	X100CrMoV5	Z100CDV5	BA 2	SKD 12	X100CrMoV5	2260	X100CrMoV5	A 2
		1.2369	81MoCrV 42-16	-	-	-	-	-	-	-	613
		1.2379	X155CrV-Mo12-1	X153Cr-MoV12	Z160CDV12	BD 2	SKD 11	X153Cr-MoV12	2310	X153Cr-MoV12	D 2
		1.2567	30WCrV17-2	X30WCrV53	-	-	SKD 4	-	-	-	-
		1.2708	54NiCrMoS6	-	-	-	-	-	-	-	-
		1.2713	55NiCrMoV6	55NiCrMoV7	55NCDV7	-	SKT 4	-	-	F.520.S	L 6
		1.2738	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4	40CrMnNi Mo8-6-4
		1.2767	X45NiCrMo4	45NiCrMo16	45NiCrMo16	45NiCrMo16	SKT 6	45NiCrMo16	45NiCrMo16	45NiCrMo16	-
		1.2842	90MnCrV8	90MnCrV8	90MnCrV8	BO 2	-	90MnCrV8	90MnCrV8	90MnCrV8	O 2
	up to 65HRC	1.2080	X210Cr12	X210Cr12	Z200C12	BD 3	SKD 1	X210Cr12	X210Cr12	X210Cr12	D 3
		1.2363	X100CrMoV5	X100CrMoV5	Z100CDV5	BA 2	SKD 12	X100CrMoV5	2260	X100CrMoV5	A 2
		1.2369	81MoCrV 42-16	-	-	-	-	-	-	-	613
		1.2379	X153Cr-MoV12	X153Cr-MoV12	Z160CDV12	BD 2	SKD 10	X153Cr-MoC12	2310	X153Cr-MoC12	D 2
		1.2767	45NiCrMo16	45NiCrMo16	45NiCrMo16	45NiCrMo16	SKT 6	45NiCrMo16	45NiCrMo16	45NiCrMo16	-
		1.2842	90MnCrV8	90MnCrV8	90MnCrV8	BO 2	-	90MnCrV8	90MnCrV8	90MnCrV8	O2

HARDNESS CONVERSION TABLE

Tensile Strength, Vickers-, Brinell- und Rockwell Hardness

Tensile Strength R_m N/mm ²	Vickers Hardness HV10	Brinell Hardness HB	Rockwell Hard- ness HRC
255	80	76,0	
270	85	80,7	
285	90	85,5	
305	95	90,2	
320	100	95,0	
335	105	99,8	
350	110	105	
370	115	109	
385	120	114	
400	125	119	
415	130	124	
430	135	128	
450	140	133	
465	145	138	
480	150	143	
495	155	147	
510	160	152	
530	165	156	
545	170	162	
560	175	166	
575	180	171	
595	185	176	
610	190	181	
625	195	185	
640	200	190	
660	205	195	
675	210	199	
690	215	204	
705	220	209	
720	225	214	
740	230	219	
755	235	223	
770	240	228	20,3
785	245	233	21,3
800	250	238	22,2
820	255	242	23,1
835	260	247	24,0
850	265	252	24,8
865	270	257	25,6
880	275	261	26,4
900	280	266	27,1
915	285	271	27,8
930	290	276	28,5
950	295	280	29,2
965	300	285	29,8
995	310	295	31,0
1030	320	304	32,2
1060	330	314	33,3
1095	340	323	34,4
1125	350	333	35,5

Tensile Strength R_m N/mm ²	Vickers Hardness HV10	Brinell Hardness HB	Rockwell Hard- ness HRC
1155	360	342	36,6
1190	370	352	37,7
1220	380	361	38,8
1255	390	371	39,8
1290	400	380	40,8
1320	410	390	41,8
1350	420	399	42,7
1385	430	409	43,6
1420	440	418	44,5
1455	450	428	45,3
1485	460	437	46,1
1520	470	447	46,9
1555	480	456*	47,7
1595	490	466*	48,4
1630	500	475*	49,1
1665	510	485*	49,8
1700	520	494*	50,5
1740	530	504*	51,1
1775	540	513*	51,7
1810	550	523*	52,3
1845	560	532*	53,0
1880	570	542*	53,6
1920	580	551*	54,1
1955	590	561*	54,7
1995	600	570*	55,2
2030	610	580*	55,7
2070	620	589*	56,3
2105	630	599*	56,8
2145	640	608*	57,3
2180	650	618*	57,8
	660		58,3
	670		58,8
	680		59,2
	690		59,7
	700		60,1
	720		61,0
	740		61,8
	760		62,5
	780		63,3
	800		64,0
	820		64,7
	840		65,3
	860		65,9
	880		66,4
	900		67,0
	920		67,5
	940		68,0

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CLASSIFICATION OF CARBIDE MATERIAL GRADES INDEXABLE INSERTS FOR MILLING

Designation of main groups of chip removal and groups of application according to ISO 513

DESIGNATION	RANGE OF APPLICATION											MATERIAL TO BE MACHINED					
	1	5	10	15	20	25	30	35	40	45	50	Steel	Stainless	Cast-Iron	Alloys	High-temperature	Hardened Steel
CBN Steel																	
BN-K10																	●
CBN Cast Iron																	
BN-K20													●				
HSC 05 PVTi																	
HC-P10												●					
HC-K05													●	○			●
HSC 05 PVFN																	
HC-P10												●					
HC-K05													●	○			●
K 10																	
HW-M15													○				
HW-K10															●		
K10 PVTi																	
HC-M15													○			○	
HC-K10													●	●			○
P25 PVGO																	
HC-P25												○					
HC-M25													●			●	
P25 PVTi																	
HC-P25												●					
HC-K20													○				
P40 PVTi																	
HC-P40												●					
P40 PVGO																	
HC-P35												●					
HC-M35													○				
HC-K30													●				
P40 PVSR																	
HC-P30												●					
HC-K25													○				○
P40 PVML																	
HC-P35												●					
HC-M35													○				
P40 PVGM																	
HC-P40												○					
HC-M40													●			●	
M40 PVST																	
HC-P40												○					
HC-M40													●			●	

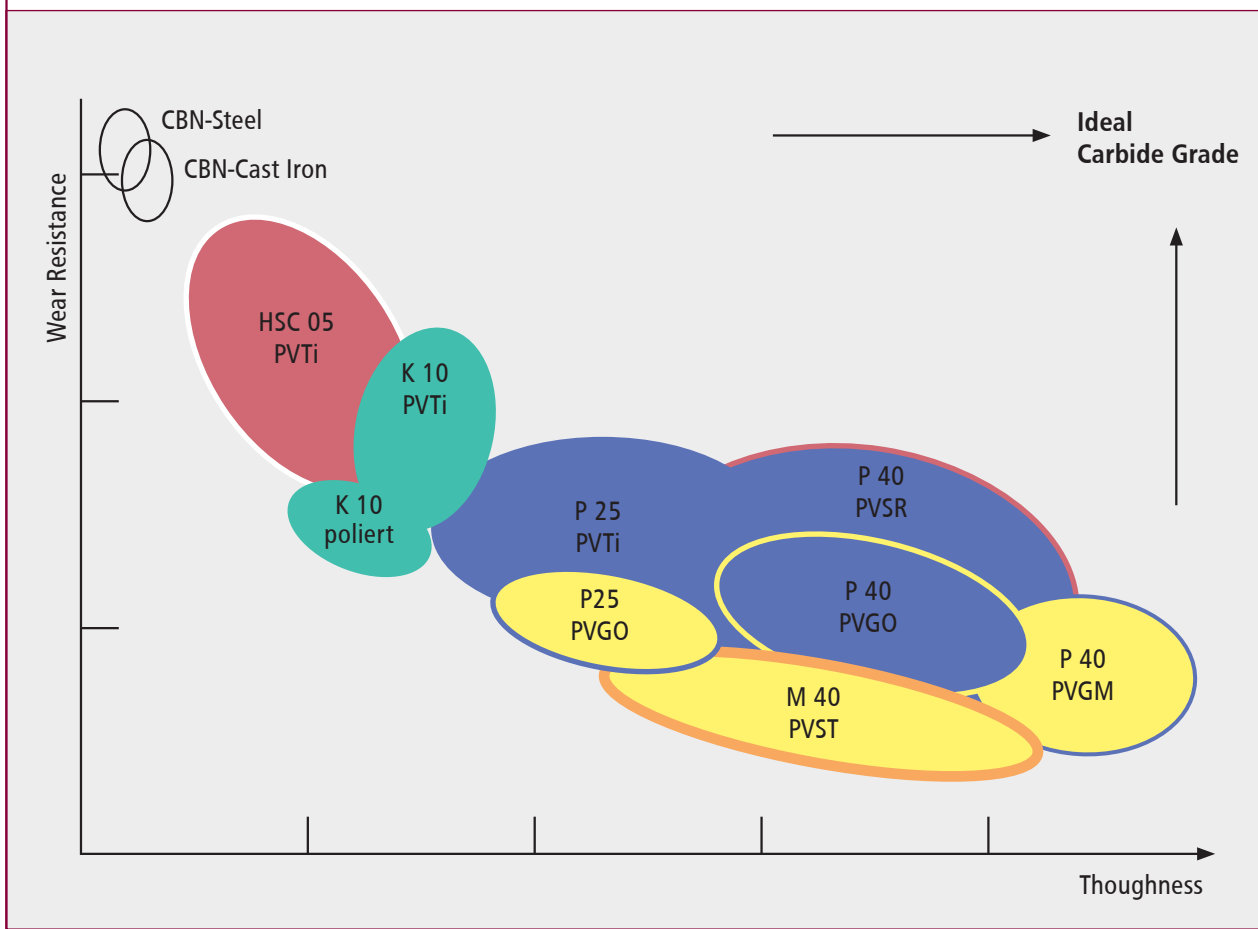
● Major application ○ Minor application

Full colour circle symbols represent: Major applications for materials to be machined.
Hollow colour circle symbols represent: Minor applications for materials to be machined.
The upper point of the pentagon-symbol indicates major applications. Sloping sides to the right or left indicate minor applications.

DIAGRAM WEAR RESISTANCE/THOUGHNESS

For classification of the main carbide grades for milling according to its wear resistance and toughness

This diagram shows the ratio of wear resistance to toughness of our main carbide grades for milling applications. It displays extended operative ranges, shows possibilities of supplementary use and alternatives of main grades in case of different kinds of tool wear. It also illustrates the multiplicity of the operative range.



CUTTING SPEEDS V_c IN M/MIN

MILLING CUTTERS WITH INDEXABLE INSERTS

Material	CUTTING MATERIAL AND COATING							
	Application	H5C05 PVTi PVFN	K05 PVTi	K10 PVTi	K10 PVDiaN	H5C20 PVTi	P25 PVTi	P25 PVGO
Steel								
Free Machining Steel/ Mild Steel	▽ ▽	150 - 200 400 - 400	150 - 350	150 - 350			100 - 300 150 - 350	
Normal Tool Steel/ Steel Castings	▽ ▽	150 - 250 200 - 350	150 - 350	150 - 300			100 - 250 150 - 300	
Tool Steel and Steel Castings, both difficult to machine	▽ ▽	120 - 200 150 - 300	150 - 250	150 - 250		80 - 180 80 - 180	150 - 180 150 - 250	
High-temperature Alloys								
High-temperature Alloys	▽ ▽		35 - 50			20 - 50 35 - 50		20 - 50 30 - 80
Titanium Alloys	▽ ▽		35 - 50	35 - 50 35 - 50		20 - 50 35 - 50		40 - 80 40 - 100
Stainless Steel								
(all kinds)	▽ ▽	100 - 200	100 - 250	120 - 180				80 - 200 80 - 230
Cast Iron								
Grey Cast Iron	▽ ▽	150 - 200 200 - 350	150 - 250	150 - 200 150 - 250				
Spheroidal Graphite	▽ ▽	150 - 200 200 - 350	150 - 250	150 - 250			150 - 250	
Tempered Castings	▽ ▽	100 - 150 200 - 350	150 - 200	150 - 200				
NE-Materials								
Aluminium	▽ ▽		100 - 800	100 - 800 100 - 800	100 - 800 100 - 800			
Copper	▽ ▽		100 - 400	100 - 400 100 - 400	100 - 400 100 - 400			
Graphite	▽ ▽	200 - 800 200 - 800	200 - 800	200 - 800 200 - 800	200 - 800 200 - 800			
Plastics	▽ ▽	200 - 800 200 - 800	200 - 800	200 - 800 200 - 800	200 - 800 200 - 800			
Hardened Steel								
up to 48HRC	▽ ▽	150 - 250 150 - 250	150 - 250	150 - 250 150 - 250				
up to 55HRC	▽ ▽	100 - 180 100 - 180	100 - 180	100 - 180 100 - 180				
up to 65HRC	▽ ▽	35 - 150 35 - 150	35 - 150	35 - 150 35 - 150				

These speed and feed values are approximate. Customer-specific factors such as input power, machine stability, tool overhang, etc. are not taken into account. In order to guarantee optimum and economic cutting conditions with our tools, please ask our office or one of our application engineers.
For more detailed recommendations regarding operation data (including the tool level), please take a look at our current CD-ROM catalogue.



CUTTING MATERIAL AND COATING

P40 PVGO	P40 PVTi	P40 PVSR PVML	P40 PVGM	M40 PVST	CBN C	CBN S	Application	Material
								Steel
160 - 250	100 - 250	100 - 300 150 - 350	140 - 180				▽ ▽ ▽	Free Machining Steel/ Mild Steel
100 - 200	100 - 200	100 - 250 150 - 300	140 - 180				▽ ▽ ▽	Normal Tool Steel/ Steel Castings
100 - 150	100 - 150	150 - 180 150 - 250	90 - 140				▽ ▽ ▽	Tool Steel and Steel Castings, both difficult to machine
								High-temperature Alloys
			20 - 50 20 - 50	20 - 50 30 - 80			▽ ▽ ▽	High-temperature Alloys
			50 - 110 50 - 110	40 - 80 60 - 120			▽ ▽ ▽	Titanium Alloys
								Stainless Steel
			70 - 180 100 - 200	80 - 180 110 - 250			▽ ▽ ▽	(all kinds)
								Cast Iron
130 - 180 150 - 200		160 - 220 160 - 220			500 - 1000		▽ ▽ ▽	Grey Cast Iron
130 - 180 150 - 200		160 - 220 160 - 220			500 - 1000		▽ ▽ ▽	Spheroidal Graphite
100 - 160 120 - 180		160 - 220 160 - 220			500 - 1000		▽ ▽ ▽	Tempered Castings
								NE-Materials
							▽ ▽ ▽	Aluminium
							▽ ▽ ▽	Copper
							▽ ▽ ▽	Graphite
							▽ ▽ ▽	Plastics
								Hardened Steel
		80 - 150				400 - 1000	▽ ▽ ▽	up to 48HRC
						400 - 1000	▽ ▽ ▽	up to 55HRC
						400 - 800	▽ ▽ ▽	up to 65HRC



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FEED PER TOOTH/DEPTH OF CUT ROUND INSERTS

Feed per tooth (f_z), depth of cut (a_p)

			CUTTING MATERIAL AND COATING				
Size of Insert	Material	f_z/a_p	HSC05 PVTi PVFN	K10 PVTi	HSC20 PVTi	P25 PVGO	P40 PVTi
	Steel						
	Ø 5 x 1,50	 f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 0,3		0,1 - 0,2 0,1 - 0,3		
	Ø 7 x 1,99	 f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 0,5	0,1 - 0,2 0,1 - 0,2	0,1 - 0,3 0,1 - 0,5		0,1 - 0,3 0,1 - 0,5
	Ø 7 x 2,38	 f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 0,7		0,1 - 0,3 0,1 - 0,7		0,2 - 0,5 0,1 - 0,75
	Ø 10 x 3,18	 f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 1,0	0,15 - 0,3 0,1 - 0,3	0,15 - 0,3 0,1 - 1,0		0,2 - 0,6 0,2 - 1,5
	Ø 12 x 3,97	 f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 1,5	0,15 - 0,3 0,1 - 1,3	0,15 - 0,4 0,1 - 1,5		0,2 - 0,7 0,2 - 2,0
	Ø 16 x 4,76	 f_z (mm) a_p (mm)	0,2 - 0,3 0,2 - 1,5	0,2 - 0,3 0,2 - 1,5	0,2 - 0,5 0,2 - 3,0		0,2 - 0,9 0,2 - 4,0
	Ø 20 x 6,00	 f_z (mm) a_p (mm)	0,25 - 0,4 0,2 - 2,0	0,25 - 0,4 0,2 - 2,0	0,25 - 0,6 0,2 - 4,0		0,25 - 1,2 0,2 - 5,0
	High-temperature Alloys						
Ø 5 x 1,5	 f_z (mm) a_p (mm)						
Ø 7 x 1,99	 f_z (mm) a_p (mm)		0,1 - 0,2 0,1 - 0,5				
Ø 7 x 2,38	 f_z (mm) a_p (mm)		0,1 - 0,2 0,1 - 0,75		0,1 - 0,3 0,2 - 0,7		
Ø 10 x 3,18	 f_z (mm) a_p (mm)		0,1 - 0,2 0,1 - 1,0		0,1 - 0,4 0,2 - 1,0		
Ø 12 x 3,97	 f_z (mm) a_p (mm)		0,1 - 0,25 0,1 - 1,0		0,15 - 0,5 0,3 - 1,5		
Ø 16 x 4,76	 f_z (mm) a_p (mm)		0,15 - 0,3 0,2 - 2,5		0,15 - 0,5 0,3 - 2,0		
Ø 20 x 6,00	 f_z (mm) a_p (mm)		0,2 - 0,4 0,2 - 3,0				
Stainless Steel							
Ø 5 x 1,50	 f_z (mm) a_p (mm)		0,1 - 0,15 0,1 - 0,15				
Ø 7 x 1,99	 f_z (mm) a_p (mm)		0,1 - 0,2 0,1 - 0,2	0,1 - 0,2 0,1 - 0,2			
Ø 7 x 2,38	 f_z (mm) a_p (mm)		0,1 - 0,2 0,1 - 0,2	0,1 - 0,2 0,1 - 0,2		0,1 - 0,5 0,3 - 0,7	
Ø 10 x 3,18	 f_z (mm) a_p (mm)		0,15 - 0,3 0,1 - 0,3	0,15 - 0,3 0,1 - 0,3		0,15 - 0,6 0,4 - 1,0	
Ø 12 x 3,97	 f_z (mm) a_p (mm)		0,15 - 0,3 0,1 - 0,3	0,15 - 0,3 0,1 - 0,3		0,2 - 0,8 0,5 - 2,0	
Ø 16 x 4,76	 f_z (mm) a_p (mm)		0,15 - 0,3 0,1 - 0,3	0,15 - 0,3 0,1 - 0,3		0,3 - 1,0 0,6 - 3,0	
Ø 20 x 6,00	 f_z (mm) a_p (mm)			0,15 - 0,3 0,1 - 0,4			

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CUTTING MATERIAL AND COATING						Material	
P40 PVGO	P40 PV5R PVML	P40 PVGM	CBN C	CBN S	f_z/a_p		
Steel							
					f_z (mm) a_p (mm)		Ø 5 x 1,50
	0,1 - 0,3 0,1 - 0,7	0,1 - 0,3 0,1 - 0,7			f_z (mm) a_p (mm)		Ø 7 x 1,99
	0,2 - 0,5 0,1 - 0,75	0,1 - 0,3 0,1 - 0,7			f_z (mm) a_p (mm)		Ø 7 x 2,38
0,1 - 0,7 0,2 - 1,5	0,2 - 0,7 0,2 - 1,5	0,1 - 0,3 0,1 - 1,0			f_z (mm) a_p (mm)		Ø 10 x 3,18
0,2 - 0,8 0,2 - 2,0	0,2 - 0,8 0,2 - 2,0	0,1 - 0,4 0,1 - 1,5			f_z (mm) a_p (mm)		Ø 12 x 3,97
0,3 - 1,0 0, - 3,0	0,25 - 1,0 0,2 - 3,0	0,2 - 0,5 0,2 - 3,0			f_z (mm) a_p (mm)		Ø 16 x 4,76
	0,25 - 1,2 0,2 - 5,0				f_z (mm) a_p (mm)		Ø 20 x 6,00
High-temperature Alloys							
					f_z (mm) a_p (mm)		Ø 5 x 1,50
		0,1 - 0,2 0,1 - 0,5			f_z (mm) a_p (mm)		Ø 7 x 1,99
		0,1 - 0,2 0,1 - 0,75			f_z (mm) a_p (mm)		Ø 7 x 2,38
		0,1 - 0,2 0,1 - 1,0			f_z (mm) a_p (mm)		Ø 10 x 3,18
		0,1 - 0,25 0,1 - 1,0			f_z (mm) a_p (mm)		Ø 12 x 3,97
		0,15 - 0,3 0,2 - 2,5			f_z (mm) a_p (mm)		Ø 16 x 4,76
					f_z (mm) a_p (mm)		Ø 20 x 6,00
Stainless Steel							
					f_z (mm) a_p (mm)		Ø 5 x 1,50
		0,1 - 0,3 0,1 - 0,5			f_z (mm) a_p (mm)		Ø 7 x 1,99
					f_z (mm) a_p (mm)		Ø 7 x 2,38
		0,1 - 0,3 0,1 - 1,0			f_z (mm) a_p (mm)		Ø 10 x 3,18
		0,1 - 0,4 0,1 - 1,5			f_z (mm) a_p (mm)		Ø 12 x 3,97
		0,2 - 0,5 0,2 - 3,0			f_z (mm) a_p (mm)		Ø 16 x 4,76
					f_z (mm) a_p (mm)		Ø 20 x 6,00

Size of Insert

FEED PER TOOTH/DEPTH OF CUT ROUND INSERTS (continued)

Feed per tooth (f_z), depth of cut (a_p)

Material		CUTTING MATERIAL AND COATING						
		f_z/a_p	HSC05 PVTi PVFN	K10 PVTi	P25 PVTi	P25 PVGO	P40 PVTi	
Size of Insert	Steel							
	Ø 5 x 1,50		f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3		0,1 - 0,2 0,1 - 0,3		
	Ø 7 x 1,99		f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 0,5		0,1 - 0,3 0,1 - 0,5		
	Ø 7 x 2,38		f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 0,7	0,1 - 0,3 0,1 - 1,0	0,1 - 0,3 0,1 - 0,7		
	Ø 10 x 3,18		f_z (mm) a_p (mm)	0,15 - 0,3 0,1 - 1,0	0,15 - 0,3 0,1 - 1,5	0,15 - 0,3 0,1 - 1,0		
	Ø 12 x 3,97		f_z (mm) a_p (mm)	0,15 - 0,4 0,1 - 1,5	0,15 - 0,4 0,1 - 2,0	0,15 - 0,4 0,1 - 1,5		
	Ø 16 x 4,76		f_z (mm) a_p (mm)	0,2 - 0,5 0,2 - 3,0	0,2 - 0,5 0,1 - 3,0	0,2 - 0,5 0,2 - 3,0		
	Ø 20 x 6,00		f_z (mm) a_p (mm)	0,25 - 0,6 0,2 - 4,0	0,25 - 0,6 0,2 - 4,0	0,25 - 0,6 0,2 - 4,0		
	High-temperature Alloys							
	Ø 5 x 1,5		f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3				
	Ø 7 x 1,99		f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 0,7	0,1 - 0,3 0,1 - 0,7			
	Ø 7 x 2,38		f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 1,0	0,1 - 0,3 0,1 - 1,0			
	Ø 10 x 3,18		f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 1,5	0,1 - 0,3 0,1 - 1,5			
	Ø 12 x 3,97		f_z (mm) a_p (mm)	0,1 - 0,4 0,1 - 2,0	0,1 - 0,4 0,1 - 2,0			
	Ø 16 x 4,76		f_z (mm) a_p (mm)	0,2 - 0,5 0,2 - 4,0	0,2 - 0,5 0,2 - 4,0			
	Ø 20 x 6,00		f_z (mm) a_p (mm)	0,25 - 0,6 0,2 - 5,0	0,25 - 0,6 0,2 - 5,0			
	Stainless Steel							
	Ø 5 x 1,50		f_z (mm) a_p (mm)	0,1 - 0,15 0,1 - 0,2				
	Ø 7 x 1,99		f_z (mm) a_p (mm)	0,1 - 0,15 0,1 - 0,2	0,1 - 0,15 0,1 - 0,2			
	Ø 7 x 2,38		f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3			
	Ø 10 x 3,18		f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,5	0,1 - 0,2 0,1 - 0,5			
	Ø 12 x 3,97		f_z (mm) a_p (mm)	0,1 - 0,25 0,1 - 0,7	0,1 - 0,25 0,1 - 0,7			
	Ø 16 x 4,76		f_z (mm) a_p (mm)	0,15 - 0,3 0,2 - 1,0	0,15 - 0,3 0,2 - 1,0			
	Ø 20 x 6,00		f_z (mm) a_p (mm)	0,2 - 0,4 0,2 - 1,0	0,2 - 0,4 0,2 - 1,0			

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CUTTING MATERIAL AND COATING							
P40 PVGO	P40 PVSR PVML	P40 PVGM	CBN C	CBN S	f_z/a_p	Material	
							Steel
					f_z (mm) a_p (mm)		Ø 5 x 1,5
	0,1 - 0,3 0,1 - 0,5				f_z (mm) a_p (mm)		Ø 7 x 1,99
	0,1 - 0,3 0,1 - 0,7				f_z (mm) a_p (mm)		Ø 7 x 2,38
0,1 - 0,3 0,1 - 1,0	0,1 - 0,3 0,1 - 1,0		0,1 - 0,3 0,1 - 0,5		f_z (mm) a_p (mm)		Ø 10 x 3,18
0,1 - 0,4 0,2 - 1,5	0,1 - 0,4 0,1 - 1,5				f_z (mm) a_p (mm)		Ø 12 x 3,97
0,2 - 0,5 0,2 - 2,0	0,2 - 0,5 0,2 - 3,0				f_z (mm) a_p (mm)		Ø 16 x 4,76
	0,25 - 0,6 0,2 - 5,0				f_z (mm) a_p (mm)		Ø 20 x 6,00
							High-temperature Alloys
					f_z (mm) a_p (mm)		Ø 5 x 1,5
					f_z (mm) a_p (mm)		Ø 7 x 1,99
					f_z (mm) a_p (mm)		Ø 7 x 2,38
					f_z (mm) a_p (mm)		Ø 10 x 3,18
					f_z (mm) a_p (mm)		Ø 12 x 3,97
					f_z (mm) a_p (mm)		Ø 16 x 4,76
					f_z (mm) a_p (mm)		Ø 20 x 6,00
							Stainless Steel
					f_z (mm) a_p (mm)		Ø 5 x 1,50
					f_z (mm) a_p (mm)		Ø 7 x 1,99
	0,1 - 0,2 0,1 - 0,3			0,1 - 0,3 0,1 - 0,4	f_z (mm) a_p (mm)		Ø 7 x 2,38
	0,1 - 0,2 0,1 - 0,3			0,1 - 0,3 0,1 - 0,5	f_z (mm) a_p (mm)		Ø 10 x 3,18
	0,1 - 0,2 0,1 - 0,5				f_z (mm) a_p (mm)		Ø 12 x 3,97
	0,1 - 0,25 0,1 - 0,7				f_z (mm) a_p (mm)		Ø 16 x 4,76
	0,15 - 0,3 0,2 - 1,5				f_z (mm) a_p (mm)		Ø 20 x 6,00

Size of Insert

Size of Insert

FEED PER TOOTH/DEPTH OF CUT BALL NOSE CUTTER BODIES

Feed per tooth (f_z), depth of cut (a_p)

		CUTTING MATERIAL AND COATING							
Size of Insert	Material	Ball Nose		Toric	f_z/a_p	K10 PVTi	HSC05 PVTi PVFN	K10 PVTi	
	Steel								
	Ø 8				r 3	f_z (mm) a_p (mm)	0,08 - 0,16 0,1 - 0,3		0,08 - 0,16 0,1 - 0,3
	Ø 10				r 4	f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3
	Ø 12				r 5	f_z (mm) a_p (mm)	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3
	Ø 16				r 7	f_z (mm) a_p (mm)	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5
	Ø 20					f_z (mm) a_p (mm)	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5
	High-temperature Alloys								
	Ø 8				r 3	f_z (mm) a_p (mm)	0,08 - 0,16 0,1 - 0,3		0,08 - 0,16 0,1 - 0,3
	Ø 10				r 4	f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3
	Ø 12				r 5	f_z (mm) a_p (mm)	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3
	Ø 16				r 7	f_z (mm) a_p (mm)	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5
	Ø 20					f_z (mm) a_p (mm)	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5
	Stainless Steel								
	Ø 8				r 3	f_z (mm) a_p (mm)	0,08 - 0,16 0,1 - 0,3		0,08 - 0,16 0,1 - 0,3
	Ø 10				r 4	f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3
	Ø 12				r 5	f_z (mm) a_p (mm)	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3
	Ø 16				r 7	f_z (mm) a_p (mm)	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5
	Ø 20					f_z (mm) a_p (mm)	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5
	Cast Iron								
	Ø 8				r 3	f_z (mm) a_p (mm)	0,08 - 0,16 0,1 - 0,3		0,08 - 0,16 0,1 - 0,3
	Ø 10				r 4	f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3
	Ø 12				r 5	f_z (mm) a_p (mm)	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3
	Ø 16				r 7	f_z (mm) a_p (mm)	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5
	Ø 20					f_z (mm) a_p (mm)	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5

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continued:

		CUTTING MATERIAL AND COATING							
Size of Insert	Material	Ball Nose		Toric	f_z/a_p	HSC05 PVTi PVTiH	K05 PVTi	P40 PVTi	
	Non-ferrous Materials								
	Ø 8				r 3	f_z (mm) a_p (mm)	0,08 - 0,16 0,1 - 0,3		0,08 - 0,16 0,1 - 0,3
	Ø 10				r 4	f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3
	Ø 12				r 5	f_z (mm) a_p (mm)	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3
	Ø 16				r 7	f_z (mm) a_p (mm)	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5
	Ø 20					f_z (mm) a_p (mm)	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5
	Hardened Steel								
	Ø 8				r 3	f_z (mm) a_p (mm)	0,08 - 0,16 0,1 - 0,3		0,08 - 0,16 0,1 - 0,3
	Ø 10				r 4	f_z (mm) a_p (mm)	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3	0,1 - 0,2 0,1 - 0,3
	Ø 12				r 5	f_z (mm) a_p (mm)	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3	0,12 - 0,24 0,1 - 0,3
	Ø 16				r 7	f_z (mm) a_p (mm)	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5	0,16 - 0,32 0,1 - 0,5
	Ø 20					f_z (mm) a_p (mm)	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5	0,2 - 0,4 0,1 - 0,5

Ball nose indexable inserts for WaveWorx®

		CUTTING MATERIAL AND COATING			
Size of Insert	Material				
		l	r	f_z/a_p	P25 PVML
	Steel				
		15,6	8	f_z (mm) a_p (mm)	0,1 - 0,6 0,6 - 3,0
		19,6	10	f_z (mm) a_p (mm)	0,1 - 0,6 0,5 - 4,0
		24,5	12,5	f_z (mm) a_p (mm)	0,2 - 0,8 0,5 - 4,0
	30,7	16	f_z (mm) a_p (mm)	0,2 - 0,8 0,5 - 4,0	

FEED PER TOOTH/DEPTH OF CUT BALL NOSE CUTTER BODIES

Feed per tooth (f_z), depth of cut (a_p)

Indexable V-Inserts for Non-ferrous Materials

CUTTING MATERIAL AND COATING									
Size of Insert						K10 polished / PVTi / PVDiaN			
	Material					15 - 20	25 - 42	52 - 66	80 - 125
		r	l	f_z/a_p					
	Non-ferrous Materials								
	VDGT 11 T2 10		1	11	f_z (mm) a_p (mm)	0,05 - 0,2 0,1 - 2,0	0,3 - 0,5 0,1 - 2,5		
	VCGT 22 05 30		3	16	f_z (mm) a_p (mm)		0,1 - 0,6 0,1 - 4,0	0,1 - 0,6 0,1 - 4,0	0,1 - 0,6 0,1 - 4,0

Trigaworx®

CUTTING MATERIAL AND COATING								
Size of Insert	Material			r	f_z/a_p	HSC05 PVTi	P25 PVTi	P40 PVTi
	Steel							
	WDHX 07 02 05		7	f_z (mm) a_p (mm)	0,3 - 1,5 0,3 - 0,6			0,3 - 1,5 0,3 - 0,6
	WDHX 10 03 10		11,3	f_z (mm) a_p (mm)	0,5 - 2,0 0,3 - 1,0		0,5 - 2,0 0,3 - 1,0	0,5 - 2,0 0,3 - 1,0
	WDHX 14 04 20		14,3	f_z (mm) a_p (mm)				0,5 - 3,0 0,3 - 1,2

Indexable Rhombic Inserts

					CUTTING MATERIAL AND COATING	
Size of Insert	Material				XDHW / XDHT 0602	
		r	l	f_z/a_p	HSC05 PVTi	K10 poliort PVTi PVDiaN
	Steel		6,5	f_z (mm) a_p (mm)	0,1 - 0,3 0,15 - 1,0	0,1 - 0,3 0,15 - 1,0
	High-temperature Alloys		6,5	f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 1,0	0,1 - 0,3 0,1 - 1,0
	Stainless Steel		6,5	f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 1,0	0,1 - 0,3 0,1 - 1,0
	Cast Iron		6,5	f_z (mm) a_p (mm)	0,1 - 0,3 0,1 - 1,0	0,1 - 0,3 0,1 - 1,0
	Non-ferrous Materials		6,5	f_z (mm) a_p (mm)	0,1 - 0,35 0,1 - 1,0	0,1 - 0,35 0,1 - 1,0
	Hardened Steel		6,5	f_z (mm) a_p (mm)	0,1 - 0,25 0,1 - 0,25	0,1 - 0,25 0,1 - 0,25

These speed and feed values are approximate. Customer-specific factors such as input power, machine stability, tool overhang, etc. are not taken into account. In order to guarantee optimum and economic cutting conditions with our tools, please ask our office or one of our application engineers. For more detailed recommendations regarding operation data (including the tool level), please take a look at our current CD-ROM catalogue.

FEED PER TOOTH/DEPTH OF CUT

Feed per tooth (f_z), depth of cut (a_p)

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Rectangular Inserts

CUTTING MATERIAL AND COATING							
Material		r	l	f_z/a_p	HSC 05 PVTi	P25 PVTi	PA0 PVTi
ADEW 09 02 08 TR		0,8	9,52	f_z (mm) a_p (mm)	0,1 - 0,25 0,1 - 2,0	0,1 - 0,25 0,1 - 2,0	0,1 - 0,25 0,1 - 2,0
LDLX 06T2 04		0,4	8	f_z (mm) a_p (mm)	0,1 - 0,25 0,1 - 2,0	0,1 - 0,25 0,1 - 2,0	0,1 - 0,25 0,1 - 2,0
CDHT 09 03 08		0,8	9,3	f_z (mm) a_p (mm)	0,1 - 0,25 0,1 - 2,0	0,1 - 0,25 0,1 - 2,0	

Baseworx®

CUTTING MATERIAL AND COATING					
Material		l	f_z/a_p	K10 polished	PA0 PVGO
OFET 05 T3		12,77	f_z (mm) a_p (mm)	0,8 - 0,3 0,1 - 3,5	
OFMW 05 T3		12,77	f_z (mm) a_p (mm)		0,1 - 0,5 0,2 - 3,0

Mirroworx®

CUTTING MATERIAL AND COATING					
Material		l	f_z/a_p	TEHX 16T3 ZF	
Size of Insert				HSC5 PVTi	
Steel		16,6	f_z (mm) a_p (mm)	0,5 - 2,0 0,05 - 0,2	
Cast Iron		16,6	f_z (mm) a_p (mm)	0,5 - 2,0 0,05 - 0,2	
Stainless Steel		16,6	f_z (mm) a_p (mm)	0,2 - 1,0 0,05 - 0,1	

Indexable Square Inserts

CUTTING MATERIAL AND COATING					
Material		l	f_z/a_p	P25 PVTi Cement	
SEEW 09 T3 AE		9,52	f_z (mm) a_p (mm)	0,1 - 0,35 0,1 - 3,0	

FEED PER TOOTH/DEPTH OF CUT

Feed per tooth (f_z), depth of cut (a_p)

Quadworx® S

						CUTTING MATERIAL AND COATING			
						SDMX 070205 SN/SDMT 070205 SN			
Size of Insert	Material		r	l	f_z/a_p	HSC 05 PVTi	P40 PVTi	M40 PVST	
	Steel		0,5	7	f_z (mm) a_p (mm)		0,3 - 1,5 0,2 - 0,7		
	High-temperature Alloys		0,5	7	f_z (mm) a_p (mm)			0,2 - 0,8 0,1 - 0,5	
	Stainless Steel		0,5	7	f_z (mm) a_p (mm)			0,2 - 1,0 0,1 - 0,5	
	Cast Iron		0,5	7	f_z (mm) a_p (mm)	0,3 - 1,5 0,2 - 0,7			
	Hardened Steel		0,5	7	f_z (mm) a_p (mm)	0,3 - 1,0 0,2 - 0,5			

Quadworx® M

						CUTTING MATERIAL AND COATING			
						SDMX 09T307 SN/ SDHX 09T307 SN/ SDMT 09T307 SN			
Size of Insert	Material		r	l	f_z/a_p	K10 PVTi	P40 PVTi P40 PVGO	P25 PVTi	M40 PVST
	Steel		0,7	9	f_z (mm) a_p (mm)		0,5 - 2,0 0,3 - 1,0	0,5 - 2,0 0,3 - 1,0	
	High-temperature Alloys		0,7	9	f_z (mm) a_p (mm)				0,3 - 0,9 0,2 - 0,7
	Stainless Steel		0,7	9	f_z (mm) a_p (mm)				0,3 - 1,2 0,2 - 0,9
	Cast Iron		0,7	9	f_z (mm) a_p (mm)	0,5 - 2,2 0,2 - 1,2			
	Hardened Steel		0,7	9	f_z (mm) a_p (mm)	0,2 - 1,0 0,2 - 0,5			

Quadworx® L

						CUTTING MATERIAL AND COATING			
						SDMX 100510 SN/ SDHX 100510 SN/ SDMT 100510 SN			
Size of Insert	Material		r	l	f_z/a_p	K10 PVTi	P40 PVTi P40 PVGO	P25 PVTi	M40 PVST
	Steel		1	10	f_z (mm) a_p (mm)		0,3 - 2,5 0,3 - 1,5	0,3 - 2,5 0,3 - 1,5	
	High-temperature Alloys		1	10	f_z (mm) a_p (mm)				0,35 - 1,0 0,25 - 0,9
	Stainless Steel		1	10	f_z (mm) a_p (mm)				0,35 - 1,5 0,25 - 1,5
	Cast Iron		1	10	f_z (mm) a_p (mm)	0,3 - 2,5 0,3 - 1,7			
	Hardened Steel		1	10	f_z (mm) a_p (mm)	0,3 - 1,5 0,3 - 0,8			

FEED PER TOOTH/DEPTH OF CUT

Feed per tooth (f_z), depth of cut (a_p)

Slotworx® S

Cutting Material and Coating								
XOMX 060208 R								
Material		r	l	f_z/a_p	P40 PVML			
Steel		0,8	6,94	f_z (mm) a_p (mm)	0,02 - 0,17 0,1 - 2,5			
High-temperature Alloys		0,8	6,94	f_z (mm) a_p (mm)	0,02 - 0,10 0,1 - 1,7			
Stainless Steel		0,8	6,94	f_z (mm) a_p (mm)	0,02 - 0,14 0,1 - 2,5			

Slotworx® M

Cutting Material and Coating								
XDHT 10T310/XDHT 10T310/XDHT 10T330/XDHT 10T340								
Material		r	l	f_z/a_p	HSC 05 PVFN	K10 polished	K10 PVTi/ PVDiaN	P40 PVGO M40 PVST
Steel		1	10	f_z (mm) a_p (mm)				0,05 - 0,35 0,1 - 9
High-temperature Alloys		1	10	f_z (mm) a_p (mm)				0,08 - 0,35 0,1 - 9
Stainless Steel		1	10	f_z (mm) a_p (mm)				0,08 - 0,35 0,1 - 9
Cast Iron		1	10	f_z (mm) a_p (mm)				0,08 - 0,4 0,1 - 9
Non - ferrous Materials		1 2 3 4	10	f_z (mm) a_p (mm)	0,08 - 0,35 0,1 - 9	0,08 - 0,35 0,1 - 9		
Hardened Steel		1	10	f_z (mm) a_p (mm)	0,08 - 0,25 0,1 - 5			

Slotworx® L

Cutting Material and Coating								
XDHT 10T310/XDHT 10T310/ XDHT 10T330/XDHT 10T340								
Material		r	l	f_z/a_p	K10 polished	K10 PVTi/ PVDiaN	P40 PVGO	M40 PVST
Steel		1	15	f_z (mm) a_p (mm)			0,1 - 0,5 0,2 - 14	
High-temperature Alloys		1	15	f_z (mm) a_p (mm)				0,08 - 0,3 0,1 - 14
Stainless Steel		1	15	f_z (mm) a_p (mm)				0,08 - 0,5 0,1 - 14
Cast Iron		1	15	f_z (mm) a_p (mm)			0,1 - 0,5 0,2 - 14	
Non - ferrous Materials		1 2 3 4	15	f_z (mm) a_p (mm)	0,08 - 0,35 0,1 - 14			

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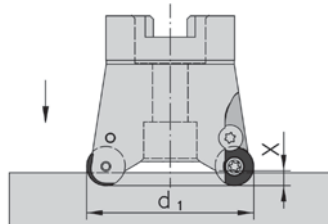
Operation Data

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EXTENDED OPERATION DATA

Milling cutters with round inserts

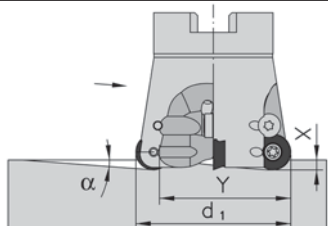
axial plunging into solid block



x maximum plunge depth
f_z see operation data table, but reduce value to 30%

	05	07	10	12	16	20
Cutter diam. d ₁ mm	X max. mm	X max. mm	X max. mm	X max. mm	X max. mm	X max. mm
8 - 160	1	1,2	2,5	3	4	5

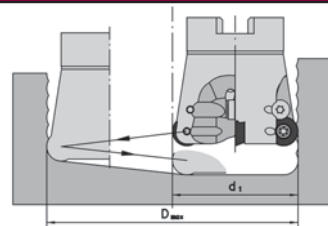
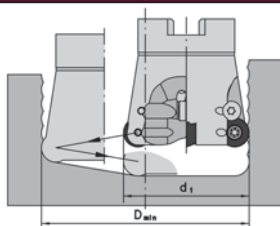
incline plunge milling



y minimum travel
x maximum plunge depth
a_p/f_z see operation data table

	05				07		10		12		16		20	
														
Cutter diam. d ₁ mm	α°	y mm	α°	y mm	α°	y mm	α°	y mm	α°	y mm	α°	y mm		
8	< 26,5	2	-	-	-	-	-	-	-	-	-	-		
10	-	-	-	-	-	-	-	-	-	-	-	-		
12	< 14,0	4	-	-	-	-	-	-	-	-	-	-		
14	< 9,5	6	-	-	-	-	-	-	-	-	-	-		
15	< 8,1	7	< 26,5	2	-	-	-	-	-	-	-	-		
16	< 7,1	8	< 14,0	4	-	-	-	-	-	-	-	-		
18	< 5,7	10	< 11,3	6	-	-	-	-	-	-	-	-		
20	< 4,7	12	< 8,5	8	-	-	-	-	-	-	-	-		
22	-	-	-	-	-	-	-	-	-	-	-	-		
24	-	-	-	-	-	-	-	-	-	-	-	-		
25	-	-	< 5,3	13	< 19,7	7								
30	-	-	< 3,8	18	< 11,7	12								
32	-	-	-	-	-	-	-	-	-	-	-	-		
35	-	-	< 3,0	23	< 8,4	17	< 13,0	13	< 38,7	5	-	-		
40	-	-	-	-	-	-	-	-	-	-	-	-		
42	-	-	< 2,3	30	< 5,9	24	< 6,5	20	-	-	-	-		
50	-	-	-	-	-	-	-	-	-	-	-	-		
52	-	-	-	-	< 4,2	34	< 5,7	30	< 10,3	22	-	-		
66	-	-	-	-	-	-	< 3,9	44	< 6,4	36	< 10,1	28		
80	-	-	-	-	-	-	< 3,0	58	< 4,6	50	< 6,8	42		
100	-	-	-	-	-	-	-	-	< 3,3	70	< 4,6	62		
125	-	-	-	-	-	-	-	-	< 2,4	95	< 3,3	87		
160	-	-	-	-	-	-	-	-	< 1,5	130	< 2,3	122		

circular milling into solid block


 a_p/f_z see operation data table

 D_{min} minimum bore diameter depending on cutter-diameter

 D_{max} maximum bore diameter depending on cutter-diameter

	05		07		10		12		16		20	
Cutter diam. d_1 mm	D_{min} mm	D_{max} mm	D_{min} mm	D_{max} mm	D_{min} mm	D_{max} mm	D_{min} mm	D_{max} mm	D_{min} mm	D_{max} mm	D_{min} mm	D_{max} mm
8	10	16	-	-	-	-	-	-	-	-	-	-
10	12	20	-	-	-	-	-	-	-	-	-	-
12	16	24	14	24	-	-	-	-	-	-	-	-
14	20	28	16	28	-	-	-	-	-	-	-	-
15	22	30	17	30	-	-	-	-	-	-	-	-
16	24	32	20	32	-	-	-	-	-	-	-	-
18	28	36	24	36	20	36	-	-	-	-	-	-
20	32	40	28	40	22	40	-	-	-	-	-	-
22	-	-	-	-	-	-	24	44	-	-	-	-
24	-	-	-	-	-	-	26	48	-	-	-	-
25	-	-	38	50	32	50	-	-	-	-	-	-
30	-	-	48	60	42	60	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	34	64	-	-
35	-	-	58	70	52	70	46	70	40	70	-	-
40	-	-	-	-	-	-	-	-	-	-	42	80
42	-	-	72	84	66	84	62	84	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	62	100
52	-	-	-	-	86	104	82	104	74	104	-	-
66	-	-	-	-	-	-	110	132	102	132	94	132
80	-	-	-	-	-	-	136	160	130	1610	122	160
100	-	-	-	-	-	-	-	-	170	200	162	200
125	-	-	-	-	-	-	-	-	220	250	212	250
160	-	-	-	-	-	-	-	-	290	320	282	320

Definitions and Dimensions

 a_p depth of cut in [mm]
 f_z feed per tooth in [mm]

 D_{max} = maximum bore diameter depending on cutter-diameter
 x maximum plunge depth

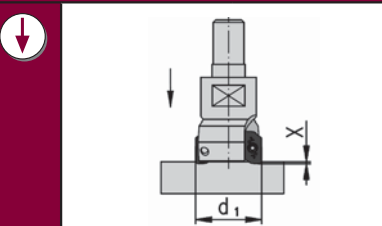
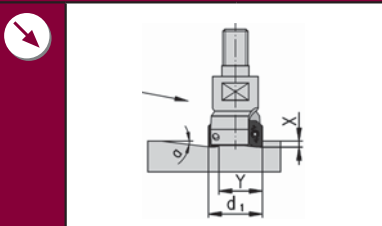
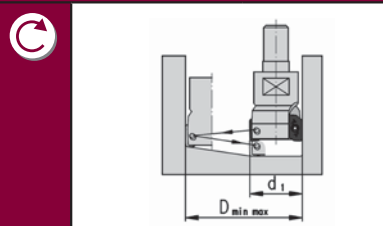
 D_{min} = minimum bore diameter depending on cutter-diameter
 y minimum travel

 α angle of inclination in [°]

EXTENDED OPERATION DATA

Slotworx® - series

Slotworx® S

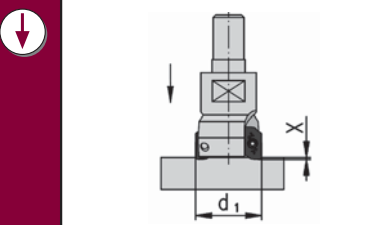
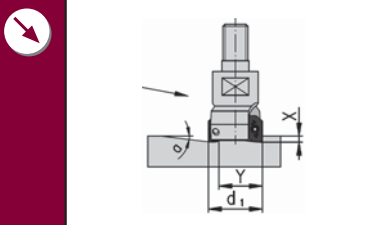
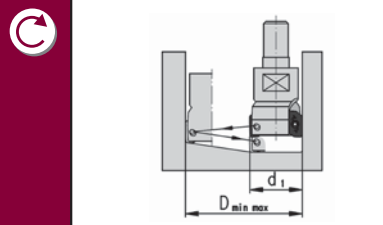
axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d_1 mm	X max. mm	α°	y mm	D_{min} mm	D_{max} mm
10	0,7	10	3	13	20
12	0,7	6,5	5	17	24
16	1,3	4	9	25	32
20	1,3	2,5	13	33	40

x
f_z maximum plunge depth
see operation data table, but reduce value to 30%

y
x
a_p/f_z minimum travel
maximum plunge depth
see operation data table

D_{min} minimum bore diameter depending on
cutter-diameter
 D_{max} maximum bore diameter depending on
cutter-diameter
a_p/f_z see operation data table

Slotworx® M

axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d_1 mm	X max. mm	α°	y mm	D_{min} mm	D_{max} mm
16	2,5	<24,5	5,3	21,3	32
20	2,5	<14,5	9,3	29,3	40
25	2,5	<8	14,3	39,3	50
32	2,5	<5	21,3	53,3	64
42	2,5	<3	31,3	73,3	84
52	2,5	<2,5	41,3	93,3	104

x
f_z maximum plunge depth
see operation data table, but reduce value to 30%

y
x
a_p/f_z minimum travel
maximum plunge depth
see operation data table

D_{min} minimum bore diameter depending on
cutter-diameter
 D_{max} maximum bore diameter depending on
cutter-diameter
a_p/f_z see operation data table

Definitions and Dimensions

a_p depth of cut in (mm)
f_z feed per tooth in [m]

D_{max} = maximum bore diameter depending
on cutter-diameter
x maximum plunge depth

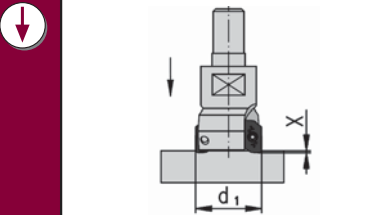
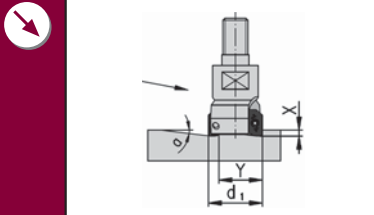
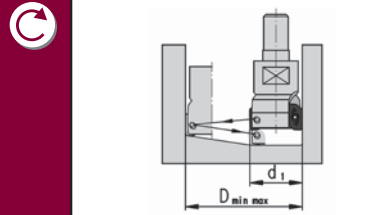
D_{min} = minimum bore diameter depending
on cutter-diameter
y minimum travel

α angle of inclination in [°]
a_p/f_z see operation data table

EXTENDED OPERATION DATA

Slotworx®- series

Slotworx® L

axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d_1 mm	X max. mm	α°	y mm	D_{min} mm	D_{max} mm
25	3	< 8,3	17	42	50
32	3	< 5,9	24	56	64
40	3	< 4,4	32	72	80
42	3	< 4,2	34	76	84
50	3	< 3,3	42	92	100
52	3	< 3,2	44	96	104
63	3	< 2,5	55	118	126
66	3	< 2,4	58	124	132
80	3	< 1,9	72	152	160
100	3	< 1,5	92	192	200

x
f_z maximum plunge depth
see operation data table, but reduce value to 30%

y
x
a_p/f_z minimum travel
maximum plunge depth
see operation data table

D_{min}
D_{max}
a_p/f_z minimum bore diameter depending on
cutter-diameter
maximum bore diameter depending
on cutter-diameter
see operation data table

Definitions and Dimensions

a_p depth of cut in (mm)
f_z feed per tooth in [m]

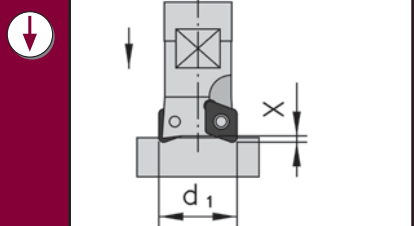
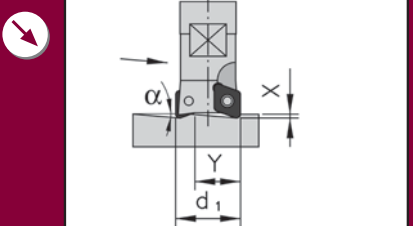
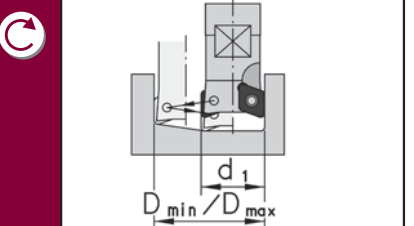
D_{max} = maximum bore diameter depending
on cutter-diameter
x maximum plunge depth

D_{min} = minimum bore diameter depending
on cutter-diameter
y minimum travel

α angle of inclination in [°]
a_p/f_z see operation data table

EXTENDED OPERATION DATA

Indexable rhombic inserts

axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d_1 mm	X max. mm	α°	y mm	D_{min} mm	D_{max} mm
16	1,2	16,7	4	28	32
20	1,2	8,5	8	36	40
25	1,2	5,3	13	46	50
30	1,2	3,8	18	56	60
35	1,2	3,8	23	66	70
42	1,2	2,3	30	80	84

x maximum plunge depth
 f_z see operation data table, but reduce value to 30%

y minimum travel
 x maximum plunge depth
 a_p/f_z see operation data table

D_{min} minimum bore diameter depending on cutter diameter
 D_{max} maximum bore diameter depending on cutter diameter
 a_p/f_z see operation data table

Definitions and Dimensions

a_p depth of cut in [mm]
 f_z feed per tooth in [mm]

D_{max} maximum bore diameter depending on cutter diameter in [mm]
 x maximum plunge depth

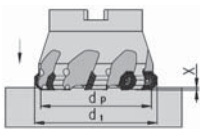
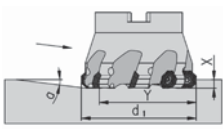
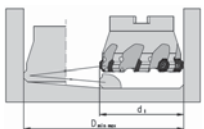
D_{min} minimum bore diameter depending on cutter diameter in [mm]
 y minimum travel in [mm]

α angle of inclination [°]

EXTENDED OPERATION DATA

Baseworx®

OFMW 05T3

axial plunging into solid block			incline plunge milling			circular milling into solid block		
								
								
Cutter diam. d, mm	X max. mm	d _p		α°	y mm		α°	y mm
35	3,5	28,25		16	11,6		46,6	70
40	3,5	32,95		11	16,6		56,6	80
42	3,5	34,85		10	18,6		60,6	84
50	3,5	42,57		7	26,6		76,6	100
52	3,5	45,25		6,5	28,6		80,6	104
63	3,5	55,39		4,5	39,6		102,6	126
66	3,5	57,75		4	42,6		108,6	132
80	3,5	72,20		3	56,6		136,6	160
100	3,5	92,35		2	76,6		176,6	200
125	3,5	117,30		1,5	101,6		226,6	250

x
f_z maximum plunge depth
see operation data table, but reduce value to 30%

y
x
a_p/f_z minimum travel
maximum plunge depth
see operation data table

D_{min}
D_{max}
a_p/f_z minimum bore diameter depending on
cutter-diameter
maximum bore diameter depending on
cutter-diameter
see operation data table

Definitions and Dimensions

a_p depth of cut in (mm)
f_z feed per tooth in [m]

D_{max} = maximum bore diameter depending
on cutter-diameter
x maximum plunge depth

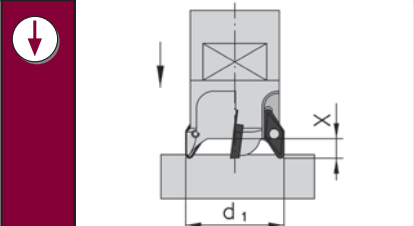
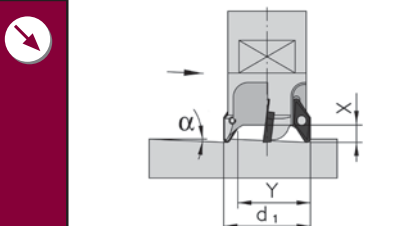
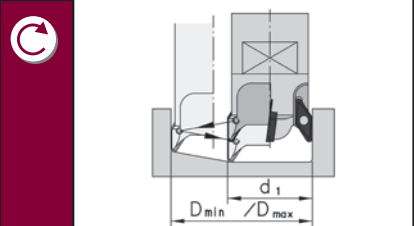
D_{min} = minimum bore diameter depending
on cutter-diameter
y minimum travel

α angle of inclination in [°]
a_p/f_z see operation data table

EXTENDED OPERATION DATA

Indexable inserts for NF materials

VDGT 11

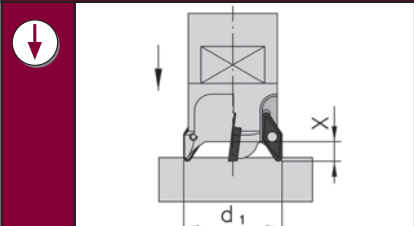
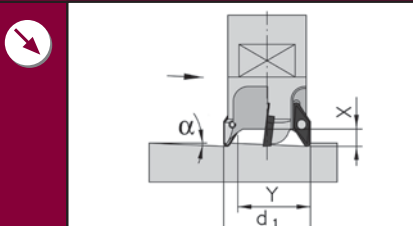
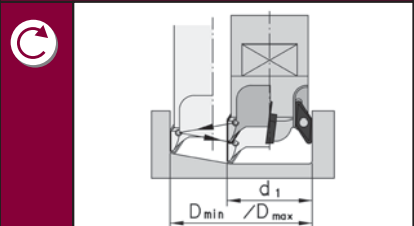
axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d , mm	X max. mm	α°	y mm	D_{min} mm	D_{max} mm
12	4	63,4	2	20	24
15	4	63,4	2	26	30
16	4	45,0	4	28	32
20	4	26,6	8	36	40
25	4	17,1	13	46	50
32	4	11,3	20	60	64
42	4	7,6	30	80	84

x maximum plunge depth
 f_z see operation data table, but reduce value to 30 %

y minimum travel
 x maximum plunge depth
 a_p/f_z see operation data table

D_{min} minimum bore diameter depending on cutter diameter
 D_{max} maximum bore diameter depending on cutter diameter
 a_p/f_z see operation data table

VCGT 22

axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d , mm	X max. mm	α°	y mm	D_{min} mm	D_{max} mm
32	9	42,0	10	42	64
42	9	24,2	20	62	84
52	9	16,7	30	82	104
66	9	11,6	44	110	132
80	9	8,8	58	138	160
100	9	6,6	78	178	200
125	9	5,3	103	228	250

x maximum plunge depth
 f_z see operation data table, but reduce value to 30 %

y minimum travel
 x maximum plunge depth
 a_p/f_z see operation data table

D_{min} minimum bore diameter depending on cutter diameter
 D_{max} maximum bore diameter depending on cutter diameter
 a_p/f_z see operation data table

Definitions and Dimensions

a_p depth of cut in (mm)
 f_z feed per tooth in [m]

D_{max} = maximum bore diameter depending on cutter diameter
 x maximum plunge depth

D_{min} = minimum bore diameter depending on cutter diameter
 y minimum travel

α angle of inclination in [°]
 a_p/f_z see operation data table

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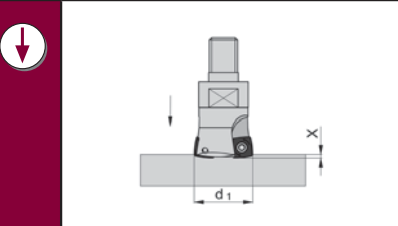
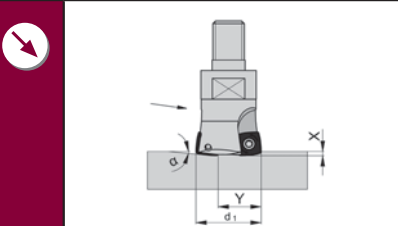
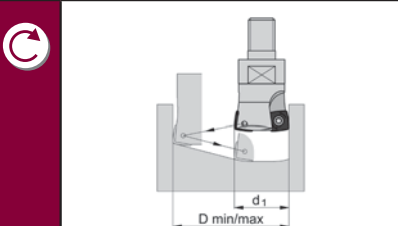
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Quadworx® S

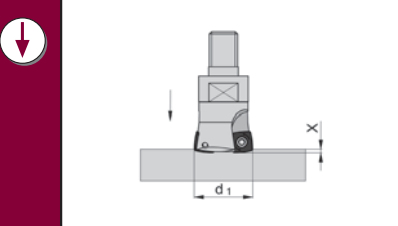
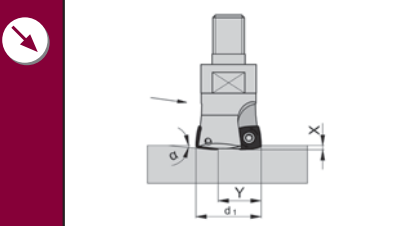
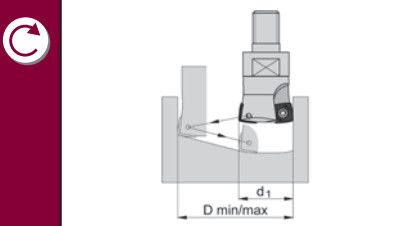
axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d_1 mm	x max. mm	α°	y mm	D_{min} mm	D_{max} mm
14	1	< 13,5	4	18	28
16	1	< 8,8	6	22	32
18	1	< 6,6	8	26	36
20	1	< 5,2	10	30	40
25	1	< 3,3	15	40	50

x
 f_z maximum plunge depth
see operation data table, but reduce value to 30%

y
x
 a_p/f_z minimum travel
maximum plunge depth
see operation data table

D_{min} minimum bore diameter depending on
cutter-diameter
 D_{max} maximum bore diameter depending on
cutter-diameter
 a_p/f_z see operation data table

Quadworx® M

axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d_1 mm	x max. mm	α°	y mm	D_{min} mm	D_{max} mm
22	1,5	< 13,7	6	28,5	44
25	1,5	< 9,2	9	34,5	50
30	1,5	< 5,8	14	44,5	60
35	1,5	< 4,3	19	54,5	70
42	1,5	< 3,1	26	68,5	84
52	1,5	< 2,1	36	88,5	104

x
 f_z maximum plunge depth
see operation data table, but reduce value to 30%

y
x
 a_p/f_z minimum travel
maximum plunge depth
see operation data table

D_{min} minimum bore diameter depending on
cutter-diameter
 D_{max} maximum bore diameter depending on
cutter-diameter
 a_p/f_z see operation data table

Definitions and Dimensions

a_p depth of cut in (mm)
 f_z feed per tooth in [m]

D_{max} maximum bore diameter depending
on cutter-diameter
x maximum plunge depth

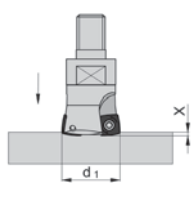
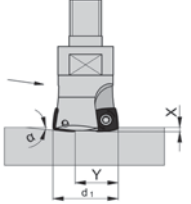
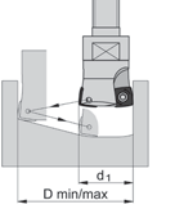
D_{min} minimum bore diameter depending
on cutter-diameter
y minimum travel

α angle of inclination in [°]
 a_p/f_z see operation data table

QUADWORX®-SERIES

Extended operation data

Quadworx® L

axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d, mm	X max. mm	α°	y mm	D _{min} mm	D _{max} mm
35	2,5	< 8,3	17	52	70
42	2,5	< 5,9	24	66	84
52	2,5	< 4,2	34	86	104
66	2,5	< 2,9	48	114	132
80	2,5	< 2,3	62	142	160
legend	see Quadworx® M	legend	see Quadworx® M	+legend	see Quadworx® M

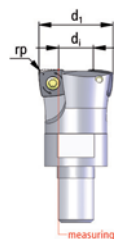
Technical information

Quadworx® S

Catalogue No.	d1	di	Size of remaining stock t
2 16 247 SG	16	5,7	0,51
3 18 247 SG	18	7,7	0,51
3 20 247 SG	20	9,7	0,51
4 25 247 SG	25	14,8	0,51
2 14 247	14	3,7	0,51
2 16 247	16	5,7	0,51
3 18 247	18	7,7	0,51
3 20 247	20	9,7	0,51
4 25 247	25	14,8	0,51



Please take notice of the theoretical corner radius, which has to be programmed. The face milling cutter leaves a material stock not pre-determinable. In order to consider this fact for following tooling, we have estimated this value. This dimension "t" is 0,51 mm (S), 0,65 mm (M), 0,83 mm (L).



Definition of measuring point for Laser-linear-monitoring: Please use diameter: di

Quadworx® M

Catalogue No.	d1	di	Size of remaining stock t
2 22 248 SG	22	7,1	0,65
3 25 248 SG	25	9,8	0,65
2 22 248	22	7,1	0,65
3 25 248	25	9,8	0,65
4 30 248	30	14,7	0,65
4 35 248	35	19,6	0,65
5 35 248	35	19,8	0,65
5 42 248	42	26,5	0,65
5 42 348	42	26,5	0,65
6 52 348	52	36,5	0,65

Quadworx® L

Catalogue No.	d1	di	Size of remaining stock t
3 35 249	35	17,7	0,83
4 42 249	42	24,7	0,83
4 42 349	42	24,7	0,83
5 52 349	52	34,7	0,83
7 66 349	66	48,7	0,83
8 80 349	80	62,7	0,83

Definitions and Dimensions

a_p depth of cut in [mm]
 f_z feed per tooth in [mm]

D_{max} = maximum bore diameter depending on cutter-diameter in [mm]
 x maximum plunge depth in [mm]

D_{min} = minimum bore diameter depending on cutter-diameter in [mm]
 y minimum travel in [mm]

α angle of inclination in [°]
 a_p/f_z see operation data table

EXTENDED OPERATION DATA

Trigaworx®- series

Trigaworx® S

axial plunging into solid block	incline plunge milling	circular milling into solid block
Cutter diam. d_1 mm	α°	α°
X max. mm	y mm	y mm
16	14,0	20
20	7,1	28
25	4,4	38

x
 f_z maximum plunge depth
see operation data table, but reduce value to 30%

y
 x
 a_p/f_z minimum travel
maximum plunge depth
see operation data table

D_{min}
 D_{max}
 a_p/f_z minimum bore diameter depending on
cutter-diameter
maximum bore diameter depending on
cutter-diameter
see operation data table

Trigaworx® M

axial plunging into solid block	incline plunge milling	circular milling into solid block
Cutter diam. d_1 mm	α°	α°
X max. mm	y mm	y mm
25	12,0	32
30	7,1	42
35	5,0	52
42	3,6	66
52	2,5	86

x
 f_z maximum plunge depth
see operation data table, but reduce value to 30%

y
 x
 a_p/f_z minimum travel
maximum plunge depth
see operation data table

D_{min}
 D_{max}
 a_p/f_z minimum bore diameter depending on
cutter-diameter
maximum bore diameter depending on
cutter-diameter
see operation data table

Definitions and Dimensions

a_p depth of cut in (mm)
 f_z feed per tooth in [m] see operation
data table

D_{max} maximum bore diameter depending
on cutter-diameter
 x maximum plunge depth

D_{min} minimum bore diameter depending
on cutter-diameter
 y minimum travel

α angle of inclination in [°]
 a_p/f_z see operation data table

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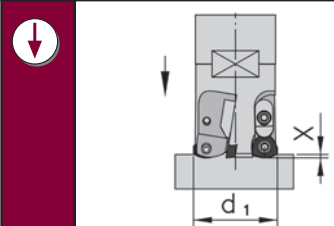
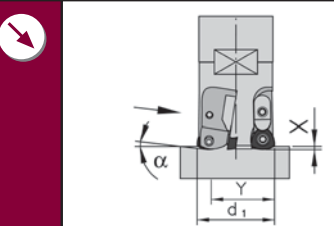
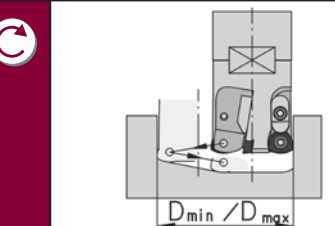
Operation Data

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EXTENDED OPERATION DATA

Trigaworx®

TRIGACUT® L

axial plunging into solid block		incline plunge milling		circular milling into solid block	
					
					
Cutter diam. d_1 mm	X max. mm	α°	y mm	α°	y mm
32	2	11,3	10	42	64
52	2	3,8	30	82	104
66	2	2,6	44	110	132
80	2	2,0	58	138	160

x
 f_z

maximum plunge depth
 see operation data table, but reduce value to 30%

y
 x
 a_p/f_z

minimum travel
 maximum plunge depth
 see operation data table

D_{min}
 D_{max}
 a_p/f_z

minimum bore diameter depending on
 cutter-diameter
 maximum bore diameter depending on
 cutter-diameter
 see operation data table

Definitions and Dimensions

a_p depth of cut in (mm)
 f_z feed per tooth in [mm]

D_{max} maximum bore diameter depending
 on cutter-diameter
 x maximum plunge depth

D_{min} minimum bore diameter depending
 on cutter-diameter
 y minimum travel

α angle of inclination in [°]
 a_p/f_z see operation data table

NOTES

This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin, light gray lines. There are no margins, text, or other markings on the page.

CUTTING SPEEDS V_c

FOR SOLID CARBIDE END MILLS



		CUTTING MATERIAL AND COATING											
Material	Application	VHM		PV		VHM		VHM		VHM		CBN uncoated	PKD uncoated
		PVTi	PVAT	PVALSA	PVCC	PVAS	PVCN	PVDIAN	PVDIAG				
Steel													
Free Machining Steel/Mild Steel	▽ ▽ ▽	150 - 250 250 - 350		200 - 350		180 - 300				500 - 1000			
Normal Tool Steel/Steel Castings	▽ ▽ ▽	150 - 220 220 - 300		150 - 220 220 - 300		150 - 250				500 - 1000			
Tool Steel and Steel Castings, both difficult to machine	▽ ▽ ▽	120 - 170 170 - 250		150 - 250		100 - 200				400 - 800			
High-temperature Alloys													
High-temperature Alloys	▽ ▽ ▽	30 - 50 50 - 80		60 - 80		50 - 60							
Titanium Alloys	▽ ▽ ▽	30 - 50 50 - 80		60 - 80		50 - 60							
Stainless Steel													
(all kinds)	▽ ▽ ▽	70 - 110 110 - 150				100 - 120							
Cast Iron													
Grey Cast Iron	▽ ▽ ▽	250 - 300 300 - 400		250 - 300 300 - 400		200 - 350				500 - 1000			
Spheroidal Graphite	▽ ▽ ▽	150 - 200 200 - 250		180 - 250		150 - 230				500 - 1000			
Tempered Castings	▽ ▽ ▽	100 - 160 160 - 200		150 - 200		120 - 180				500 - 1000			
NE-Materials													
Aluminium	▽ ▽ ▽	400 - 600		400 - 600 800 - 1000		400 - 600 800 - 1000		400 - 600 800 - 1000			500 - 1200		
Copper	▽ ▽ ▽	300 - 500		450 - 600		400 - 500 500 - 600					500 - 800		
Graphite	▽ ▽ ▽	300 - 500		350 - 500		200 - 350 350 - 500		800 - 870 870 - 1000			500 - 800		
Plastics	▽ ▽ ▽	200 - 350		350 - 500		200 - 350 350 - 500		200 - 350 350 - 500			500 - 1200		
Hardened Steel													
up to 48 HRC	▽ ▽ ▽	150 - 190								300 - 800			
up to 55 HRC	▽ ▽ ▽	120 - 250								300 - 800			
up to 65 HRC	▽ ▽ ▽	80 - 120								200 - 500			

This speed and feed values are approximate. Customer-specific factors such as input power, machine stability, tool overhang, etc. are not taken into account. In order to guarantee optimum and economic cutting conditions with our tools, please ask our office or one of our application engineers. For more detailed recommendations regarding operation data (including the tool level), please take a look at our CD-ROM catalogue.

FEED PER TOOTH/DEPTH OF CUT FOR ROUGHING 2D/3D

Feed per tooth (f_z), depth of cut (a_p)



TrigaWorx® UltraPerform

4 flutes for steel, extreme milling, high feed rates
side steps (width a_e) for steel: 60-95% of end mill diameter



roughing



pre-finishing

Material	f_z/a_p	Application	$\phi 3-4,9$	$\phi 5-6,9$	$\phi 7-8,9$	$\phi 9-10,9$	$\phi 11-12,9$	$\phi 15-16,9$
Steel								
Free Machining Steel/ Mild Steel	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,2	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,30 0,10 - 0,20 0,30 - 0,50 0,20 - 0,30	0,10 - 0,40 0,10 - 0,20 0,40 - 0,70 0,20 - 0,30	0,10 - 0,45 0,10 - 0,20 0,45 - 0,80 0,20 - 0,30	0,10 - 0,45 0,10 - 0,25 0,45 - 0,80 0,25 - 0,40
Normal Tool Steel/Steel Castings	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,25 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,25 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,35 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30	0,10 - 0,35 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30
Tool Steel and Steel Castings, both difficult to machine	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,25 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,25 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,35 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30	0,10 - 0,35 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30
High-temperature Alloys								
High-temperature Alloys	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,30 0,10 - 0,20 0,30 - 0,50 0,20 - 0,30	0,10 - 0,40 0,10 - 0,20 0,40 - 0,70 0,20 - 0,30	0,10 - 0,45 0,10 - 0,20 0,45 - 0,80 0,20 - 0,30	0,10 - 0,45 0,10 - 0,25 0,45 - 0,80 0,25 - 0,40
Titanium Alloys	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,30 0,10 - 0,20 0,30 - 0,50 0,20 - 0,30	0,10 - 0,40 0,10 - 0,20 0,40 - 0,70 0,20 - 0,30	0,10 - 0,45 0,10 - 0,20 0,45 - 0,80 0,20 - 0,30	0,10 - 0,45 0,10 - 0,25 0,45 - 0,80 0,25 - 0,40
Stainless Steel								
(all kinds)	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,30 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,40 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,45 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30	0,10 - 0,45 0,25 - 0,40 0,35 - 0,60 0,20 - 0,30
Cast Iron								
Grey Cast Iron	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,30 0,10 - 0,20 0,30 - 0,50 0,20 - 0,30	0,10 - 0,40 0,10 - 0,20 0,40 - 0,70 0,20 - 0,30	0,10 - 0,45 0,10 - 0,20 0,45 - 0,80 0,20 - 0,30	0,10 - 0,45 0,10 - 0,25 0,45 - 0,80 0,25 - 0,40
Spheroidal Graphite	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,25 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,25 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,35 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30	0,10 - 0,35 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30
Tempered Castings	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,25 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,25 0,10 - 0,20 0,25 - 0,40 0,20 - 0,30	0,10 - 0,35 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30	0,10 - 0,35 0,10 - 0,20 0,35 - 0,60 0,20 - 0,30
Hardened Steel								
up to 48 HRC	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,80 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,20 0,225 - 0,35 0,20 - 0,30	0,10 - 0,30 0,10 - 0,20 0,30 - 0,50 0,20 - 0,30	0,10 - 0,40 0,10 - 0,20 0,40 - 0,70 0,20 - 0,30	0,10 - 0,45 0,10 - 0,20 0,45 - 0,80 0,20 - 0,30	0,10 - 0,45 0,10 - 0,25 0,45 - 0,80 0,25 - 0,40
up to 55 HRC	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,15 0,15 - 0,25 0,15 - 0,20	0,10 - 0,225 0,10 - 0,15 0,225 - 0,35 0,15 - 0,20	0,10 - 0,25 0,10 - 0,15 0,25 - 0,40 0,15 - 0,20	0,10 - 0,25 0,10 - 0,15 0,25 - 0,40 0,15 - 0,20	0,10 - 0,35 0,10 - 0,15 0,35 - 0,60 0,15 - 0,20	0,10 - 0,35 0,10 - 0,15 0,35 - 0,60 0,15 - 0,20
up to 65 HRC	f_z (mm) a_p (mm) f_z (mm) a_p (mm)	 	0,08 - 0,15 0,10 - 0,13 0,15 - 0,20 0,13 - 0,15	0,10 - 0,225 0,10 - 0,15 0,20 - 0,30 0,15 - 0,20	0,10 - 0,25 0,10 - 0,15 0,20 - 0,30 0,15 - 0,20	0,10 - 0,25 0,10 - 0,15 0,25 - 0,35 0,15 - 0,20	0,10 - 0,35 0,10 - 0,15 0,30 - 0,40 0,15 - 0,20	0,10 - 0,35 0,10 - 0,15 0,35 - 0,45 0,15 - 0,20

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FEED PER TOOTH/DEPTH OF CUT FOR 3D COPY MILLING

Feed per tooth (f_z), depth of cut (a_p)



Material	f_z/a_p	$\phi < 1$	$\phi 1-2$	$\phi 3-4$	$\phi 5-6$	$\phi 7-8$
Steel						
Free Machining Steel/ Mild Steel	f_z (mm) a_p (mm)	0,005 - 0,02 0,01 - 0,1	0,01 - 0,04 0,06 - 0,2	0,04 - 0,07 0,12 - 0,4	0,08 - 0,12 0,15 - 0,6	0,08 - 0,15 0,25 - 0,8
Normal Tool Steel/Steel Castings	f_z (mm) a_p (mm)	0,005 - 0,02 0,01 - 0,1	0,01 - 0,04 0,05 - 0,15	0,04 - 0,07 0,06 - 0,3	0,08 - 0,12 0,15 - 0,6	0,08 - 0,15 0,25 - 0,8
Tool Steel and Steel Castings, both difficult to machine	f_z (mm) a_p (mm)	0,005 - 0,02 0,005 - 0,08	0,01 - 0,04 0,05 - 0,15	0,04 - 0,07 0,08 - 0,3	0,08 - 0,12 0,1 - 0,4	0,08 - 0,15 0,15 - 0,6
High-temperature Alloys						
High-temperature Alloys	f_z (mm) a_p (mm)	0,005 - 0,02 0,005 - 0,08	0,01 - 0,04 0,05 - 0,15	0,04 - 0,07 0,08 - 0,3	0,08 - 0,12 0,1 - 0,4	0,08 - 0,15 0,15 - 0,6
Titanium Alloys	f_z (mm) a_p (mm)	0,005 - 0,02 0,005 - 0,08	0,01 - 0,04 0,05 - 0,15	0,04 - 0,07 0,08 - 0,3	0,08 - 0,12 0,1 - 0,4	0,08 - 0,15 0,15 - 0,6
Stainless Steel						
(all kinds)	f_z (mm) a_p (mm)	0,005 - 0,02 0,005 - 0,08	0,01 - 0,04 0,05 - 0,15	0,04 - 0,07 0,08 - 0,3	0,08 - 0,12 0,1 - 0,4	0,08 - 0,15 0,15 - 0,6
Cast Iron						
Grey Cast Iron	f_z (mm) a_p (mm)	0,005 - 0,02 0,005 - 0,08	0,01 - 0,04 0,06 - 0,2	0,04 - 0,07 0,12 - 0,4	0,08 - 0,12 0,15 - 0,6	0,08 - 0,15 0,25 - 0,8
Spheroidal Graphite	f_z (mm) a_p (mm)	0,005 - 0,02 0,01 - 0,1	0,01 - 0,04 0,06 - 0,2	0,04 - 0,07 0,06 - 0,2	0,08 - 0,12 0,12 - 0,4	0,08 - 0,15 0,15 - 0,6
Tempered Castings	f_z (mm) a_p (mm)	0,005 - 0,02 0,01 - 0,1	0,01 - 0,04 0,06 - 0,2	0,04 - 0,07 0,12 - 0,4	0,08 - 0,12 0,15 - 0,5	0,08 - 0,15 0,25 - 0,8
NE - Materials						
Aluminium	f_z (mm) a_p (mm)	0,01 - 0,03 0,03 - 0,3	0,02 - 0,08 0,1 - 0,7	0,04 - 0,1 0,2 - 1,4	0,06 - 0,15 0,3 - 2,0	0,08 - 0,2 0,4 - 2,8
Copper	f_z (mm) a_p (mm)	0,01 - 0,03 0,01 - 0,15	0,02 - 0,08 0,1 - 0,35	0,04 - 0,1 0,2 - 0,7	0,06 - 0,15 0,3 - 1,0	0,08 - 0,2 0,4 - 1,3
Graphite	f_z (mm) a_p (mm)	0,01 - 0,03 0,01 - 0,3	0,02 - 0,08 0,1 - 0,5	0,04 - 0,1 0,15 - 1,0	0,06 - 0,15 0,2 - 1,5	0,08 - 0,2 0,3 - 2,0
Plastics	f_z (mm) a_p (mm)	0,01 - 0,03 0,03 - 0,15	0,02 - 0,08 0,1 - 0,3	0,04 - 0,1 0,15 - 0,4	0,06 - 0,15 0,2 - 0,5	0,08 - 0,2 0,3 - 0,7
Hardened Steel						
up to 48HRC	f_z (mm) a_p (mm)	0,005 - 0,015 0,005 - 0,05	0,01 - 0,03 0,04 - 0,1	0,04 - 0,07 0,08 - 0,2	0,08 - 0,12 0,1 - 0,3	0,08 - 0,12 0,15 - 0,4
up to 55HRC	f_z (mm) a_p (mm)	0,005 - 0,015 0,005 - 0,05	0,01 - 0,03 0,04 - 0,1	0,04 - 0,07 0,08 - 0,2	0,08 - 0,12 0,1 - 0,3	0,08 - 0,12 0,15 - 0,4
up to 65HRC	f_z (mm) a_p (mm)	0,005 - 0,015 0,005 - 0,05	0,01 - 0,03 0,04 - 0,1	0,04 - 0,07 0,08 - 0,2	0,08 - 0,12 0,1 - 0,3	0,08 - 0,12 0,15 - 0,4

This speed and feed values are approximate. Customer-specific factors such as input power, machine stability, tool overhang, etc. are not taken into account. In order to guarantee optimum and economic cutting conditions with our tools, please ask our office or one of our application engineers. For more detailed recommendations regarding operation data (including the tool level), please take a look at our CD-ROM catalogue.

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$\emptyset 9-10$	$\emptyset 11-12$	$\emptyset 13-14$	$\emptyset 15-16$	$\emptyset 17-18$	$\emptyset 19-20$	f_z/a_p	Material
							Steel
0,08 - 0,15 0,3 - 1,0	0,08 - 0,15 0,3 - 1,2	0,08 - 0,15 0,3 - 1,4	0,1 - 0,25 0,3 - 1,6	0,1 - 0,25 0,3 - 1,8	0,1 - 0,25 0,3 - 2,0	f_z (mm) a_p (mm)	Free Machining Steel/ Mild Steel
0,08 - 0,15 0,3 - 1,0	0,08 - 0,15 0,3 - 1,2	0,08 - 0,15 0,3 - 1,4	0,1 - 0,25 0,3 - 1,6	0,1 - 0,25 0,3 - 1,8	0,1 - 0,25 0,3 - 2,0	f_z (mm) a_p (mm)	Normal Tool Steel/Steel Castings
0,08 - 0,15 0,2 - 0,7	0,08 - 0,15 0,2 - 0,8	0,08 - 0,15 0,2 - 1,0	0,1 - 0,25 0,2 - 1,2	0,1 - 0,25 0,2 - 1,3	0,1 - 0,25 0,2 - 1,4	f_z (mm) a_p (mm)	Tool Steel and Steel Castings, both difficult to machine
							High-temperature Alloys
0,08 - 0,15 0,2 - 0,7	0,08 - 0,15 0,2 - 0,8	0,08 - 0,15 0,2 - 1,0	0,1 - 0,25 0,2 - 1,2	0,1 - 0,25 0,2 - 1,3	0,1 - 0,25 0,2 - 1,4	f_z (mm) a_p (mm)	High-temperature Alloys
0,08 - 0,15 0,2 - 0,7	0,08 - 0,15 0,2 - 0,8	0,08 - 0,15 0,2 - 1,0	0,1 - 0,25 0,2 - 1,2	0,1 - 0,25 0,2 - 1,3	0,1 - 0,25 0,2 - 1,4	f_z (mm) a_p (mm)	Titanium Alloys
							Stainless Steel
0,08 - 0,15 0,2 - 0,7	0,08 - 0,15 0,2 - 0,8	0,08 - 0,15 0,2 - 1,0	0,1 - 0,25 0,2 - 1,2	0,1 - 0,25 0,2 - 1,3	0,1 - 0,25 0,2 - 1,4	f_z (mm) a_p (mm)	(all kinds)
							Cast Iron
0,08 - 0,15 0,3 - 1,0	0,08 - 0,15 0,3 - 1,2	0,08 - 0,15 0,3 - 1,4	0,1 - 0,25 0,3 - 1,6	0,1 - 0,25 0,3 - 1,8	0,1 - 0,25 0,3 - 2,0	f_z (mm) a_p (mm)	Grey Cast Iron
0,08 - 0,15 0,3 - 1,0	0,08 - 0,15 0,3 - 1,2	0,08 - 0,15 0,3 - 1,4	0,1 - 0,25 0,3 - 1,6	0,1 - 0,25 0,3 - 1,8	0,1 - 0,25 0,3 - 2,0	f_z (mm) a_p (mm)	Spheroidal Graphite
0,08 - 0,15 0,3 - 1,0	0,08 - 0,15 0,3 - 1,2	0,08 - 0,15 0,3 - 1,4	0,1 - 0,25 0,3 - 1,6	0,1 - 0,25 0,3 - 1,8	0,1 - 0,25 0,3 - 2,0	f_z (mm) a_p (mm)	Tempered Castings
							Non - ferrous Materials
0,08 - 0,25 0,5 - 3,5	0,1 - 0,3 0,5 - 4,2	0,1 - 0,3 0,5 - 5,0	0,1 - 0,3 0,5 - 5,6	0,1 - 0,3 0,5 - 6,5	0,1 - 0,25 0,5 - 7,0	f_z (mm) a_p (mm)	Aluminium
0,08 - 0,25 0,5 - 1,7	0,1 - 0,3 0,5 - 2,0	0,1 - 0,3 0,5 - 2,4	0,1 - 0,3 0,5 - 2,7	0,1 - 0,3 0,5 - 3,0	0,1 - 0,25 0,5 - 3,5	f_z (mm) a_p (mm)	Copper
0,08 - 0,25 0,4 - 2,5	0,1 - 0,3 0,4 - 3,0	0,1 - 0,3 0,4 - 3,5	0,1 - 0,3 0,4 - 4,0	0,1 - 0,3 0,4 - 4,5	0,1 - 0,25 0,4 - 5,0	f_z (mm) a_p (mm)	Graphite
0,08 - 0,25 0,4 - 1,0	0,1 - 0,3 0,4 - 1,2	0,1 - 0,3 0,4 - 1,3	0,1 - 0,3 0,4 - 1,5	0,1 - 0,3 0,4 - 1,7	0,1 - 0,25 0,4 - 2,0	f_z (mm) a_p (mm)	Plastics
							Hardened Steel
0,08 - 0,12 0,2 - 0,5	0,08 - 0,15 0,2 - 0,6	0,08 - 0,15 0,2 - 0,7	0,08 - 0,15 0,2 - 0,8	0,08 - 0,15 0,2 - 0,8	0,08 - 0,15 0,2 - 0,8	f_z (mm) a_p (mm)	up to 48HRC
0,08 - 0,12 0,2 - 0,5	0,08 - 0,15 0,2 - 0,6	0,08 - 0,15 0,2 - 0,7	0,08 - 0,15 0,2 - 0,8	0,08 - 0,15 0,2 - 0,8	0,08 - 0,15 0,2 - 0,8	f_z (mm) a_p (mm)	up to 55HRC
0,08 - 0,12 0,2 - 0,45	0,08 - 0,15 0,2 - 0,5	0,08 - 0,15 0,2 - 0,6	0,08 - 0,15 0,2 - 0,6	0,08 - 0,15 0,2 - 0,6	0,08 - 0,15 0,2 - 0,6	f_z (mm) a_p (mm)	up to 65HRC

FEED PER TOOTH/DEPTH OF CUT FOR POCKET- AND SLOT MILLING

Feed per tooth (f_z), depth of cut (a_p)



Material	f_z	$\emptyset 2$	$\emptyset 3-4$	$\emptyset 5-6$	$\emptyset 7-8$	$\emptyset 9-10$
Steel						
Free Machining Steel/ Mild Steel	f_z (mm) a_p (mm)	0,02 - 0,04 1,0 - 1,5	0,03 - 0,06 1,5 - 2,0	0,05 - 0,08 2,5 - 3,0	0,05 - 0,08 3,5 - 4,0	0,06 - 0,10 4,5 - 5,0
Normal Tool Steel/Steel Castings	f_z (mm) a_p (mm)	0,02 - 0,04 1,0 - 1,5	0,03 - 0,06 1,5 - 2,0	0,05 - 0,08 2,5 - 3,0	0,05 - 0,08 3,5 - 4,0	0,06 - 0,10 4,5 - 5,0
Tool Steel and Steel Castings, both difficult to machine	f_z (mm) a_p (mm)	0,02 - 0,04 1,0 - 1,5	0,03 - 0,06 1,5 - 2,0	0,05 - 0,08 2,5 - 3,0	0,05 - 0,08 3,5 - 4,0	0,06 - 0,10 4,5 - 5,0
Stainless Steel						
(all kinds)	f_z (mm) a_p (mm)	0,02 - 0,04 0,3 - 0,7	0,03 - 0,06 0,7 - 1,2	0,05 - 0,08 1,5 - 1,8	0,05 - 0,08 2,0 - 2,5	0,06 - 0,10 2,5 - 3,0
Cast Iron						
Grey Cast Iron	f_z (mm) a_p (mm)	0,02 - 0,04 1,0 - 1,5	0,3 - 0,6 1,5 - 2,0	0,05 - 0,08 2,5 - 3,0	0,05 - 0,08 3,5 - 4,0	0,06 - 0,10 4,5 - 5,0
Spheroidal Graphite	f_z (mm) a_p (mm)	0,02 - 0,04 1,0 - 1,5	0,3 - 0,6 1,5 - 2,0	0,05 - 0,08 2,5 - 3,0	0,05 - 0,08 3,5 - 4,0	0,06 - 0,10 4,5 - 5,0
Tempered Castings	f_z (mm) a_p (mm)	0,02 - 0,04 1,0 - 1,5	0,3 - 0,6 1,5 - 2,0	0,05 - 0,08 2,5 - 3,0	0,05 - 0,08 3,5 - 4,0	0,06 - 0,10 4,5 - 5,0
Hardened Steel						
up to 48 HRC	f_z (mm) a_p (mm)	0,02 - 0,04 0,04 - 0,1	0,03 - 0,6 0,08 - 0,2	0,05 - 0,08 0,1 - 0,3	0,05 - 0,08 0,15 - 0,4	0,06 - 0,10 0,2 - 0,5
up to 55 HRC	f_z (mm) a_p (mm)	0,02 - 0,04 0,04 - 0,1	0,03 - 0,6 0,08 - 0,2	0,05 - 0,08 0,1 - 0,3	0,05 - 0,08 0,15 - 0,4	0,06 - 0,10 0,2 - 0,5
up to 65 HRC	f_z (mm) a_p (mm)	0,02 - 0,04 0,04 - 0,1	0,03 - 0,6 0,08 - 0,2	0,05 - 0,08 0,1 - 0,3	0,05 - 0,08 0,15 - 0,4	0,06 - 0,10 0,2 - 0,5

This speed and feed values are approximate. Customer-specific factors such as input power, machine stability, tool overhang, etc. are not taken into account. In order to guarantee optimum and economic cutting conditions with our tools, please ask our office or one of our application engineers. For more detailed recommendations regarding operation data (including the tool level), please take a look at our CD-ROM catalogue.

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					Steel
0,07 - 0,12 5,0 - 6,0	0,08 - 0,12 6,0 - 8,0	0,08 - 0,12 6,0 - 8,0	0,08 - 0,12 6,0 - 8,0	f_z (mm) a_p (mm)	Free Machining Steel/ Mild Steel
0,07 - 0,12 5,0 - 6,0	0,08 - 0,12 6,0 - 8,0	0,08 - 0,12 6,0 - 8,0	0,08 - 0,12 6,0 - 8,0	f_z (mm) a_p (mm)	Normal Tool Steel/Steel Castings
0,07 - 0,12 5,0 - 6,0	0,08 - 0,12 6,0 - 8,0	0,08 - 0,12 6,0 - 8,0	0,08 - 0,12 6,0 - 8,0	f_z (mm) a_p (mm)	Tool Steel and Steel Castings, both difficult to machine
					Stainless Steel
0,07 - 0,12 3,5 - 4,0	0,08 - 0,12 4,0 - 4,5	0,08 - 0,12 4,0 - 4,5	0,08 - 0,12 4,0 - 4,5	f_z (mm) a_p (mm)	(all kinds)
					Cast Iron
0,07 - 0,12 5,0 - 6,0	0,08 - 0,12 6,0 - 0,8	0,08 - 0,12 6,0 - 0,8	0,08 - 0,12 6,0 - 0,8	f_z (mm) a_p (mm)	Grey Cast Iron
0,07 - 0,12 5,0 - 6,0	0,08 - 0,12 6,0 - 0,8	0,08 - 0,12 6,0 - 0,8	0,08 - 0,12 6,0 - 0,8	f_z (mm) a_p (mm)	Spheroidal Graphite
0,07 - 0,12 5,0 - 6,0	0,08 - 0,12 6,0 - 0,8	0,08 - 0,12 6,0 - 0,8	0,08 - 0,12 6,0 - 0,8	f_z (mm) a_p (mm)	Tempered Castings
					Hardened Steel
0,07 - 0,12 0,2 - 0,7	0,08 - 0,12 0,2 - 0,8	0,08 - 0,12 0,2 - 0,8	0,08 - 0,12 0,2 - 0,8	f_z (mm) a_p (mm)	up to 48 HRC
0,07 - 0,12 0,2 - 0,7	0,08 - 0,12 0,2 - 0,8	0,08 - 0,12 0,2 - 0,8	0,08 - 0,12 0,2 - 0,8	f_z (mm) a_p (mm)	up to 55 HRC
0,07 - 0,12 0,2 - 0,7	0,08 - 0,12 0,2 - 0,8	0,08 - 0,12 0,2 - 0,8	0,08 - 0,12 0,2 - 0,8	f_z (mm) a_p (mm)	up to 65 HRC

FEED PER TOOTH/DEPTH OF CUT FOR CONTOUR MILLING

Feed per tooth (f_z), depth of cut (a_p); up to 100 % of cutting length



side cutting width (a_e) for non-hardened materials: up to 20% of end mill diameter
side cutting width (a_e) for hardened materials: up to 5% of end mill diameter

Material	f_z	$\varnothing 2$	$\varnothing 3-4$	$\varnothing 5-6$	$\varnothing 7-8$	$\varnothing 9-10$
Steel						
Free Machining Steel/ Mild Steel	f_z (mm)	0,05 - 0,09	0,09 - 0,12	0,12 - 0,18	0,12 - 0,18	0,15 - 0,20
Normal Tool Steel/Steel Castings	f_z (mm)	0,05 - 0,09	0,09 - 0,12	0,12 - 0,18	0,12 - 0,18	0,15 - 0,20
Tool Steel and Steel Castings, both difficult to machine	f_z (mm)	0,05 - 0,09	0,09 - 0,12	0,12 - 0,18	0,12 - 0,18	0,15 - 0,20
Stainless Steel						
(all kinds)	f_z (mm)	0,05 - 0,09	0,09 - 0,12	0,12 - 0,18	0,12 - 0,18	0,15 - 0,20
Cast Iron						
Grey Cast Iron	f_z (mm)	0,05 - 0,09	0,05 - 0,03	0,09 - 0,12	0,12 - 0,18	0,12 - 0,18
Spheroidal Graphite	f_z (mm)	0,05 - 0,09	0,09 - 0,12	0,12 - 0,18	0,12 - 0,18	0,15 - 0,20
Tempered Castings	f_z (mm)	0,05 - 0,09	0,09 - 0,12	0,12 - 0,18	0,12 - 0,18	0,15 - 0,20
Hardened Steel						
up to 48 HRC	f_z (mm)	0,03 - 0,06	0,07 - 0,10	0,10 - 0,15	0,10 - 0,15	0,12 - 0,17
up to 55 HRC	f_z (mm)	0,03 - 0,06	0,07 - 0,10	0,10 - 0,15	0,10 - 0,15	0,12 - 0,17
up to 65 HRC	f_z (mm)	0,03 - 0,06	0,07 - 0,10	0,10 - 0,15	0,10 - 0,15	0,12 - 0,17

This speed and feed values are approximate. Customer-specific factors such as input power, machine stability, tool overhang, etc. are not taken into account. In order to guarantee optimum and economic cutting conditions with our tools, please ask our office or one of our application engineers.
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					Steel
0,15 - 0,20	0,20 - 0,25	0,20 - 0,25	0,25 - 0,30	f_z (mm)	Free Machining Steel/ Mild Steel
0,15 - 0,20	0,20 - 0,25	0,20 - 0,25	0,25 - 0,30	f_z (mm)	Normal Tool Steel/Steel Castings
0,15 - 0,20	0,20 - 0,25	0,20 - 0,25	0,25 - 0,30	f_z (mm)	Tool Steel and Steel Castings, both difficult to machine
					Stainless Steel
0,15 - 0,20	0,20 - 0,25	0,20 - 0,25	0,25 - 0,30	f_z (mm)	(all kinds)
					Cast Iron
0,15 - 0,20	0,15 - 0,20	0,20 - 0,25	0,20 - 0,25	f_z (mm)	Grey Cast Iron
0,15 - 0,20	0,20 - 0,25	0,20 - 0,25	0,25 - 0,30	f_z (mm)	Spheroidal Graphite
0,15 - 0,20	0,20 - 0,25	0,20 - 0,25	0,25 - 0,30	f_z (mm)	Tempered Castings
					Hardened Steel
0,17 - 0,22	0,17 - 0,22	0,17 - 0,22	0,20 - 0,25	f_z (mm)	up to 48 HRC
0,17 - 0,22	0,17 - 0,22	0,17 - 0,22	0,20 - 0,25	f_z (mm)	up to 55 HRC
0,17 - 0,22	0,17 - 0,22	0,17 - 0,22	0,20 - 0,25	f_z (mm)	up to 65 HRC

SOLID CARBIDE FOR CONTOUR-MILLING

Feed per tooth (f_z), depth of cut (a_p)



side cutting width (a_e) for non-hardened materials: up to 10% of end mill diameter

side cutting width (a_e) for hardened materials: up to 2% of end mill diameter

Material	f_z	$\varnothing 2$	$\varnothing 3-4$	$\varnothing 5-6$	$\varnothing 7-8$	$\varnothing 9-10$
Steel						
Free Machining Steel/ Mild Steel	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
Normal Tool Steel/Steel Castings	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
Tool Steel and Steel Castings, both difficult to machine	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
High-temperature Alloys						
High-temperature Alloys	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
Titanium Alloys	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
Stainless Steel						
(all kinds)	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
Cast Iron						
Grey Cast Iron	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
Spheroidal Graphite	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
Tempered Castings	f_z (mm)	0,01 - 0,03	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
Hardened Steel						
up to 48 HRC	f_z (mm)	0,01 - 0,02	0,01 - 0,03	0,02 - 0,04	0,02 - 0,04	0,03 - 0,05
up to 55 HRC	f_z (mm)	0,01 - 0,02	0,01 - 0,03	0,02 - 0,04	0,02 - 0,04	0,03 - 0,05
up to 65 HRC	f_z (mm)	0,01 - 0,02	0,01 - 0,03	0,02 - 0,04	0,02 - 0,04	0,03 - 0,05

This speed and feed values are approximate. Customer-specific factors such as input power, machine stability, tool overhang, etc. are not taken into account. In order to guarantee optimum and economic cutting conditions with our tools, please ask our office or one of our application engineers. For more detailed recommendations regarding operation data (including the tool level), please take a look at our CD-ROM catalogue.

SOLID CARBIDE FOR MULTIPLE-FLUTE END MILLS

Feed per tooth (f_z), depth of cut (a_p)



$\varnothing 11 - 12$	$\varnothing 13 - 14$	$\varnothing 15 - 16$	$\varnothing 17 - 18$	f_z	Material
					Steel
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	Free Machining Steel/ Mild Steel
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	Normal Tool Steel/Steel Castings
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	Tool Steel and Steel Castings, both difficult to machine
					High-temperature Alloys
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	High-temperature Alloys
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	Titanium Alloys
					Stainless Steel
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	(all kinds)
					Cast Iron
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	Grey Cast Iron
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	Spheroidal Graphite
0,05 - 0,07	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	f_z (mm)	Tempered Castings
					Hardened Steel
0,03 - 0,05	0,04 - 0,06	0,04 - 0,06	0,04 - 0,06	f_z (mm)	up to 48 HRC
0,03 - 0,05	0,04 - 0,06	0,04 - 0,06	0,04 - 0,06	f_z (mm)	up to 55 HRC
0,03 - 0,05	0,04 - 0,06	0,04 - 0,06	0,04 - 0,06	f_z (mm)	up to 65 HRC

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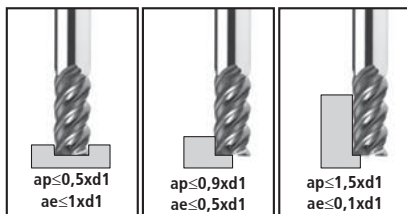
Index

SPEED/FEED PER TOOTH/DEPTH OF CUT

UGT- end mills for pocket-, slot- and copy-milling



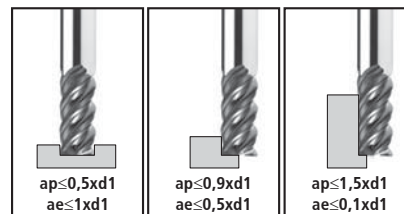
1.4301, 1.4541, 1.4307 etc.:
stainless steel



feed per tooth f_z
 $V_c = 80$ m/min

d_1	f_z	f_z	f_z
3	0,015	0,018	0,015
4	0,020	0,023	0,020
5	0,025	0,029	0,025
6	0,030	0,035	0,040
8	0,040	0,047	0,054
10	0,055	0,064	0,073
12	0,065	0,075	0,085
16	0,085	0,100	0,115
20	0,105	0,120	0,135
25	0,120	0,140	0,160

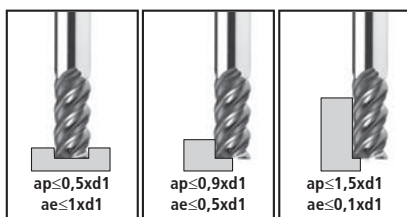
1.4401, 1.4571, 1.4404 etc.:
stainless steel



feed per tooth f_z
 $V_c = 40$ m/min

d_1	f_z	f_z	f_z
3	0,010	0,015	0,018
4	0,013	0,020	0,025
5	0,019	0,025	0,031
6	0,024	0,030	0,036
8	0,034	0,040	0,053
10	0,044	0,055	0,071
12	0,056	0,065	0,077
16	0,071	0,085	0,089
20	0,087	0,950	0,100
25	0,100	0,120	0,140

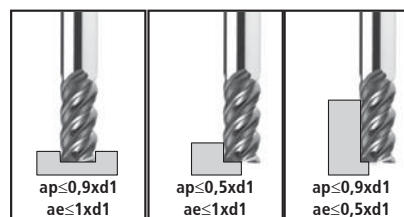
High-temperature alloys:
1.4542 etc.



feed per tooth f_z
 $V_c = 25$ m/min

d_1	f_z	f_z	f_z
3	0,004	0,007	0,010
4	0,006	0,010	0,015
5	0,010	0,014	0,020
6	0,015	0,020	0,025
8	0,025	0,030	0,035
10	0,030	0,035	0,040
12	0,040	0,045	0,050
16	0,050	0,060	0,065
20	0,060	0,070	0,075
25	0,070	0,080	0,085

Inconel 718 etc.:



feed per tooth f_z
 $V_c = 15$ m/min

d_1	f_z	f_z	f_z
3	0,004	0,007	0,010
4	0,006	0,010	0,015
5	0,010	0,014	0,020
6	0,015	0,020	0,025
8	0,025	0,030	0,035
10	0,030	0,035	0,040
12	0,040	0,045	0,050
16	0,050	0,060	0,065
20	0,060	0,070	0,075
25	0,070	0,080	0,850

This speed and feet values are approximate. Customer-specific factors such as input power, machine stability, tool overhang, etc. are not taken into account. In order to guarantee optimum and economic cutting conditions with our tools, please ask our office or one of our application engineers.

SPEED/FEED PER TOOTH/DEPTH OF CUT FOR 3D COPY MILLING

FGT/FGT AT

1722 85 0722 85	Dm. 0,4 - 0,8 mm				Dm. 1 - 3 mm				Dm. 4 - 6 mm				Dm. 8 - 12 mm					
	Tool Steel																	
	f _z (mm)		0,005 - 0,02				0,01 - 0,05				0,05 - 0,1				0,08 - 0,12			
	a _p (mm)		0,01 - 0,05				0,01 - 0,1				0,1 - 0,25				0,1 - 0,3			
	V _c (m/min)		150 - 300				150 - 300				150 - 300				150 - 300			
High-temperature Alloys																		
f _z (mm)		0,005 - 0,02				0,01 - 0,05				0,05 - 0,1				0,08 - 0,12				
a _p (mm)		0,01 - 0,05				0,01 - 0,1				0,1 - 0,25				0,1 - 0,35				
V _c (m/min)		60 - 100				60 - 100				60 - 100				60 - 100				
Hardened Steel																		
f _z (mm)		0,005 - 0,02				0,01 - 0,05				0,05 - 0,1				0,08 - 0,12				
a _p (mm)		0,01 - 0,03				0,01 - 0,1				0,1 - 0,25				0,1 - 0,35				
V _c (m/min)		150 - 300				150 - 300				150 - 300				150 - 300				

FEED PER TOOTH/DEPTH OF CUT FOR GGT

for roughing operations in graphite

d_1 (mm)	V_c (m/min) graphite w. fine grain size	V_c (m/min) graphite w. mean grain size	V_c (m/min) graphite w. coarse grain size	V_f (mm/min)	a_o (mm)	a_e (mm)
3	400	600	800	3000 - 5000	2	3
4	400	600	800	3500 - 5500	3	4
5	400	600	800	3750 - 6250	4	5
6	400	600	800	4000 - 7000	5	6
8	400	600	800	4500 - 8000	6	8
10	400	600	800	5000 - 8500	8	10
12	400	600	800	6000 - 9000	10	12
16	400	600	800	7000 - 10000	12	16

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IDENTIFICATION CODE ACCORDING ISO 1832

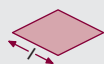
INDEXABLE INSERTS

Example of identification code according to DIN ISO 1832

R D H X																																																							
1	2	3	4																																																				
Shape	Clearance angle	Tolerances	Symbols for fixing and chipbreakers																																																				
A B C D E H K L M O P R S T V W	A B C D E O for other clearance angles that require a more precise description	T d m C d m D d m s <table> <tr> <th></th><th>d</th><th>m</th><th>s</th></tr> <tr> <td>A</td><td>$\pm 0,025$</td><td>$\pm 0,005$</td><td>$\pm 0,025$</td></tr> <tr> <td>C</td><td>$\pm 0,025$</td><td>$\pm 0,013$</td><td>$\pm 0,025$</td></tr> <tr> <td>E</td><td>$\pm 0,025$</td><td>$\pm 0,025$</td><td>$\pm 0,025$</td></tr> <tr> <td>F</td><td>$\pm 0,013$</td><td>$\pm 0,005$</td><td>$\pm 0,025$</td></tr> <tr> <td>G</td><td>$\pm 0,025$</td><td>$\pm 0,025$</td><td>$\pm 0,05-0,13$</td></tr> <tr> <td>H</td><td>$\pm 0,013$</td><td>$\pm 0,013$</td><td>$\pm 0,025$</td></tr> <tr> <td>J1</td><td>$\pm 0,05-0,15^2$</td><td>$\pm 0,005$</td><td>$\pm 0,025$</td></tr> <tr> <td>K1</td><td>$\pm 0,05-0,15^2$</td><td>$\pm 0,013$</td><td>$\pm 0,025$</td></tr> <tr> <td>L1</td><td>$\pm 0,05-0,15^2$</td><td>$\pm 0,025$</td><td>$\pm 0,025$</td></tr> <tr> <td>M</td><td>$\pm 0,05-0,15^2$</td><td>$\pm 0,02-0,08^2$</td><td>$\pm 0,05-0,13$</td></tr> <tr> <td>N</td><td>$\pm 0,05-0,15^2$</td><td>$\pm 0,02-0,08^2$</td><td>$\pm 0,025$</td></tr> <tr> <td>U</td><td>$\pm 0,08-0,15^2$</td><td>$\pm 0,13-0,38^2$</td><td>$\pm 0,13$</td></tr> </table> ¹ inserts with ground wiper edges ² depending on size of inserts (see ISO-Norm 1832)		d	m	s	A	$\pm 0,025$	$\pm 0,005$	$\pm 0,025$	C	$\pm 0,025$	$\pm 0,013$	$\pm 0,025$	E	$\pm 0,025$	$\pm 0,025$	$\pm 0,025$	F	$\pm 0,013$	$\pm 0,005$	$\pm 0,025$	G	$\pm 0,025$	$\pm 0,025$	$\pm 0,05-0,13$	H	$\pm 0,013$	$\pm 0,013$	$\pm 0,025$	J1	$\pm 0,05-0,15^2$	$\pm 0,005$	$\pm 0,025$	K1	$\pm 0,05-0,15^2$	$\pm 0,013$	$\pm 0,025$	L1	$\pm 0,05-0,15^2$	$\pm 0,025$	$\pm 0,025$	M	$\pm 0,05-0,15^2$	$\pm 0,02-0,08^2$	$\pm 0,05-0,13$	N	$\pm 0,05-0,15^2$	$\pm 0,02-0,08^2$	$\pm 0,025$	U	$\pm 0,08-0,15^2$	$\pm 0,13-0,38^2$	$\pm 0,13$	A B C F G H J M N Q R T U W $\beta = 70-90^\circ$ $\beta = 70-90^\circ$ $\beta = 40-60^\circ$ $\beta = 40-60^\circ$ $\beta = 70-90^\circ$ $\beta = 40-60^\circ$ $\beta = 70-90^\circ$ $\beta = 40-60^\circ$
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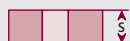
16 04 M0 T N -

5

Length of
cutting edge


6

Thickness



$s = 1,59 \text{ 01}$
 $s = 1,98 \text{ T1}$
 $s = 2,38 \text{ 02}$
 $s = 2,78 \text{ T2}$
 $s = 3,18 \text{ 03}$
 $s = 3,97 \text{ T3}$
 $s = 4,76 \text{ 04}$
 $s = 5,56 \text{ 05}$
 $s = 6,35 \text{ 06}$
 $s = 7,94 \text{ 07}$
 $s = 9,52 \text{ 09}$

7

Corner configu-
ration


$r = 0,2 \text{ 02}$
 $r = 0,4 \text{ 04}$
 $r = 0,8 \text{ 08}$
 $r = 1,2 \text{ 12}$
 $r = 1,6 \text{ 16}$
 $r = 2,4 \text{ 24}$

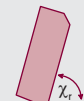
Clearance angle
on wiper edge


$A = 3^\circ$
 $B = 5^\circ$
 $C = 7^\circ$
 $D = 15^\circ$
 $E = 20^\circ$
 $F = 25^\circ$
 $G = 30^\circ$
 $N = 0^\circ$
 $P = 11^\circ$

Z = other clearance
angle

00 for diameters
in the imperial system
converted to mm.

M0 for diameters
in the metric system.

Rake angle χ_r


$A = 45^\circ$
 $D = 60^\circ$
 $E = 75^\circ$
 $F = 85^\circ$
 $P = 90^\circ$

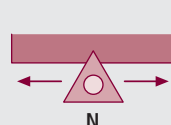
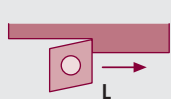
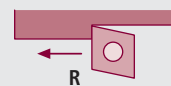
Z = other clearance
angle

8

Cutting edge
shape


9

Advance feed



10

Special
code for
manuf.

One or two-digit codes
(numbers or letters) are selected by manufacturer.
They must be separated from the prior codes by a hyphen (-).

for 5 + 6 Figures after the comma are to be disregarded. In the case of a one-digit code, a lead "0" must be added (e.g. the code for 4.76 mm is 04).
for 8 + 9 Codes 8 and/or 9 are used only if required.

COATING SUMMARY



Description		Colour	Vickers Hardness HV	Maximum Temperature in Centigrade	Type of Coating	Thickness of Coating in μm
PVTi	TiAlN	blue/grey	3600	up to 850°	PVD	2 to 4
PVAT	Modified Titanium-Aluminium-Nitride	metallic/golden	3600	up to 1000°	PVD	2 to 4
PVCC	Titanium-Aluminium-Nitride + lubrication additives	black	800	up to 850°	PVD	2 to 4
PVCN	CrNi	metallic/silver	1800	up to 700°	PVD	2 to 3
PVAS	Special Coating for Aluminium	light grey	2800	up to 700°	PVD	2 to 3
PVDiaN	Diamond-coating, normal	dull grey	10000	up to 600°	CVD	6 to 8
PVDiaG	Diamond-coating, thin	bright grey	10000	up to 700°	CVD	4 to 6
PVSR	-	black	1420 HV30	up to 1000°	CVD	4 to 6,5
PVGM	-	gold	1280 HV30	up to 650°	CVD	2 to 3,5
PVML	TiAlSiN	gold	3300	800° to 850°	PVD	2,5 to 5
PVALSA	TiAlN	blue/grey	3600	up to 950°	PVD	2 to 4
PVFN	PVFN	blue/grey	3300	up to 950°	PVD	2 to 4
PVGO	TiAlN + TiN	yellow/gold	3150	900°	PVD	2 to 4,5
PVTiH	TiAlN Multilayer	violet/brown	3600	up to 1100°	PVD	4 to 5
PVST	AlTiN	blue/grey	3300	up to 950°	PVD	2 to 4

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Material								
	Coatings	Steel	High-temperature Alloys	Stainless Steel	Cast Iron	Non-ferrous Materials	Hardened Steel	
P40	PVTi							Coated very tough standard carbide grade for roughing of steel with medium surface speed and increased tool life.
P40	PVGO							Coated, very tough high performance special carbide grade for pre-finishing and roughing steel, suitable for medium up to high speed values, partial suitable for cutting cast iron and stainless steel.
P40	PVSR							Coated extremely tough special carbide grade for pre-finishing and roughing of steel, with medium surface speed and extremely high feed rates.
P40	PVGM							Coated very tough high performance special carbide grade for pre-finishing and roughing of stainless steel, high temperature alloys and titanium.
P40	PVML							Coated, tough special carbide grade for pre-finishing and roughing steel at medium and high cutting speeds; in part suitable for finishing and for cast iron and stainless steel machining.
P25	PVTi							Coated tough standard carbide grade for pre-finishing and finishing of steel with medium and higher cutting speed and finishing increased tool life.
K10	polished							Uncoated standard carbide grade for medium surface speed for milling of cast iron, non-ferrous-materials and graphite.
K10	PVTi							Coated standard carbide grade for medium surface speed for milling of cast iron, non-ferrous-materials and graphite and increased tool life.
K10	PVDiaN							Diamond-coated standard carbide grade for high-speed finishing of non-ferrous-materials and graphite.
K05	PVTi							Coated standard carbide grade for finishing of steel, hardened steel and steel castings with increased surface speed.
HSC05	PVTi PVTiH							Coated high performance special carbide grade for high-speed finishing of steel, hardened steel and steel castings as well as graphite and plastics.
HSC05								Uncoated, optimized special carbide grade for cutting steel, hardened steel and cast iron for high-speed-applications as well as graphite and plastics.
HSC05	PVFN							Extremely wear resistant special carbide grade for cutting steel, hardened steel and cast iron suitable for high- and very high-speed applications.
MGC	PVTi PVAT PVCC							Coated micrograin carbide for high-speed, high-performance roughing, pre-finishing and finishing of steel, hardened steel, Stainless steel, high-temperature-alloys and Aluminium-alloys.
KAC UKAC	PVCN PVAS PVDiaN PVDiaG							Coated ultra-micrograin and micrograin carbide for high speed, high performance roughing, pre-finishing and finishing of cast iron, non-ferrous materials, graphites and titanium-alloys.
CBN C								CBN-grade for high-speed finishing of cast iron.
CBN S								CBN-grade for high speed finishing of hardened steel over 48 HRC.
PKD								Universal PCD-grade for high speed finishing of non-ferrous-materials and plastics.
UMGC	PVTiH PVAT							Coated ultra-micrograin carbide for high-speed, high-performance roughing, pre-finishing and finishing of steel, hardened steel, stainless steel, and high-temperature alloys.

major application



roughing



pre-finishing



finishing

minor application



roughing



pre-finishing



finishing

TEST REPORT OF CONDITIONS FOR MILLING APPLICATIONS

Company:			Material No.:			Date:								
Street:			DIN Code:			Analysis [%]								
City:			C	Si	Mn	P	S	Cr	Ni	Mo	V	W		
Contact:														
Machine:	HP:	[kW]	N/mm ²			HB			HV			HRC		
Type:	n(s):	[min-1]												
Arbor System:		Vf:	[mm/min]		CNC Control:									
	Test	Actual Status	Test 1			Test 2			Test 3					
Tool	Milling conditions													
	Manufacturer													
	Type													
	Arbor													
	Overhang													
	Kind of cooling (air / water?)													
Cutting Mater.	Kind of cutting material													
	Manufacturer													
	Cutting material code													
	Coating													
Operation Data	V _c [m/min]													
	V _f [mm/min]													
	n(s) [min ⁻¹]													
	D _c [mm]													
	f _z [mm/tooth]													
	a _p [mm]													
	a _e [mm]													
	T [min]													
Results	No. of passes													
	Tool life [min]													
	Life in length [m]													
	Chip volume [cm ³ /min]													
	Energy consumption [kW]													
	Performance evaluation:	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10								
Illustration / Remarks:														

* 1 = very bad, 5 = satisfying, 10 = excellent

FORMULAS AND CALCULATION EXAMPLES

Formulas

Calculation of revolutions of main spindle in [min⁻¹]:*

$$n = \frac{V_c \cdot 1000}{\pi \cdot D_{c/eff}}$$

Calculation of cutting speed in [m/min]:*

$$V_c = \frac{\pi \cdot D_{c/eff} \cdot n}{1000}$$

* Please note: for shallow profiles use true mill diameter to calculate cutting speed (see Surface Finish section).

Calculation of feed per tooth in [mm/tooth]:

$$f_z = \frac{V_f}{n \cdot z}$$

Calculation of machining time in [min]:

$$f_n = z \cdot f_z$$

$$f_n = \frac{V_f}{n}$$

Calculation of feed per min. in [mm/min.]:

$$V_f = n \cdot z \cdot f_z$$

Calculation of machining time in [min]:

$$T = \frac{l_f}{V_f}$$

Calculation of power requirement in [kW]:*

$$P = \frac{a_e \cdot a_p \cdot V_f}{18000}$$

Calculation of chip volume in [cm³/min]:

$$Q = \frac{a_e \cdot a_p \cdot V_f}{1000}$$

* Please note: The formula given for calculating the power requirement is valid for machining steel only.

Definitions:

a_e width of cut [mm]
 a_p depth of cut in [mm]
 D_c cutter diameter in [mm]

D_{eff} true tool diameter in [mm]
 f_z feed per tooth in [mm]
 l_f milling length in [mm]
 f_n feed per revolution in [mm/U]

n revolution in [rpm]
 P power requirement in [kW]
 Q chip volume in [cm³/min]
 T machining time in [min]

V_c cutting speed in [m/min]
 V_f feed per min. in [mm/min]
 z no. of effective teeth

formulas for calculating the true mill cutter-diameter can be found in the Surface Finish selection.

Calculation Example

Milling cutter: 35200
Selected insert: 03 12 840 (P40, PVTi coated)
 (see cutting material table)
Size of insert: diam. 12 x 3,97 mm
Milling cutter diam.: 35 mm
no. of effective teeth: 3
Depth of cut: 1,5 mm
 (see operation data table)
Width of cut: 25 mm
Material to be machined: 1.1730, roughing
Selected cutting speed: $V_c = 250$ m/min
 (see operation data)
Selected feed per tooth: $f_z = 0,6$ mm
 (see operation data)

Calculation of revolutions

$$n = \frac{250 \cdot 1000}{\pi \cdot 35} = 2275 \text{ U/min}$$

Calculation of feed per min.:

$$V_f = 2275 \cdot 3 \cdot 0,6 = 4095 \text{ mm/min}$$

Calculation of chip volume:

$$Q = \frac{(25 \cdot 1,5 \cdot 4095)}{1000} = 154 \text{ cm}^3/\text{min}$$

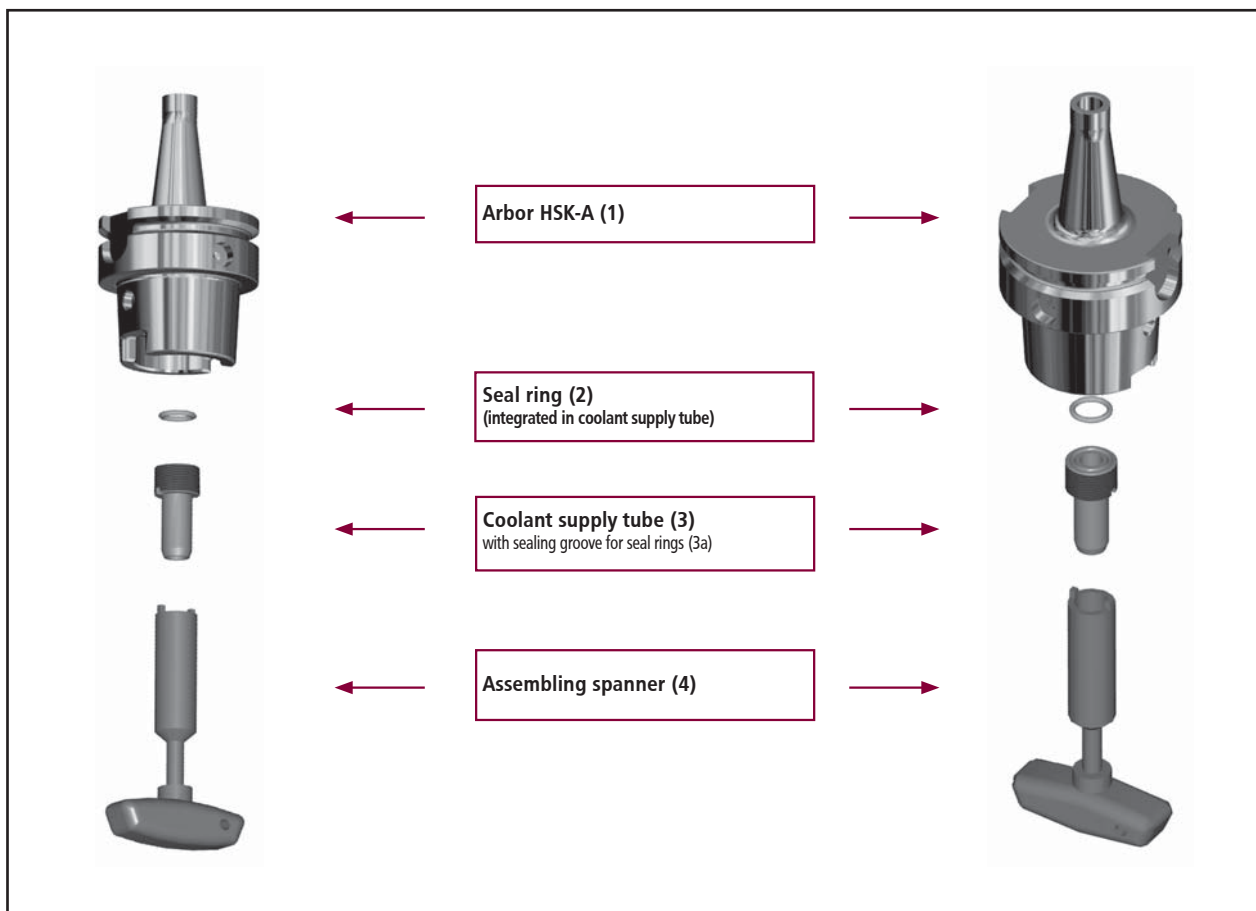
Calculation of power requirement:

$$P = \frac{(25 \cdot 1,5 \cdot 4095)}{18000} = 8,5 \text{ kW}$$

ASSEMBLING INSTRUCTIONS

for Coolant supply tubes for HSK Form A

When using HSK-A arbors with internal coolant supply, it is necessary to assemble these arbors with a coolant supply tube. To assemble, please follow the instructions below. The required accessories are mentioned for every arbor size.



Step 1

Usually, the seal ring (2) is already assembled in the coolant supply tube (3). If it has come loose, please put it back to the sealing groove (3a) of the supply tube (3).

Step 2

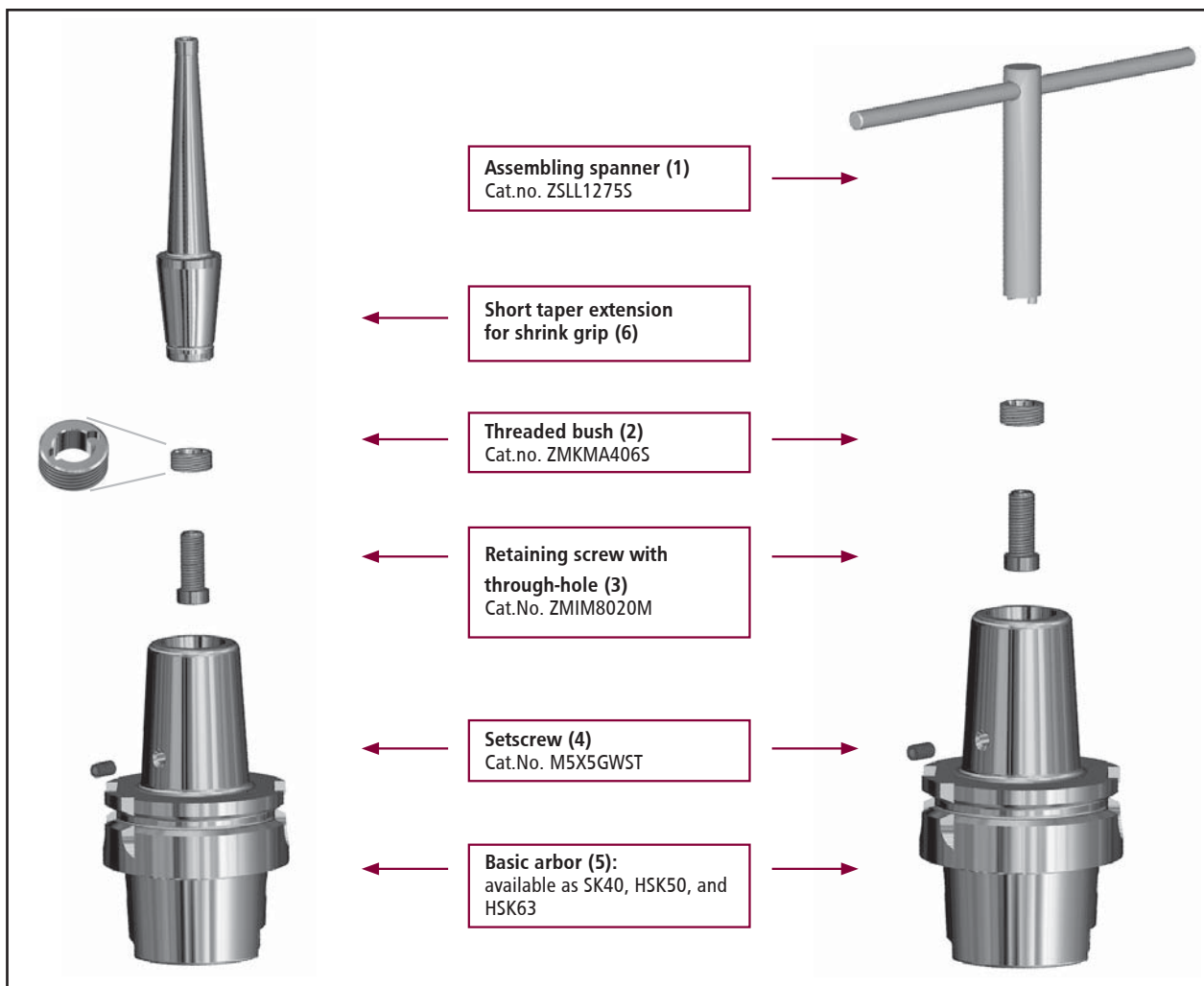
Insert the narrow end of the tube (3) into the spanner (4).

Step 3

Screw the tube (3) into the arbor (1) from the bottom up and make sure that the seal ring (2) is not off-centre or squeezed. Otherwise it loses its sealing function.

ASSEMBLING INSTRUCTIONS

for Pokolm short taper system (KK)



Assembling of extension

The following 5 steps have already been carried out in the shop. In case the unit has to be dismantled (steps 1-5 in reverse order) for technical reasons, please assemble again using the following 5 steps:

Step 1

Stand the arbor (5) upright.

Step 2

Put the threaded bush (2) over the retaining screw (3). Please make sure that the holes for the spanner are on top.

Step 3

Put the retaining screw (3) together with the threaded bush (2) into the arbor (5) (from the top) and tighten it with the spanner (1) (hand tight).

Step 4

Turn the threaded bush (2) back by one quarter of a revolution, so that the retaining screw (3) turns easily.

Step 5

Screw the setscrew (4) into the threaded bore of the arbor (5) in order to fix the threaded bush (2) in its position.

ASSEMBLING AND DISMANTLING INSTRUCTIONS

DuoPlug®

To guarantee optimum results and safe operation of our DuoPlug® system, please follow the instructions below carefully.

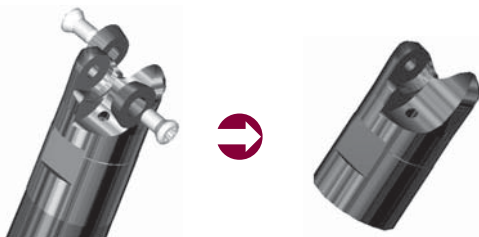
Assembling:

Preparations

Get all the accessories and equipment ready at the workstation before starting heating procedure! (appropriate spanner, safety glasses, protective gloves)

Step 1

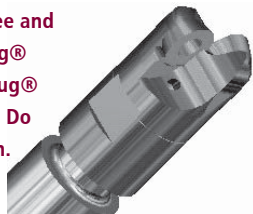
Remove inserts and their screws from the milling cutter body.



Step 2



Attention: All surfaces carrying special fits must be absolutely grease-free and dust-free. Please screw the DuoPlug® milling cutter body onto the DuoPlug® adapter by hand up to the fit zone. Do not use a tool or too much strength.



Step 3

Heat this connection now with the Pokolm Inductive Shrinking Unit TSI 3510 for 6 to 15 seconds, depending on diameter, then start Step 4 immediately.



Attention: Adaptor and milling cutter body are very hot after this process! Danger of burning hands or fingers! Protective gloves MUST be worn!



Step 4

Inductive heating expands the fitted bore in the cutter body. Only then, you can screw the cutter body up to the stopping face of the adapter by the appropriate spanner. This step must be possible without using too much strength. If there is still some resistance, please heat the DuoPlug® cutter body once more for a few seconds and try again.



Step 5



Make sure that the body and adapter fit together perfectly. There should be no gap.

Perform these steps with only moderate strength.



Step 6

Do not shock cool your shrunk combination; use the air-cooling equipment of your Shrinking Unit TSI 3510 to cool it evenly. During cooling, the DuoPlug® cutter body contracts and you get a safe friction locked connection.



Step 7

Mount the desired inserts onto the body with their screws. After checking the diameter and length of your tool, you can start your operation.



Dismantling:

Preparations

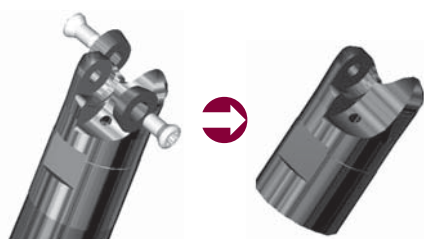
Get all the necessary accessories and equipment together at the workstation before starting heating procedure! (appropriate spanner, safety glasses, protective gloves)



Attention: You absolutely MUST wear your safety glasses when dismantling! Used tools carry swarf and cooling fluid residues which could spray out during operation!

Step 1

Remove inserts and screws from milling cutter body.



Step 2

Heat your used combination with the PokoIm Inductive Shrinking Unit TSI 3510 for 6 to 15 seconds, depending on diameter.



Attention: Adaptor and milling cutter body are still very hot!

Danger of burning hands or fingers! Protective gloves MUST be worn!



Step 3

Inductive heating expands the fitted bore in your cutter body.

Only after heating should you unscrew your cutter body from your adaptor using an appropriate spanner. This step must be possible to perform without strength. If there is still some resistance, please heat the cutter body once more for a few seconds and try again.



Step 4

Do not shock cool your unshrunk dismantled parts; use the air-cooling equipment of your shrinking unit TSI 3510 to cool it slowly, or use the deposit box.



Attention: Adaptor and milling cutter body are still very hot! Danger of burning hands or fingers! Protective gloves MUST be worn!

For further inquiries concerning the DuoPlug® system, please do not hesitate to contact us.

ASSEMBLING INSTRUCTIONS

for Milling cutter bodies with round inserts and shim

In order to maintain optimum and safe use of these tools, you should pay attention to following notice:

Assembling Indexable Inserts

Step 1.1

Remove Torx-screw (5) from cutter body (1) with Torx-screwdriver (7) and check correct fit of threaded bush (3) in threaded bore (A), using provided Allen-key (4).

Step 1.2

Pay attention, that the shoulder of the threaded bush (3) sinks completely into the recess of the shim (2). If not, please fix it with the Allen-key (4).

Step 1.3

Assemble indexable inserts (8) first by means of Torx-screw (5), using Torx-screwdriver (7) and fasten finally with the locking screw (6) in threaded bore (B).

Replace Shim

Step 2.1

For replacing shim, please prepare for Torx-screwdriver (7) and Allen-key (4).

Step 2.2

Unscrew locking screw (6) in threaded bore (B) and after that Torx-screws (5) fixing inserts (8) with Torx-screwdriver (7).

Step 2.3

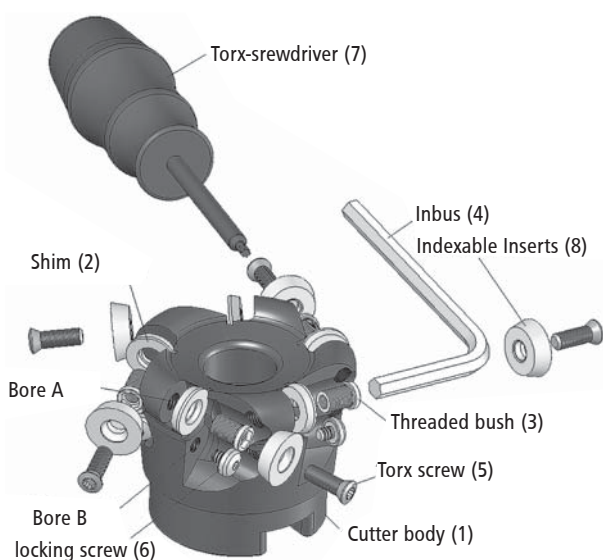
Using Allen-key (4), unscrew and remove threaded bush (3) from threaded bore (A). Remove shim (2) from cutter body (1). Clean insert seat from swarf and grease, before you put new shims back to cutter body.

Step 2.4

Put new shims (2) into insert seats and fix it into threaded bore (A) with threaded bush (3) using Allen-key (4) and copper paste from our accessories selection. Pay attention, that the shoulder of the threaded bush (3) sinks completely into the recess of the shims (2).

Step 2.5

Now, indexable inserts (8) can be fixed as usually, using Torx-screws (5) and Torx-screwdriver (7). Finally, fasten locking screw (6) for secure insert fixing into threaded bore (B).



ASSEMBLING INSTRUCTIONS

for set-screw for Mirroworx® and Baseworx®

In order to maintain optimum and safe use of these tools, you should pay attention to following notice if you assemble set-screws GWSTPS81SK:

Assembling set-screw:

Step 1

Screw set-screw into cutter body up to limit-stop contact. This is guaranteed for every tool in Pokolm's warehouse. In rare exceptional cases, this set-screw can become unfastened during transport. In that case, the set-screw has to be re-adjusted prior to usage.

Step 2

For assembling, put milling cutter body on to arbor. Make sure, there is a remaining gap of 4 mm between milling cutter body and arbor. (this is guaranteed, when using genuine Pokolm-arbors).

Step 3

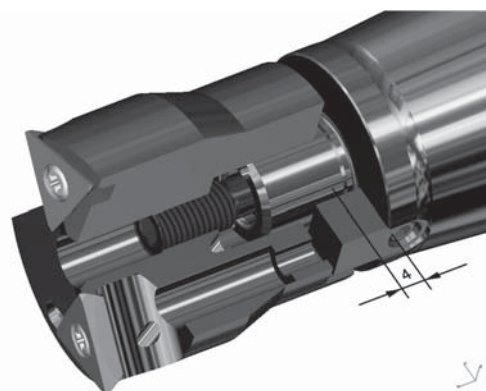
Now, please screw the set-screw into the arbor uniformly, until there is no remaining gap between arbor and milling cutter body by using an Allen-key 5 mm opening.

Step 4

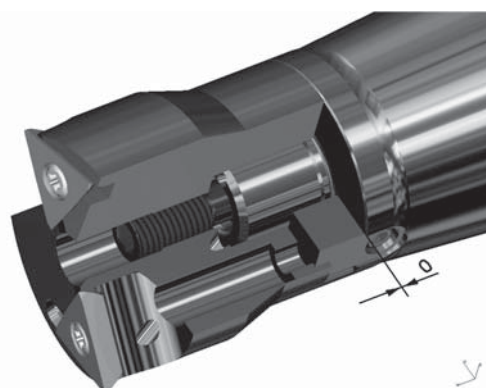
If, beyond expectations, a gap remains, please dismantle your cutter body from the arbor. Unscrew the set-screw by ½ revolution. Continue with step 2.



Please consider:
Maximum torque = 10 Nm



Step 1 and 2



Step 3 and 4

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If you have any further question regarding Mirroworx®- and Baseworx®- please do not hesitate to contact us.

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(please copy prior to completion)



Please fax to:

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VOHA: +49 2266 4781-40

You can of course also place your order
with one of our applications engineers.

Catalogue no.	Description of item	Quantity	Price per item	Total price
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Department:

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Our terms of sale are valid for this faxed purchase order.

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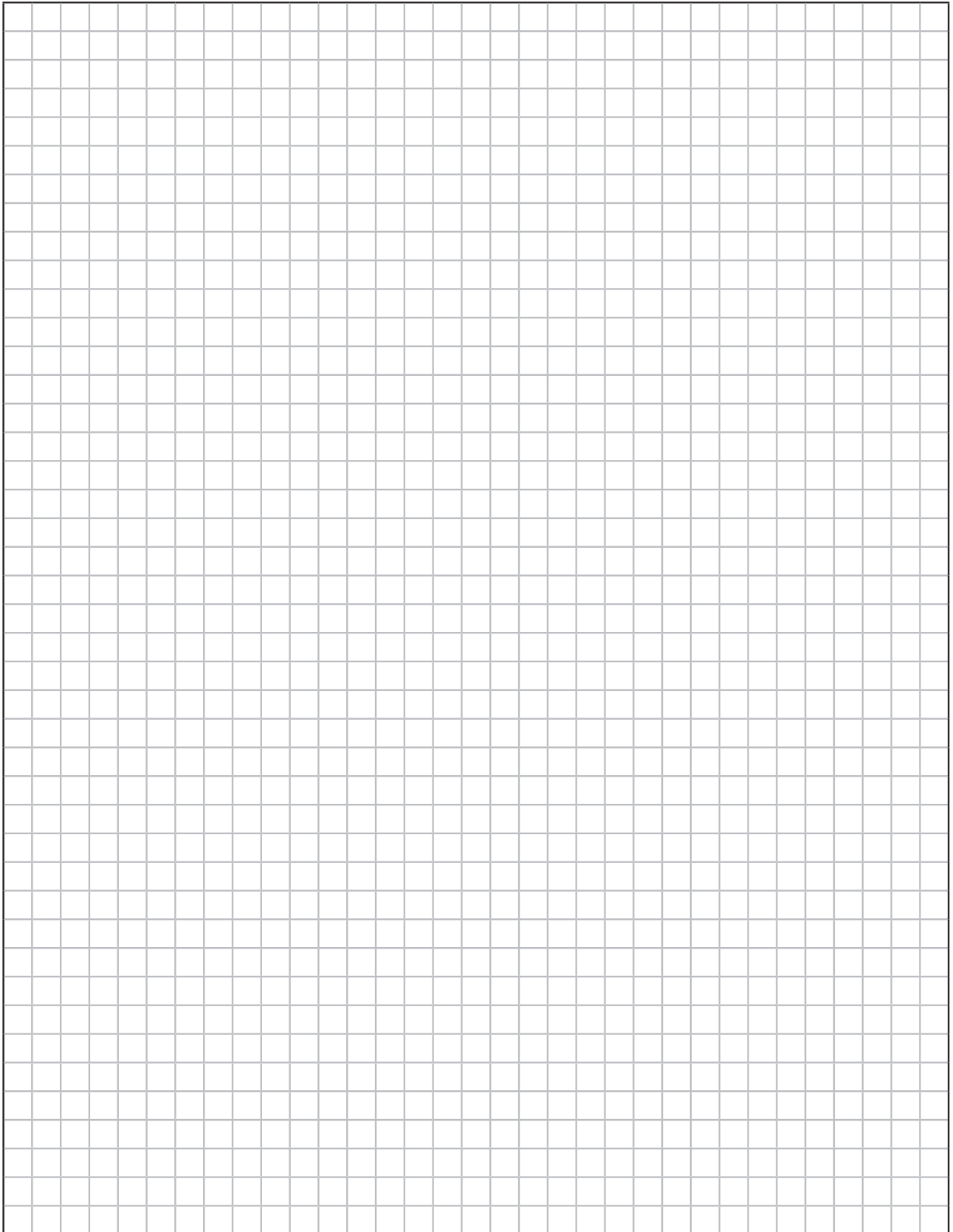
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NOTES



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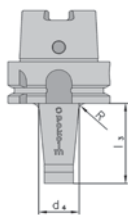
Threaded shank end mill bodies in mm:

Thread size	M 5	M 8	M 10	M 12	M 16
Fit zone in mm	5,5	8,5	10,5	12,5	17,0
Starting torque in Nm	7	15	30	50	100

Thread sizes for Shell-type arbors:

Pilot diameter in mm	16	22	27	32	40
Fixing screw	M 8	M 10	M 12	M 16	M 20

Remark about Arbor dimensions d4 and l3:

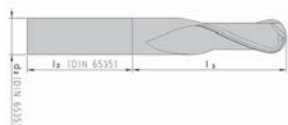


The arbor dimensions d4 and l3 (see illustration at left) are calculated up to the theoretical point of intersection between arbor taper and collar. Please take the radius R (5-8 mm depending on arbor type) into account for practical use.

Tolerances for Solid carbide end mills:

d_1	d_2	r
h_8	h_6	f_8

Theoretical usable end mill length of Solid carbide end mills in mm*:



diam. of shank (DIN 6535) d2 h6	2 - 5	6 + 8	10	12 + 14	16 + 18
length of shank (DIN 6535) l2 $\begin{smallmatrix} +2 \\ -0 \end{smallmatrix}$	28	36	40	45	48
diam. of shank (DIN 6535) d2 h6	20	25	32 + 36		
length of shank (DIN 6535) l2 $\begin{smallmatrix} +2 \\ -0 \end{smallmatrix}$	50	56	60		

* this usable length appears through deduction of the DIN-shank-length (l2 according to DIN 6535) from the overall length l1 of the end mill or of the solid carbide adapters. See table above.

Features:

	toric tool		incorporated insert		arbors with zero reach
	7° positive axial rake angle		clamping flat		DuoPlug®
	12° positive axial rake angle		concave moulding		shim
	17° positive axial rake angle		working depth		internal coolant supply
	Solid Carbide		suitable for high-speed machining		especially suitable f. non-ferrous materials
	chamfer		wet machining possible		on request
	2-point contact milling		dry machining possible		stock item, subject to confirmation
	wet machining required		for direct spindle mounting		available as long as stock lasts
	dry machining required		long series		new item
	balance grade		dense antivibration material		stainless- acid- and heat resistant

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